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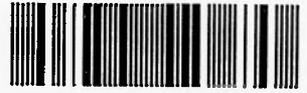
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**Rural Resources Management Group
Rural Poverty and Resources Research
Programme**

**INTENSIFICATION, ENTITLEMENTS AND ENVIRONMENTS.
INTENSIFICATION OF NATURAL RESOURCE MANAGEMENT IN
DIFFICULT AND FAVOURABLE AREAS**

Concepts and a Framework

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**RPRRP
Working Paper No 1**

June 1993

Funded by Natural Resources and Environment Department, ODA

**INTENSIFICATION, ENTITLEMENTS AND ENVIRONMENTS.
INTENSIFICATION OF NATURAL RESOURCE MANAGEMENT
IN DIFFICULT AND FAVOURABLE AREAS:
*concepts and a framework***

Introduction

The purpose of this paper is to outline a series of themes and ideas that might be considered as network specific papers are prepared for Part 1a of the Unifying Theme (UT) on the dynamics of natural resource intensification. The intention is to give these papers a shared lexicon and set of foci. It is also expected that in the course of the preparation of those papers the ideas in this paper will be adapted. These ideas are not then intended to be a straitjacket but a starting point.

The paper runs through a number of themes that then lead us to a very broad framework in Figure 1 that might be used to structure the analyses of the Network specific papers. We then close with a few reflections on how questions of policy might be treated in papers for Part 1a.

The nature of natural resource intensification

Much ink, and probably some blood, has been spilled in trying to define and determine how to measure intensification in natural resource management. Some measures are input based (e.g. increased use of capital, or manure), others are output based (e.g. increased food production per hectare). Some are measures per unit space (e.g. tonnes per hectare), others per unit time (e.g. fallowing frequency).¹

Each measure has its advantages and disadvantages. The unifying theme should not get sidetracked by the question of measurement. In one sense it is tempting to say "you will know intensification when you see it" but that is too cavalier. But we can draw on a synthesis of several the different approaches to intensification.

¹ Measures of intensification are discussed in Turner and Brush (1987: chapter 1), and Turner and Doolittle (1978).

Given that we are interested in intensification as a means to an ends (the creation of more sustainable livelihoods) rather than as a means of increasing the use of a particular input, then it is more appropriate for us to concentrate on the intensification of output. Output, however, can be measured in a range of ways: weight, calorific value, dry matter content, cash value etc. The most appropriate measure is that which is most consistent with the concerns of the resource users being considered - and this maybe a composite of food and cash value (Turner and Brush, 1987). This output should be assessed per unit space per unit time (e.g. /ha p.a.).

In addition, it is important to bear in mind that intensification is not a one way process. There are many experiences of disintensification in contemporary and archaeological records. Nor does it occur along a steadily increasing trendline: rather intensification is a stepped process (Boserup, 1965; Robinson and Schutjer, 1984). There are therefore discontinuities in the process of intensification, and intensification cannot occur unless certain preconditions and changes in real (or perceived) costs and benefits to intensification occur.

Finally, and this is most important, intensification is ultimately a phenomenon occurring at the level of the individual household, and actors within that household. Thus while area based figures may suggest intensification, this does not imply that all households are intensifying at the same rate (or at all). Indeed, the intensification of some, may be at the expense of the disintensification of others - as for instance when some farmers begin using machinery because they have been able to acquire land from others who have been forced to sell (for whatever reason) and so become landless. Thus, as we discuss intensification we must constantly bear in mind the different levels at which it is measured (household and region), and the constant interaction between and within these different levels. This brings us to the theme of the next section.

Intensification and entitlements

The case for interventions to promote intensification in the use of renewable natural resources is a strong one - some would say it is overwhelmingly convincing.

Against the reality of population growth rates in developing countries of 1-4 percent is the historical precedent that food supply has never grown in sustainable fashion at rates over 2.5 percent (Pingali & Binswanger, 1988:72). Farmers may have found indigenous means to intensify in the past, responding to slowly increasing levels of demand (Boserup, 1965; Richards, 1985, 86). But current projections of demand growth imply to some that indigenous innovations cannot be enough. Something, it would seem, has to be done. Usually, the something recommended is the modernisation of technology, the application of science and the creation of human capital (farmer education) to increase farmer capacity to manage the increasingly complicated technologies emerging - or that would be expected to emerge - from this application of science.

However, to intensify is not necessarily to alleviate poverty. As Sen (1981) has argued, the availability of food will not address hunger unless the hungry have entitlements that they can enforce in order to ensure that they have access to that food. Those entitlements might be ensured through ownership (they produce the food), purchasing power (they have money to buy the food), civil rights (they make claims of food security on the state) and other such mechanisms.²

Intensification to address poverty therefore must be an intensification with entitlements.

Present generations are not, however, the only generation with entitlements. Future generations also have entitlements (Talbot Page, 1977) - they are the least able to demand those entitlements however. To guarantee their entitlement, the means to produce food and income for those generations must also be guaranteed.

² It is via this theme of the enforcement of entitlements that the theme of this paper (and of Part 1a of the UT research) links to the theme of Part of the UT which discusses the issue of how institutions can be made more responsive to demands voiced by the rural poor.

Thus, intensification must come with guaranteed entitlements for today's and tomorrow's generations. This is what we are really talking about when we talk of sustainable development.³

If our interest is poverty alleviating intensification we must look at intensification in these ways. We must know who intensifies (as much a spatial as a social question)⁴, who gains the benefits of intensification and how it influences the current distribution of entitlements, and how intensification in one place and time influences the entitlements of other groups in space and time.

This implies that we cannot talk about intensification out of social context. It is that context that will determine the answers to these questions (Goldman, 1992; Kates and Haarman, 1992; Turner and Brush, 1987). Given that, it is also less helpful to talk about the potentials of science and technology in the abstract: a heavy investment in science may develop technologies that allow food production to rise at 4 per cent a year, but this will not ensure that the 4 per cent per annum increase in population is able to eat the fruit of that application of science - now or in the next generation. A range of factors can lead to such a situation: obstacles in access to this production; lack of rights to demand access; economic policies that promote wastage; the power of some to accumulate the benefits of the production etc. It is therefore important to look at past experiences of intensification - for there we will be able to assess the interactions between aggregate production and the social distribution of the benefits deriving from this production. These experiences may in turn point us to the types of intensification and the types of social context that are more likely to lead to enhanced security and sustainability in the livelihoods of the poor.

Stimuli to intensification: demand and entitlements

³ The livelihoods that are to be sustained are thus inter-generational. Although this is to preempt the issue, the inability of unborn generations to protect their entitlements for themselves (in Albert Hirshmann's terms they have no voice) suggests an important, though rarely mentioned role for the state and legislation in promoting sustainable livelihood development.

⁴ This is so because, as will be discussed, it is clear that patterns of intensification have been influenced by distance from roads and markets, micro-spatial variation in environmental characteristics, regional variations in agroecological characteristics, and the key question of who controls those environments and places that are more likely to be able to intensify production.

Intensification (or disintensification for that matter) is a response to changes in demand. This is the essence of the Boserup argument (1965). As population increases, she argued, so resource management practice responds to the increased number of mouths: technological innovations occur at the point where existing resource management could not satisfy demand without a technological change.

The argument, essentially an anglophone version of Chayanov's work in the first two decades of the century, continues to influence cutting edge current thought (Kates, et al., forthcoming). However, it needs unpacking in several respects: we cannot assume the relevant technology exists, we cannot assume that even if it does all resource users will be able to use it, and we cannot conflate the number of mouths with effective demand. The first two points are dealt with in following sections. Here we concentrate on the issue of demand.

Demand is much more than subsistence, and subsistence need is not always demand. While early formulations such as Boserup's and Chayanov's essentially equated demand and population density, subsequent work in Melanesia (Brookfield, 1972) showed that land use intensity can change in response to changes in other demands for products: for ritual purposes, for taxation, and for enforced income transfers between social groups.

This still presupposed a largely subsistence production rationale: production for immediate and basic storage needs. Once however resource user rationalities become more capitalistic, an additional pressure to intensify comes from the desire to accumulate surplus. The involvement in market exchange relations adds a further complication to intensification responses. The goal of resource use change ceases to be to increase calorie production per unit area, and rather becomes the optimization of a range of assets whose final exchange value will maximize the utility of the family - within certain desired levels of security (Brush and Turner, 1987).

Resource intensification and livelihood intensification

These demands can be satisfied from different sources: not only natural resource intensification. Off-farm labouring is the most obvious different source, and indeed work suggests that this income source is already important for many rural families. Thus a response to a pressure to intensify may not be to increase intensity of NR use, but rather to diversify sources of income, to 'intensify' income in general. Indeed, in some cases, the response may be to disintensify resource use in order to put more time into other sources of livelihood intensification. The ultimate disintensification is permanent out-migration, and in a number of countries absolute rural population is beginning to decline, raising new challenges and questions for natural resource policy.

Recognising that NR intensification is simply an element of a broader concern of resource users to intensify income, has a range of implications for intensification and resource management:

- a) whether an increase in demand leads to intensification will be influenced by the possibilities open to the resource user in other markets. The Eucalyptus boom in India during the 1980s was a response to many factors, but an important one for many farmers was the desire to grow a profitable crop on lower value land with fewer and cheaper paid labour inputs than foodcrop production had demanded. Disintensifying freed time that the farmers previously spent in supervising labourers, and made it easier for them to pursue urban income opportunities;
- b) changes in the relative structure of crop prices and wages may lead to a pressure to intensify without any increase in demand. For instance, field observation and informal information sources suggest that a recent tendency to instal terraces in the Central Andes of Ecuador reflects a tightening of urban labour markets for rural migrants rather than any increase in demand for local food production or any sudden realisation among farmers of the virtues of terraces;

- c) changes in perceptions of the actual and potential relative structure of prices and wages may also lead to a pressure to intensify without any increase in demand. Thus if new experiences lead farmers to increase their estimates of the potential returns to land transformation and resource recuperation, they may begin intensifying (if this increase justifies the opportunity costs involved). The recent recuperation of land in the Mossi plateau is a case in point, where farmers appear to have been convinced that installing diguettes may lead to yield increases that justify the diversion of labour time from migration to NR management (Batterbury, 1993);
- d) income from migrant and off-farm labouring may be a resource that enables intensification - either as remittances or as savings for a large investment. Much of the land-use intensification happening in Machakos (Tiffen and Mortimore 1992) has been made possible in this way.
- e) the decision to participate in off-farm and migrant employment takes people out of daily contact with resources. This may have implications for the erosion of knowledge, thus narrowing the knowledge base available for future intensification. More definitely it will reduce the amount of casual field maintenance of any land transformations⁵ that constitute an intensification (e.g. terraces, drainage and irrigation channels, raised beds). (see Doolittle, 1984; Treacy, 1989).
- f) If off-farm work consistently offers a more appropriate response to increased demand than NR intensification, then resource users are less likely to see their future as revolving around land management - thus reducing further the likelihood of investments for intensification on the plots which they own. On the other hand, this may allow others to intensify the NR contribution to their livelihoods if those who disintensify sell land - allowing wealthier farmers to consolidate holdings and mechanize - or sub-

⁵ These transformations are what Blaikie and Brookfield (1987) call "landesque capital."

let or sharecrop their land - giving the landless access to NR based livelihoods and perhaps a first step toward capital accumulation.⁶

Responses to intensification pressures must therefore be seen in the light of the wider livelihood strategies of the rural poor. NR intensification may not always be the most effective, nor the most likely response of farmers. Thus, in certain contexts and for certain groups, policies and programmes aiming to promote intensification may simply be a waste of effort.

On the other hand, intensification may be more effectively supported by policies that do not deal directly with natural resources, but which, for instance, influence rural-urban terms of trade in favour of farmers so as to increase the incentive to intensify - and so as to increase the income at their disposal with which they can finance the intensification (as formalised in Robinson and Schutjer, 1984). There are experiences of intensified land use in the Ecuadorian Andes and Bolivia (Bebbington et al, 1993) which suggest that sustainable intensification of what are by any measure fragile lands has been made possible primarily by interventions in the local economy - in processing, pricing etc - that enhance farmer income, and so increase the ability and desire to incorporate new, or more intensive, resource management technologies. Indeed, in Latin America a new body of thought is emerging in those institutions that have long since endorsed pro-poor rural development strategies, in which one important means of peasant development in the future will be to develop mechanisms allowing peasant producers to take advantage of higher value product markets through processing of peasant products.⁷

Intensification of livelihoods or poverty alleviation?

⁶ The literature on sharecropping and tenancy is often highly critical of such landholding relationships - especially the literature deriving from South Asia. However, there are other cases where the sub-letting or sharecropping of land has been for landless or land scarce families the first step towards capital accumulation (Lehmann, 1986).

⁷ Institutions such as the Inter-American Institute for Agricultural Cooperation (IICA).

These comments on livelihood intensification bring us to a further observation. While the proposal for the UT research - and indeed many project documents - talk of poverty alleviation as an objective of NR interventions, it is suggested here that we ought not think of poverty alleviation as a goal *per se*: poverty is very difficult to define, and alleviation always sounds temporary and short-term. Rather our interest should be in supporting livelihoods that are more sustainable and that generate higher benefits for resource users.

In many cases, the diversification of income sources is an important component of this greater sustainability, and such diversification can be built by a combination of national level policy initiatives (such as land tenure changes which encourage investment), local programmes which offer easier access to opportunities for modest capital accumulation through provision of seedlings or livestock, and the creation of marketing opportunities previously absent by the judicious location of processing points (for forest, agricultural and livestock products).

Intensification, environments and technologies

The form taken by the resource user's response to different stimuli to intensify or disintensify will also be influenced by the nature of the bio-physical environment, the technologies available and the existence of social mechanisms allowing access to and use of such technologies.

Whilst not wanting to foster an agroecological conception of difficult and favourable (see below) it is the case that biophysical conditions influence the nature of resource user response. For instance, among other things biophysical conditions affect:

- * the constraints and opportunities for production
- * the investment costs implied for intensifications
- * the potential benefits to intensification
- * the risks associated with intensification

- * the locales in which intensification and disintensification are likely to occur (reflecting spatial patchiness in local conditions)
- * the mutual interrelationship of intensification and disintensification, where rational planning leads to the grouping of available resources at one site at the expense of others
- * the temporal interrelationship of intensification and disintensification, as in a fallowing cycle, or over the course of the household's developmental cycle

The costs and benefits of intensification in particular environments influences the likelihood of intensification. In many cases where costs are very high because intensification requires a transformation of the landscape, benefits are also high. This creates a situation in which intensification is clearly a stepped process. When the costs of intensification are very high, resource users avoid it as long as possible until there is no choice. The critical context may also, however, be the enabling factor in the case of intensifications that require a large population, as in the conversion of Andean highland lake sides into raised fields (Erickson and Candler, 1989); the conversion of swamps to padi rice in Sierra Leone (Pingali and Binswanger, 1988; Richards, 1985); and the terracing of slopes. Furthermore, this intensification may then reduce degradational pressures on other lands - as in the case of raised field in the Andes, whose intensive cultivation allowed reconversion of land use on slopes from crops to pastures.

Whether, and the point at which, this step occurs is influenced by a range of non-environmental factors. Market linkages (see above) and social organisation are particular influential. Raised fields and irrigation systems require social mechanisms to allow the coordination of labour at the point of installation, and then social mechanisms to allow the maintenance and functioning of the innovation.

Thus when these social mechanisms or market linkages or other external factors change, so the intensification may cease to be sustainable. The steps are therefore reversible. (see Annex 1). Many terraces and hill irrigation systems are now abandoned at more distant places from settlements because of outmigration. A weakening of community mechanisms to regulate resource use can also lead to such abandonment.

Interestingly, in a review of recent studies of land use on purported fragile lands (Turner and Benjamin, 1991) pointed to the strength of local organisations and institutions as an important positive factor in enhancing the likelihood that intensification on fragile lands will be sustainable.

What makes a difficult and favourable environment? the social context of perceived environments

Earlier on we said we wanted to avoid an agroecological definition of difficult and favourable environments. While some agroecological factors imply more of a challenge to livelihoods than others, they are not determinate. Rather we would argue that whether an area is "difficult" or "favourable" is an effect of prior social and environmental processes. "Difficult" or "favourable" are not inherent characteristics.

Indeed, the social context in which an environment is managed may determine whether the same environment is perceived as favourable or difficult. The same area can thus be difficult and favourable at the same time for different people.

Three examples help demonstrate this important point. Irrigation projects for commercial rice production in the Gambia meant that land that was traditionally used for food crop production and was therefore by definition controlled by women, was transformed into land with the potential for commercial rice cropping. Land for such cash crops is typically controlled by men in the region. Ultimately, drawing on cultural norms and political power men gained access to this land (Carney, 1988). This was therefore a difficult area for women who were - for political and cultural reasons - unable to intensify or even sustain production on the land. Conversely, it was clearly a favourable area for men.

Recent work at Pakhribas Agricultural Centre has shown that whether so-called "red soils" are favourable or difficult depends on who you are. Agricultural researchers have long assumed that red soils are difficult and are therefore where the poor are concentrated. Field research has shown that in fact wealthier farmers also occupy lands

with this soil type and see it as very desirable: when ploughed deeply it becomes highly productive and well drained. For poor farmers, without resources to plough, it remains difficult, hard-capped and unproductive (C. Turton, pers. com., 1993). Finally, areas abandoned by one economic group as too difficult, can be eagerly colonised by another whose previous situation was even worse. (E.g. the immigrants from Chad who took up residence in parts of the Western Sudan abandoned as too dry by Darfuri inhabitants.

The implication is that it is not helpful to talk of, say, irrigated environments as inherently favourable. They are clearly not for the landless who occupy them.

All these examples show that environments are perceived in different ways by different people according to a range of socio-cultural, political, economic, and agroecological factors. Furthermore, how people are able to use them depends on the socio-economic context within which the individual manages the environment. By implication, the intensifying or disintensifying response of that resource user to pressures to change will be influenced by these same factors (Goldman, 1992; Cain and Nicholls, 1992 in Lee, 1988).

This differential capacity to respond and to use the environment provides a pointer to one dimension that differentiates difficult and favourable environments: favourable environments are those in which the resource user has more options for how to use the environment and how to respond to pressures on production. Choices will be increased when access to information, secure tenure, credit, new markets, political decision making are all increased for the group in question.

Interactions between difficult and favoured environments

If we argue in this way that social context is a key factor in determining whether an environment is favourable or difficult, then it is evident that there are acute interactions between processes of change in favourable and difficult areas. This is so both on micro and wider scales.

If the same locality is difficult for land scarce people and not for other land rich people, then the poverty of the land scarce can easily lead to pressures for theft, petty violence and ultimately occupation of the land of the wealthy. If successful, such occupation immediately converts the environment into a difficult one for the formerly land rich also. Conversely, if in a similar situation agricultural credit policies favour those who are already favoured, then this can make the environment even more difficult for the unfavoured - the stereotypical experience of the Green Revolution. This can both aggravate poverty and ultimately lead to a backlash of protest and violence from the unfavoured.

On a wider scale, as difficult areas are unable to sustain livelihoods of new adults, outmigration can lead to resource conflicts in other, favourable or difficult areas. Similarly, in extreme circumstances, this outmigration and general neglect of the livelihoods of people in difficult areas can lead to regional or national security problems: urban violence, regional violence etc. These in turn are disincentives to investment and intensification in general, disturb markets and food entitlements and so forth (Sudan; Peru; Central America).

The case for deciding on policies to support intensification in difficult areas should then not rest only on the in situ pay-offs to that action, but also to the knock on effects in favourable areas if difficult areas are neglected.

The dynamics of intensification and disintensification: a framework for analysis

From these comments it is clear that to understand intensification and disintensification we need to understand:

- the stimuli that elicit this response (pressures stimulating changes in resource use intensity)
- the factors that structure the nature of this response, and the ways in which the relevance of these factors are differentiated socially
- the social distribution of the response (who responds)
- the social differentiation in the nature of this response (who responds how)
- the impacts of the response
- the social and temporal differentiation of these impacts: who bears what benefits and costs, and when (including the less obvious, but also relevant, intergenerational issues; urban rural issues).
- the interactions between different peoples' responses

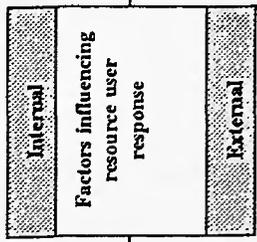
Figure 1 is an attempt to capture some of these relationships.

FIGURE 1.

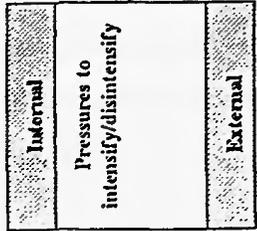
- e.g.
- labor availability
 - knowledge availability
 - expectations + obligations

- e.g.
- land rights
 - gendered control of resources

- population increase
- household dynamics



- e.g.
- land legislation
 - access to institutions
 - market access



- e.g.
- change in price structures
 - labour markets
 - market integration
 - project intervention

Social differentiation in response patterns

by group:

- gender
- ethnic group
- socioeconomic status

by level:

- household
- community
- region

Intensification
resource management livelihood

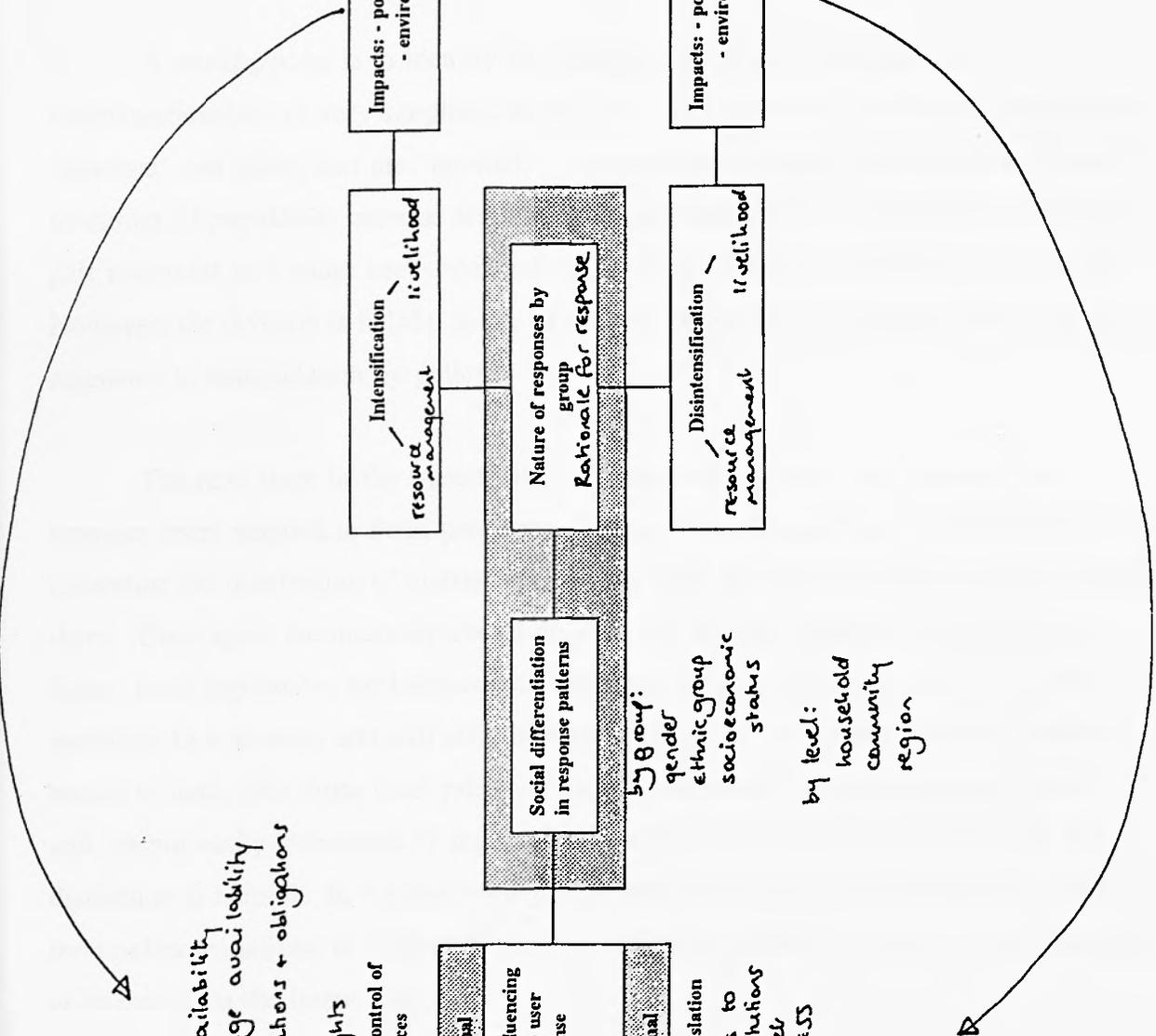
Nature of responses by group
Rationale for response

Disintensification
resource management livelihood

Impacts: - poverty
- environment

Impacts: - poverty
- environment

x Interactions
x Determining factors



In simple terms the framework gives us a structure with which to unpick the interactions and factors that influence the intensification process, its dynamics and impacts. The different steps in the framework may then give us a structure for the Network specific papers.

A starting point is to identify the pressures that lead to intensification and disintensification. In very simplistic terms these can be divided into factors that are more "external" and others that are "internal." Of course the division is an oversimplification: dynamics of population increase are based on individual decisions which themselves are in part responses to a wider socio-economic and institutional environment (Cowgill, 1975). However, the division is helpful to the extent that in general the external factors are more amenable to manipulation by policy.

The next stage in the framework is to unpick the factors that influence how resource users respond to these pressures. These are the factors that, among other things, determine the distribution of entitlements among rural people and their capacity to exercise them. Once again the internal/external division can be used, although once again also false. Land legislation, for instance will influence the distribution of rights and land securities in a locality, and will also have an influence on local rules regarding rights of access to land. But those local rules are not fully dependent on national land legislation, and are not easily influenced by legislation. They are thus more "internal" and so the distinction is helpful. In a broad sense the external factors are more amenable to *short term* policy initiatives, and the *long term* effect of those policies will be to have some type of influence on the internal factors.

Having unpicked these factors, we can then say something about the factors in the first two stages interact to determine who responds (special differentiation in response patterns), how they respond (nature of response), and why they respond in the way they do (the rationale of the response). This is essential if we are to make any response consistent with and appropriate to the motivations underlying resource users current livelihood strategies (c.f Chambers, 1987).

This stage of our discussions is also where we can identify the types of interaction that deny the rural poor the opportunity to intensify their livelihoods (be this through NR intensification or other forms of livelihood intensification), and those that allow this to occur.

Following this stage, we need also to analyse the impacts of that intensification or disintensification. Two areas of impact are noted in the Figure: the impacts of the response on patterns of poverty, and on the biophysical environment. Aside from describing the types of impact, it will be necessary to: (i) understand how the different impacts are inter-related (as in the above noted case of interactions between intensification on flatter lands and disintensification on adjacent slopes); and (ii) what factors determine the impacts. Once again these will bring us back to the question of entitlements: what factors determine the ability of the rural poor to benefit from processes of intensification and disintensification.

Policy implications

While part II of the unifying theme research concentrates on questions of institutional and policy design, part 1a proposes to *identify* issues that need to be addressed by natural resources policy, and "identify types of policy initiative that will enhance the resource management and livelihood strategies of the rural poor" (RRMG, 1993:4). The framework should provide a structure to help identify these issues. As noted, we have tried to suggest that the division of factors into the two categories helps identify those that are more amenable to policy manipulation.

How far NR policy can address these issues depends on how broadly we are willing to define NR policy. Is policy that affects rights of access to natural resources NR policy? If so then we might identify issues for land tenure reform, or for legislation related to the gendering of access to resources etc. It is probably the case that we should embrace a relatively broad idea of NR policy, for straight technology and infrastructural development policies will have little to offer in addressing many of the factors that influence who intensifies and how.

It is premature to suggest where NR policy may have more to offer: it may influence pressures to intensify, factors affecting resource user response, factors affecting the impact of that response and who benefits from it and who loses. However, it is possible that the most obvious contribution of a poverty alleviating NR policy will be in removing constraints to those types of intensification whose benefits flow to the rural poor.

It might also be argued that the issues that emerge for NR policy may not only be restricted to simple implementation. In some cases the issue emerging for NR policy may be that NR policy makers need to think and investigate much more carefully before they do anything at all. This may be particularly the case where systems are so intensified and complex that any one intervention will have a range of knock on effects that are difficult to predict without detailed knowledge of the context.

Thus, if policy initiatives are to be identified these need not be only initiatives that lead to project interventions. Initiatives may include:

- * efforts to create more "enabling" environments - such as guarantees of land rights to the rural poor;
- * efforts to make NR policy makers more cognizant of interventions in other parts of the rural (and national) economy - such as the coordination of NR initiatives with other employment generation initiatives; (to avoid, for instance the situation which occurred in rural India when village common-lands were being planted up with trees under social forestry at the same time as pro-poor policies were allocating cows to the landless - for which they would need the commons as grazing areas.)
- * initiatives to change incentives to resource users. Obvious examples would be agricultural pricing policies removing subsidies on food prices and therefore giving incentives to engage in more sustainable forms of intensification; or the removal of

land laws in forested areas which grant tenure to land-clearers rather than to those who protect and use standing forest.

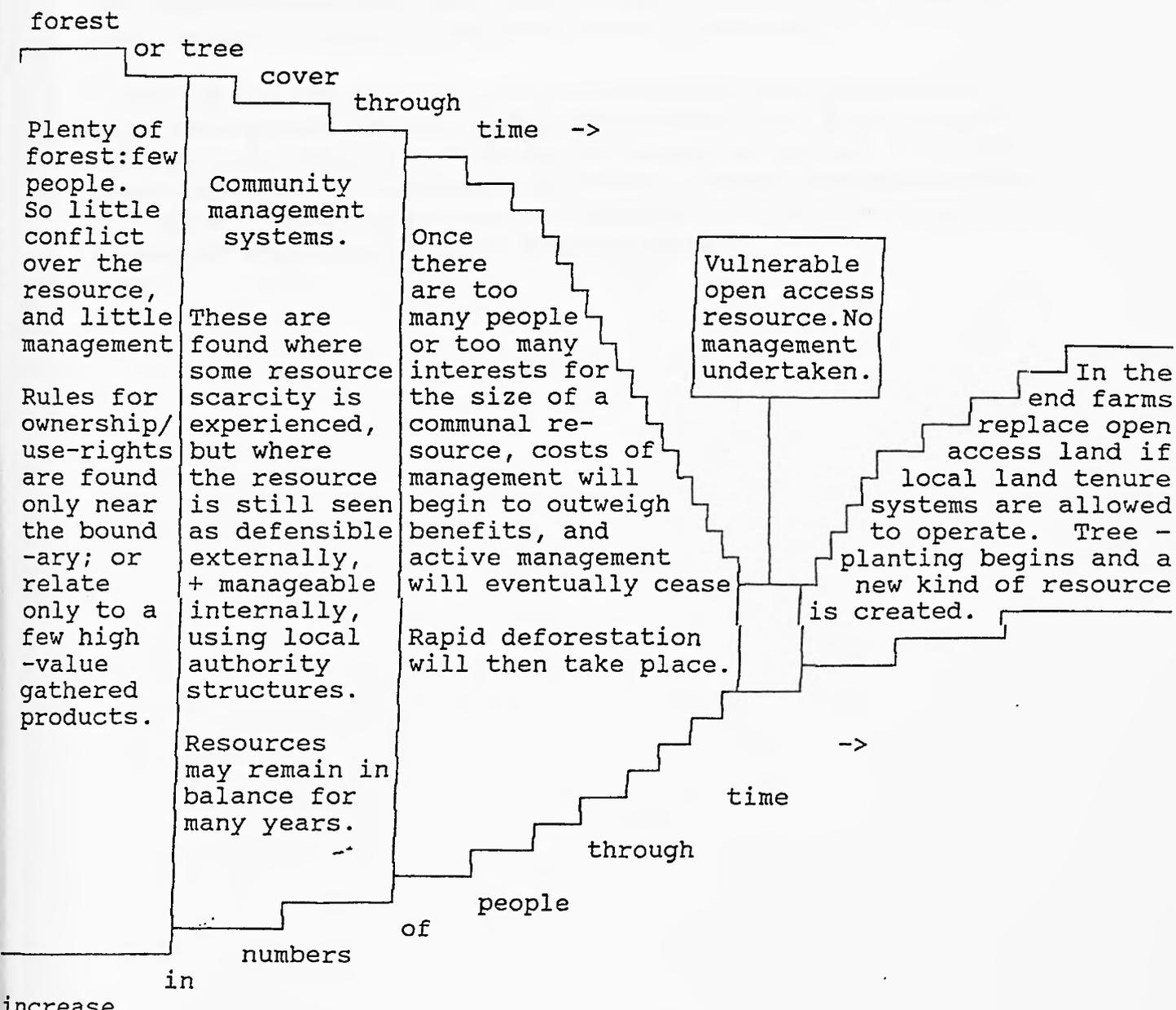
- * initiatives to discover how some farmers have already adapted to new constraints and to make sure their independent innovations are known to others and (if appropriate) are supported by government. For instance, some farmers in central Nigeria have adapted to shortages of spare parts for farm machinery by reverting to animal traction. They have done so by 'importing' camels from the north rather than using cattle, a response that has a rationale that has relevant implications for policy. Camels cannot live a full life-span or reproduce when they are outside their own drier environment, but they are much stronger plough animals than oxen, can plough before the start of the rainy season when cattle are often weak and out of condition, and are a replaceable 'import' which does not call for hard currency.

Finally, given the dynamic inter-relationship between favoured and difficult environments, it should be stressed that the case for deciding on policies to support intensification in difficult areas should then not rest only on the in situ pay-offs to that action, but also to the knock on effects in favourable areas if difficult areas are neglected. Thus whenever we discuss policies we must draw into our analysis these knock on effects.

Annex 1

OPPORTUNITIES FOR INTENSIFICATION and/or COLLAPSE IN FOREST MANAGEMENT

INDIGENOUS AND PARTICIPATORY FOREST MANAGEMENT



stage 1	stage 2	stage 3	stage 4	stage 5
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People's own ('indigenous') forest management begins selectively under the conditions noted in **stage 1** and intensifies, endogenously, in **stage 2**. It gradually collapses under **stage 3**, and what have been functioning CPRs become open access resources of one kind or another.

If external intervention - in the form of state level land tenure rules, forest reserves, land-use regulations etc, - is absent, one of two things happen. Either **stage 3** passes directly to **stage 5** and forest becomes clearly identified farmland, or people move on to a new area where **stage 1/stage 2** forest still exists. Normally, however, the state has a presence, gradually more intensively felt, well before this stage.

Forest reserves/parks may have been set up under **stage 1/2** conditions, and **stage 3** is often associated with the granting of concessions, or the assertion of state ownership of all forest resources, such that a shift to **stage 5** is no longer possible for local people. The very existence of **stage 4** land for any length of time is often an indicator, in fact, of a tenure anomaly which is holding land back from the 3-5 transition.

A variety of new attempts to mitigate the problems associated with conditions found in **stages 3 and 4**, and to stop forests from turning into **stage 5** farms, is under way. All are attempting to stop **stage 4** from developing, and trying to hold onto **stage 3** resources and indeed roll them back towards **stage 2**. Such attempts - externally initiated and involving some kind of partnership between state and local people - are what is often referred to as **participatory management** or as **joint forest management**.



**Rural Resources Management Group
Rural Poverty and Resources Research
Programme**

**ORGANISATIONS, INTERFACES AND REPRESENTATION:
CONCEPTS FOR ANALYSING INSTITUTIONAL RESPONSIVENESS
TO LIVELIHOOD INTENSIFICATION**

by
Anthony Bebbington

**RPRRP
Working Paper No 2**

June 1993

Funded by Natural Resources and Environment Department, ODA

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Introduction

The purpose of this paper is to lay out some themes and concepts that the Network specific papers can share as they elaborate their own responses to the broad question in Theme 2 of the UT: namely

How can developing country institutions be made more responsive to local requirements in renewable natural resources management? What different organizational and institutional forms might best enhance the effectiveness of livelihood strategies emerging under RNR intensification, and by what means might their performance be assessed? (RRMG, 1993:6)

The concepts will give the papers some common reference points and unity, although it is anticipated that as the papers are prepared, the concepts will themselves be amended, expanded or rejected. As in the framework for Theme 1a, this paper is presented as a starting point not a straitjacket.

The Wider Context: politics, institutions and the problems of responsiveness

"The primary aim of publicly funded agricultural research is the well-being of farmers and consumers, many of whom are poor. Research, therefore, should also be accountable to them for the relevance of the technologies it generates and for the ways in which funds are used. While in many countries these people

are silent observers, the widespread trend to democratization is beginning to give them a much stronger voice." (ISNAR, 1993:14)

The problem of weak links and poor (or more usually absent) accountability between natural resource institutions and the rural poor is an old one. It is still, however, a cogent issue. All the more so, because - as suggested by the quotation, taken from the theme essay on "Accountability" in ISNAR's 1992 annual report - questions of accountability and responsiveness are now being linked to wider concerns for some form of democratization and greater transparency in the use of increasingly scarce public funds for development.¹

In dealing with the issue, then, this part of the research programme must link these institutional questions to broader issues of institutional and political change - both for reasons of analytical acuity, and because questions of institutional reform and good government are closely linked in the minds of donors. At the same time, we necessarily have to link the analysis to some discussion of the changes in the relations between individuals, the state and civil society that are apparent in many ldc's today. These changes complicate any simple arguments about participation and accountability because no longer are we dealing with a simple relationship between resource user and public institution. As the state downsizes, other organisations - commercial, non-governmental, popular - are emerging and capturing resources for agricultural development activities. We need therefore to consider under what sorts of conditions these organisations will (and will not) themselves be "responsive to local requirements" (RRMG, 1993:6). Similarly we need conceptual tools to analyse what arrangements linking these different types of organisation will lead to particular types of responsiveness.

This leads us to another part of the wider context which must be addressed. While we may agree with the ISNAR quotation that "the primary aim of publicly funded agricultural research is the well-being of farmers and consumers, many of whom are poor," we ought

¹ We might, though, question how much progress is being made on these fronts. While the ISNAR quotation suggests that this context of so-called democratization has already given the poor more voice, it may be more appropriate to say that it creates a more favourable environment for this to occur.

unpack this claim. Firstly, there are many ways to skin a client-oriented cat. This was clear in the debates that have raged since the origins of the Green Revolution over the appropriate balance between strategies in which a few farmers produce cheap food for the masses, and strategies which prioritise the much slower process of supporting the mass of poor farmers to produce a little bit more (Jennings, 1988). It continues to be clear in debates as to whether agricultural policy should concentrate on the low potential areas where most of the poor live, or on high potential areas (where wealthier farmers dominate) as a means of producing food and foreign exchange for the nation (Mellor, 1988). The debates as to whether policies and institutions promoting export agriculture are more important than policies and institutions for food security demonstrate the same point. The disagreement is not so much over *who* should benefit from natural resources development, but rather over *how* those benefits can be most effectively delivered. Different answers to the "how" question have quite different implications for policy and institutions.

Furthermore, this policy debate occurs within politics. The many producers and consumers who are poor are usually politically far weaker than the few producers and consumers who are not poor. It is the few who have the contacts and networks to influence policy making (Bates, 1981; Grindle, 1986).²

Recent research comparing rice research in Sierra Leone and Sri Lanka (Lipton et al, forthcoming) similarly highlights the importance of political processes in determining the orientation and effectiveness of rice research in the two countries. The study found that rice yields in Sri Lanka are now three times those of Sierra Leone, having been equal in the late 1950s), and that this has largely been due to (IDS, 1992):

- * higher farmer demand for the results of research; and
- * more effective exercise of political pressure by farmers.

This shows that any research on how institutions can be made more responsive must deal with how to enhance the ability of resource users (i) to articulate their concerns to researchers, and (ii) to exercise effective political demands. A concept paper for the linkages study at ISNAR similarly argued that "... the strength and character of farmers' organisations are the single

² An observation that recent revelations show is as relevant to the British political process as to any in Sub-Saharan Africa.

most important determinants of institutional agricultural technology system effectiveness" (Sims and Leonard, 1989:17).³

Thus, Part II of the Unifying Theme (UT) research cannot escape the problems of politics and the politics of natural resources policy making. It must have concepts to address how that policy making is influenced in practice and by whom. These answers will have a lot to do with what sort of responsiveness occurs in organisations.

Finally, the problem of responsiveness has an inter-generational dimension. It is not just that different people and different policies will have different ideas as to what constitutes a "local requirement" - different generations will also have different ideas. A future generation would probably consider it a requirement that the natural resource base in a particular place be conserved so that they have the opportunity to have an NR component in their livelihoods. Present generations may consider short term survival, or rapid capital accumulation, to be local requirements, and so deplete the resource base. As future generations do not have their own voice in political decision making, in order that institutions can respond to their needs there must be a mechanism to represent their interests. We need to consider how those interests are currently represented and how they could be more effectively represented.

From a wider context to a conceptual framework

This wider context gives us a framework within which to hang our analysis. This framework revolves around five thematic levels:

- 1 *natural resources policy and the relationship between state, civil society and individual resource user*
- 2 *the structure of civil society: how it is organised, and the relationships between its organisations*

³ Interestingly this observation seems to have had relatively little influence on the ISNAR work.

- 3 *the structure of the state and how the dynamics of change in the public sector are related to the dynamics of change in civil society*
4. *the mechanisms through which demands (of present and future generations) are expressed and represented, claims exercised and resource allocation decisions made within this overall structure, and how this may be changing*
- 5 *the internal structure of institutions and how this influences the ways in which they respond to demands from the rural poor*

In addressing these specific parts of the framework we must bear in mind the distinction between institutions and organisations. As Uphoff (1992:4) says "[a]n institution is a complex of norms and behaviours that persists over time by serving some socially valued purpose, while an organisation is a structure of recognised and accepted roles." While the distinction may appear pedantic it draws attention to one important point. Before organisations are institutionalised, they remain unstable and so the ways in which they contribute to the channelling of resources and information is subject to fluctuation, termination and cooptation. On the other hand, once practices are institutionalised, their stability means that they are more difficult to contest and change. Thus an institution that systematically excludes the interests of the rural poor will be difficult to change because the very practices that create this exclusion are routinised.

We now look at each of the five themes in turn.

- 1 *natural resources policy and the relationship between state, civil society and individual*

Broad national policy contexts structure the state's view of the present and future structure of responsibilities in society for delivering public goods, providing social security in support of livelihoods etc. The policy context determines in considerable measure the roles of state, market and civil society in allocating resources (including those for research and extension) and determining and protecting rights (including rights of access to forest, land,

water and institutional resources). Policy decisions are not, however, independent of civil society - a point to which we return.

For instance, state policy on ownership of water rights, forests and agricultural land, and of how that ownership will be protected has significant influences on: (i) the role the state will take in supporting processes of livelihood intensification based on those resources; and (ii) the types of popular organisation that might emerge around the control of, and the demand for support in using those resources. The privatization of communally held land will undermine the emergence of community based organisations, and will complicate the ways in which they represent local interests. State policy on forms of local organisation will have a similar effect.

Of particular relevance today is policy on the role of the market. The more that policy supports the idea that the market be the mechanism through which resources are allocated, the more public research and extension institutions will be expected to (and, if they have to raise their own revenue, will have to) respond to market demands. This form of "responsiveness" may not be one that supports NR-based livelihood intensification among the rural poor.

Similarly, an expanded role for the market will lead to increased subcontracting of support services to NR users, leading to the emergence of new organizations to capture these contracts, and so introducing greater complexity into the institutional structure of civil society (see section 3).

However, these policy decisions must be seen within the context of the same set of state-society-individual relations that they structure - for these policies themselves are an effect of pressures from different groups in society: indeed for that reason we must not overemphasise the state-civil society separation. In some sense, the state is that part of civil society that has gained power over the processes of policy making, administration and implementation. Thus, we need also to consider the continuities between groups in society and the state - the social networks, interest groupings and organisations through which individuals and groups cut across the state-civil society division and influence policies.

These are, of course, issues that ultimately have to be dealt with empirically in Years 2 and 3, but as the papers within the Networks are prepared on these institutional and organisational issues, these questions must be addressed for their general relevance to Theme II.

This discussion will also have to address the range of ways in which public, non-governmental, commercial and popular organisations can inter-relate around the issue of how to support NR intensification among the rural poor. As a starting point it is suggested that a framework developed in earlier work in AgREN for NGO-government relationships be used and modified or replaced when cases arise that the framework does not help us understand. The framework is outlined in Annex 1.

2 *the structure of civil society: how it is organised, and the relationships between its organisations*

Civil society, a concept with a long intellectual history has recently pushed its way back into the lexicon not only of social researchers but also of the mainstream development institutions - as in the World Bank's (1991) discussions of "Rethinking the State" and the wider discussions of governance (Healey and Robinson, 1992). One of the main motivations for its rediscovery has been the disenchantment with the institutions of the state - this is equally the case in natural resources research.

"Civil society" is that constellation of associations and organizations located outside the state. As the terms used to describe these organisations often overlap, we need to be consistent in how we name these organisations. Also, in being more rigorous in their classification we can draw direct attention to factors that will influence how they operate, who they represent etc

In civil society, there are a number of organisations which might be relevant to our analyses.

- * peoples organizations (at community, regional and national level)

- * NGOs (local, regional national)
- * NGO networks
- * commercial organizations (for-profit and value-driven)

NGOs and Peoples' Organisations

NGOs can be classified in a range of ways, and Figure 1 draws attention to different categories of NGO that we might use as we talk about them - to ensure as far as possible that we compare like with like.

Two dimensions of classification seem particularly relevant: the intermediary/base NGO distinction, and the membership/non-membership distinction.

Base NGOs are those grassroots organizations (GROs) - communities, associations, user groups - in which all members participate directly in decisions and which operate on a face-to-face basis. They are the arena of direct democracy in decision making (Fox, 1989). Intermediary NGOs are those that give services to these base organizations. They are intermediators because they channel resources to base organisations, and often represent them before other organisations (Carroll, 1992).

Membership organisations are those that are constituted and owned by members of the group which the organisation represents. Their executives are elected by the members. These may be GROs or intermediary membership service organizations (MSOs). Non-membership organisations are constituted and owned by people who are not members of the group the organisation serves. They are not elected by that group nor in any way formally accountable to them. In Carroll's terminology, these are Grassroots Support Organizations (GSOs).

It is suggested we use these subdivisions for analytical accuracy - moreover, the different types of organisation will clearly have different dynamics and different mechanisms and resources for representing and responding to local requirements.

In the case of all these organisation, but above all membership (peoples') organisations

we also need to specify the main and subsidiary functions of the organization, because in many cases the main function will not have been to participate in NR programmes and policy discussions. This will have a bearing on how they approach NR questions, and their capacity (and interest) in dealing with them.

Networks of NGOs

We need to consider the ways in which NGO networks affect the impact of member NGOs on the rural poor's NR based livelihood strategies - technically, economically and above all politically (e.g. via engagement in policy discussions). Of particular importance is to assess the validity of the claim that networks promote better coordination among NGOs and between them and state institutions, and between NGOs and the policy making process. Do they enhance the presence and strength of NGOs and farmers in the politics of the policy making process?

Commercial organizations: for-profit and value-driven

Civil society can also embrace those organisations constituted in order to pursue commercial ends: as enterprises and as associations that represent the interests of those commercial organizations. We need to consider how profit oriented organizations influence the NR strategies of the rural poor. This influence may be economic or political, direct or indirect (e.g. as when the rural poor may benefit from spillovers of gains made by large farmers, or lose as a consequence of reallocation of resources).

Of particular importance is to understand how the NR intensification support activities of popular and non-governmental organizations change as these organizations become more commercially oriented, both individually and as a sector. This is a highly relevant question as the general context of donor support for market liberalisation and agroenterprise development is likely to lead many organizations into a more commercial stance. For instance, resource user organizations will probably have to become more market oriented and competitive in this new environment; and service organizations (membership and non-membership) will find themselves increasingly bidding for contracts to implement

programmes. As this happens we need to know whether these organisations retain or lose their value-orientation (to support the resource poor), how the ways in which they give support to the poor change, and how the impacts of this support change.

3 *the structure of the state and how the dynamics of change in the public sector are related to the dynamics of change in civil society*

The structure of the state institutions that influence natural resource management programmes will vary greatly among countries. However, processes of public sector reform show remarkable similarity (or lack of imagination?) across countries (north and south) and therefore it is particularly important that the Network specific changes consider the effects of the processes of privatization, decentralization and deconcentration on the capacity of both the state and the organizations of civil society to support resource poor farmers' NR and livelihood intensification. One may expect the impact of these public sector changes to vary according to the resource considered: implications for forest management, water management and range management may not be the same. It will therefore be very useful if Network specific papers can elaborate these impacts and then the final synthetic documents can show how similar policies of reform can have beneficial impacts in the case of some resources, and in other cases be detrimental to the rural poor's capacity to improve their livelihoods on the basis of intensification of use of particular resources.

As we engage in such discussions, we must be consistent in how we use such terms, and explicit in what we mean by them. For instance, privatization could be used to refer to instances where the state passes over implementation and financial responsibility for the provision of some services, as well as for those cases where the state sub-contracts other agencies for the provision of services, but continues to cover most or all of the costs involved. Thus, the terms "privatization" and "sub-contracting" should be differentiated.

Similarly in talking of decentralization and deconcentration we must recognise that these terms can be used casually to refer to situations in which central government hands over one, some or all of the following to local government:

- * implementational responsibility
- * decision making power
- * revenue raising power
- * financial responsibility for services

As we discuss the implications of these changes, we must specify the exact change or combination of changes to which we are referring.

4. *the mechanisms through which demands are expressed and represented, claims exercised and resource allocation decisions made within this overall structure, and how this may be changing*

Recent work in AgREN (Farrington, Bebbington and Pearce, 1993) on the concept of "demand-led" natural resources research demonstrates the many layers of representation through which "demand" must be transmitted before it influences research agenda. A hypothetical layering could be: farmer > farmer group > extension agent > research-extension liaison unit > junior researcher > research planning committee/station director > adaptive researcher. Whether the demand then influences research will depend on a range of factors, such as agricultural sector policy, agricultural research policy, research station policy and resource availability. The levels from adaptive to strategic research are even more tortuous, going so far as to suggest - in current thinking - that ODA should operate vis-a-vis UK research institutions as a representative of the "demand" of final users of UK natural resources research.

At each "interface" the successful (ie fair and accurate) communication of demands will depend on a range of factors such as (i) the ability of farmers to articulate demands in ways that are meaningful for researchers, and (ii) the ability for actors at these different interfaces to communicate with each other (c.f. Long, 1989). But most importantly, it depends on a chain of representations: that is, it depends on each actor (extensionist, researcher, farmer organisation etc) giving a fair representation of the concerns that have been communicated from resource users. There are many reasons why this may not occur:

representatives may wish to represent only that sub-set of demands that are relevant to their own concerns; representatives may have no incentive to represent fairly, or at all, the concerns of others; representatives may find themselves having to represent contradictory demands; and finally at any given stage in the chain of representations, conflicting demands may be brought to the table by different representatives, with the more powerful winning out and so excluding the other concerns from any further transmission "upwards" towards research and policy decisions.

This discussion of *representation* is important because it shows the very real limits of possible beneficiary *participation* (Fox, 1989). Direct participation occurs only in activities such as on-farm trials, joint farmer-researcher evaluations etc. It may be the case as an ISNAR team commented that such "on-farm client oriented research can provide these clients a voice - a means to influence agricultural research in order to keep it focused on their priorities" (Merrill Sands et al, n.d.). But this is only a small part of the story. Thereafter, successful "feedback" depends on representation - even if a farmer sits on a research planning board, this is not beneficiary participation: the farmer represents others. This representation is the weak link. Indeed, the same ISNAR studies on on-farm client oriented research showed that farmer influence often went little further than the on-farm plot.

The combined lesson of those ISNAR studies and the research of Lipton, Pain and Richards (forthcoming) is that we need to know how those farmer interests can be represented effectively at higher levels of research policy. Representation, then, ought be our key concern.

Representation is closely linked to the concept of *accountability*. Successful representation is more likely when there are mechanisms that keep the representative accountable to the groups s/he is representing. These mechanisms may be direct - periodic elections. They may also be more indirect: for instance, if a representative depends on having clients, and if there exist alternative channels for those clients to represent their concerns, then the competition for clients increases the likelihood that the representative will be responsive (c.f. Fox, 1989).

We therefore need to:

1. map out those chains of representation
2. analyse the environments, factors and incentives that favour more successful representation of the interests of the rural poor
3. analyse the points in this chain of representation at which conflicting concerns are represented and some concerns become excluded from any further representation upstream (towards strategic research, agricultural policy, etc).
4. on the basis of the above make observations on the sorts of institutional arrangements likely to lead to more effective representation of needs.
- 5 *the internal structure of institutions and how this influences the ways in which they respond to demands from the rural poor*

These same questions of representation also need to be addressed when looking at the internal structure of organisations: for just as needs are represented between institutional actors along the chain of representation, so they are transmitted within institutions. It may be the field workers who hear farmers' concerns directly, but it is usually the director of their organisations who then represent those interests in inter-institutional meetings - and there is no reason to expect that s/he will represent (or understand) farmers' concerns. The question is, what sort of internal institutional organization will increase the likelihood that s/he will understand and give a fair representation?

Much has been said a priori about the extent to which different types of institution are representative, responsive and participatory. Many argue that NGOs and peoples organizations are more participatory, flexible and responsive than state organizations. Previous work in the AAU has shown that we must be careful about such general claims (Farrington and Bebbington, 1993; Bebbington et al, 1993). In the current research we need to be more specific about the types of factors, relationships and institutional arrangements that favour such outcomes, rather than make statements about the types of organizations in which such outcomes are more likely.

One problem we will face here is that there are a wide range of institutions involved

in this process. They include:

- * peoples' organizations (at community, regional and national level)
- * NGOs (local, regional national)
- * NGO networks
- * public sector institutions (local, regional, national)
- * commercial organizations

Each type of organization is characterised by different internal structures and mechanisms allowing representation and direct participation. We will be unable to look at each in detail in this stage of the work, and will have to rely on schematic analyses based on literature. We may want to decide among the Networks the type (or types) of institution to which each will pay particular attention. That would allow us to divide the task among us. We could then deepen these analyses in Years 2 and 3.

Criteria for Assessing the Effectiveness of Institutions

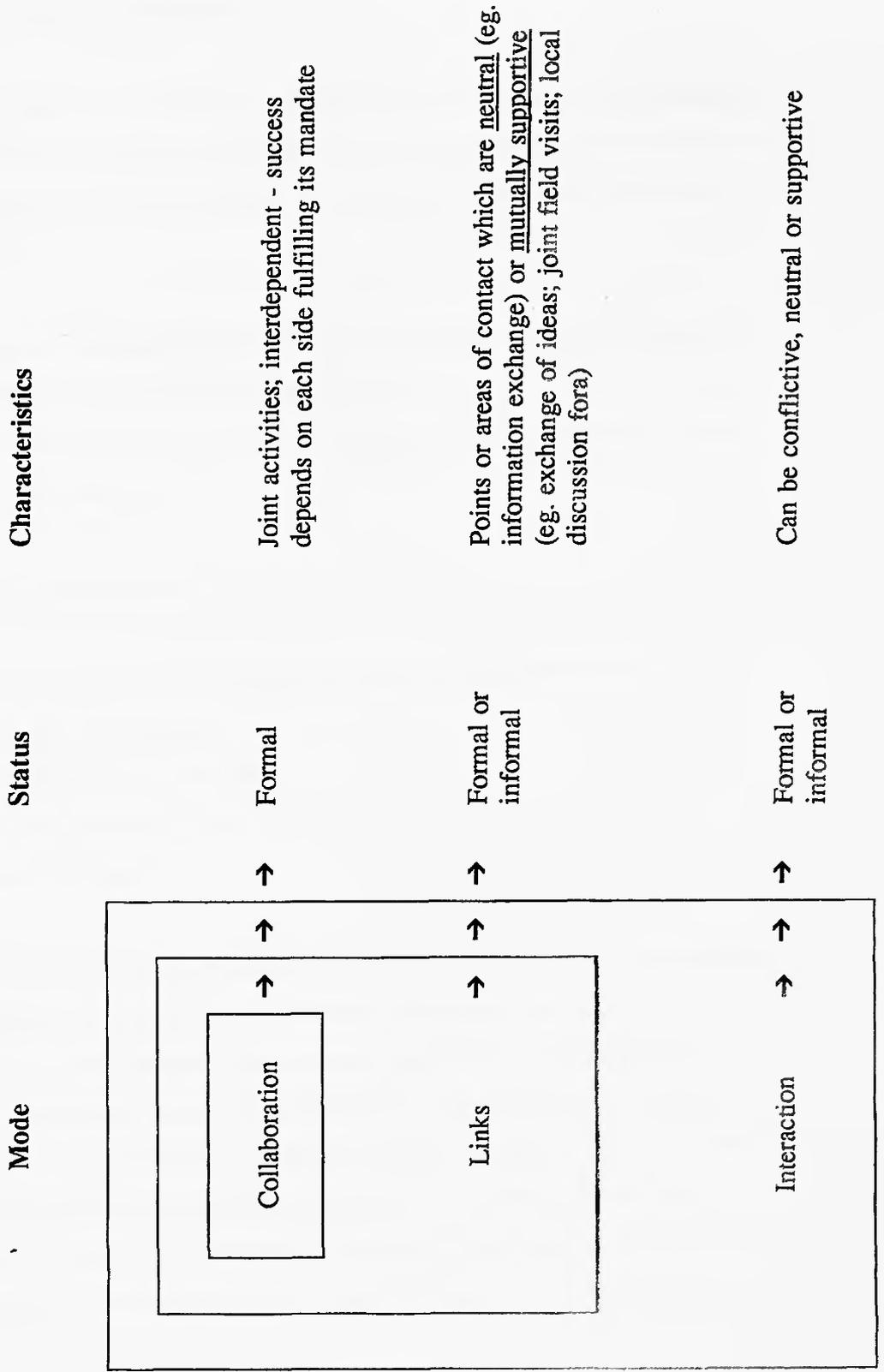
Finally, in Theme II we need to develop criteria for assessing the effectiveness of these different institutional and organizational structures in responding to the needs of the poor. These criteria will almost certainly vary according to the resource base. Aside from suggesting success should be judged by a sustainable impact on poverty and equity, this concept note cannot develop detailed criteria. These will have to be developed in the Network specific papers.

Annex 1**Forms of interaction and linkage among public, NGO, commercial and popular organizations - illustrations from agricultural research and extension.****Interactions**

As we talk about different forms of interaction it is helpful to disaggregate them, (see Figure 1). Interaction is itself the broadest term. By interactions we refer to situations where the actions of one institution are influenced by, dependent on, or oriented toward the actions of another institution. Interaction can be collaborative or conflictive, managed, casual or even totally indirect. For instance, some interactions stem from the fact that different organizations play roles in different parts of the research (and extension) continuum, and so are able to draw on the work of the other in order to enhance the impact of their own activities. In these cases, one institution might, for instance, draw on technologies developed by the other, though without any formal contact (or at times without any contact at all).

As a subset of interactions, collaboration implies a formalised dependence of one partner on another for at least part of the success of its activities, as when, for instance, a GO might contract NGOs to disseminate technologies that it has developed. As another subset, linkages occupy an intermediate position, implying positive interaction that may be formal or informal, but is of a less mutually dependent kind than that designated by the term collaboration. Both collaboration and linkage involve a relationship between organisations that is by the actors and involves conscious coordination and contacts - in other words, these interactions require some form of mechanism for managing the relationship.

Figure 5.1. The differing characteristics of forms of interaction



Linkages and types of linkage mechanism

The mechanisms by which the activities of organizations are linked may be structural - i.e. permitting influence by one side on the institutional or organisational characteristics of the other - or operational - i.e. activity-specific. They may also be formal or informal.

Thus we have:

- operational linkage mechanisms which coordinate or support the implementation of specific ATD functions by the different organizations.
- structural linkage mechanisms which function at a general planning level to create linkages between organisations

a) Operational linkage mechanisms

ISNAR's work has identified four types of operational linkage mechanism:

- (i) planning and review processes;
- (ii) collaborative professional activities;
- (iii) resource-allocation procedures; and
- (iv) communication devices.

Though ISNAR's work used this terminology to refer only to government organisations it was found to be helpful for analysing links between government and NGOs. These operational mechanisms can be classified according to whether they are formal or informal, mandated or voluntary, permanent or temporary (Kaimowitz *et al.*, 1990:233). Formal linkage mechanisms are officially recognized by the institutions involved, whereas informal linkages are based on personal relations between individuals. When the institutions involved can impose their decisions at the level of the two institutions, the mechanisms are mandated. However, when they can only suggest or influence they are voluntary.

It can also be the case that an organization establishes an operational linkage

mechanism for a specific activity because it wants to influence the activity and policy of another organization. For instance, an NGO may seek to change the way the government organization allocates resources, sets its research agenda or carries out certain functions, at the same time as it interacts with the organization with the more instrumental concern of trying to improve the effectiveness of its operations.

b) Structural linkage mechanisms

Among the main types of structural linkage mechanism are:

- (i) coordination units, which have the specific function of coordinating activities between the two actors;
 - (ii) permanent committees made up of representatives of the different organizations;
- and
- (iii) representation by one actor in the managing body of the other.

Structural linkage mechanisms are necessarily formal. They are usually permanent because they seek a more sustainable coordination between institutions. They vary in their ability to impose decisions - some may be mandated, others voluntary.

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IRRIGATION, POVERTY, AND RESOURCE-POOR FARMERS

**by
Linden Vincent**

**RPRRP
Working Paper No 3**

June 1993

Funded by Natural Resources and Environment Department, ODA

IRRIGATION, POVERTY, AND RESOURCE-POOR FARMERS

Linden Vincent

A recent Irrigation Management Network Paper (IMN, 1993) attempted to examine perspectives on irrigation and poverty alleviation in the 1990's. This emphasised that while irrigation development had certainly prevented famine (at least in Asia), questions remained about its utility for alleviating poverty, or to overcome conditions of stagnation and relative decline in rural incomes - even where yield had remained steady or increased. Concerns about the risks of stagnation and increasing vulnerability of subsidised small-scale commodity production are not new - for irrigated or rainfed production (Hall, 1978). However, attitudes to these conditions are changing, as new objectives and priorities of donors and governments change the conception of returns from irrigation development or special assistance programmes to irrigated areas. These new perspectives reflect the changing world economy, increased understanding of development experiences and new priorities in aid targeting

One important component of this component of the Water and Resource-Poor Farmers Network (WRFN) programme will be to inform these new perspectives - to bring both new insights and also a balanced view against the 'demonology' of irrigation, and the many biases for and against what appears as one of the world's most controversial farming systems. Another purpose is to appreciate the impact of changing development policies on those irrigating and those working with irrigators. Changing donor priorities not only effect the continuity of support: the way donors can bring new support is now profoundly affected by the legacy of earlier 'development experiments'. Equally, the potential contradictions between policies to alleviate poverty and policies for more general nation-building and economic growth is perhaps more critical than ever, especially if funding agencies insist on the 're-emergence of the market' at the same time they are also focusing on greater assistance to the poor. Irrigation sits centrally in these controversial areas, since failure to recognise the opportunities the poor can gain from irrigation - if they can get access to water or retain access to water - may leave the poorest to be pushed out by the speculative market raised by growth policies. The

WRFN programme sets out to consider three types of poverty-related policies in irrigation assistance - targeting the poorest through special projects; assisting and protecting the poorest in areal projects; and empowering and supporting groups of poor producers to define and develop the livelihoods they wish to sustain.

There is a 'bad press' emphasising the poor performance of irrigation, and the unfeasible expectations of intensified production raised in many older development projects. However, these should not distract the reader from appreciating that irrigation provides part or all of livelihood strategies for many poor people, as well as underpinning a range of food security, commercial and agro-industrial interests of national governments. Irrigation may indeed have been a 'privileged solution' in terms of funding devoted to it in some areas (Moris, 1987) but it remains of concern to many 'underprivileged people'.

Although some governments have modified their perspective on irrigated agriculture as an economic development strategy, others still emphasise it as a strategy for food security and foreign exchange earnings. While there are areas where farmers have appeared disinterested in the intensive irrigated production commonly promoted, they have still wished to pursue mixed farming strategies including irrigation. Elsewhere, smaller farmers still wish to acquire irrigation (although again, not necessary for intensive field production) and participate in higher income strategies if they can be protected from risks involved. Some of the most vulnerable rural groups - the labourers and tenants and the small household - also have greater employment opportunities in an environment with irrigation than with rainfed farming. Finally, despite the image of environmental damage often directed at large-scale irrigation, some environmentalists have suggested that well-maintained irrigation canals actually help reduce environmental vulnerability, because of the way such technologies focus local attention on the fragility of local lands and promote a collective management ethos.

This concept note explains the approaches that will be taken to disentangle the issue of poverty and the resource poor in farming systems involving irrigation. It first looks at the position of irrigation and the poor in different models of 'sustainable' and

'unsustainable' farming systems. In future components of this programme, further research into these different types of systems, in different agro-ecological zones, will enable 'poverty profiles' to be drawn up which show the position of the resource-poor practising irrigation, and the broader dependencies of the resource-poor in areas with irrigation. This study thus takes some of its framework from the gaps and weaknesses identified in the 'New Poverty Agenda' highlighted by Lipton and Maxwell, 1992. It then introduces the approach to be used in the complementary WRFN programme on 'multifunction organisations', to understand the organisational approaches evolving that give resource-poor irrigators more flexible and effective management of their livelihoods. It introduces the idea of 'stacking the cards' of institutions, technologies and production strategies, to try and explore why some farmers and farmers groups have responded positively to new opportunities in different sustainability contexts, while other have not. Implicit in this issue is also how agencies have also used different 'cards' in different combinations in providing assistance to farmers, and how successful these interventions have been as a result. Further future study of the relationships between livelihoods, institutions and technologies should also help to answer other questions in the 'poverty agenda', such as conditions permitting a 'process approach' which allows relevant programmes to emerge for the priorities defined, free of 'blueprint' solutions. It also hopes to document approaches emerging where there has been less prescriptive introduction of support programmes

The work should also show that assistance to irrigation may still be a relevant tool even for donors concerned to target the poorer farmers - although such assistances may need to be 'nested' in broader 'cross-sectoral' programmes addressing livelihoods. Irrigated agriculture continues to be a valued components of livelihoods for many of the poorest farmers. The issue is that many of the current cost-benefit approaches to irrigation, and the highly sectoralised interests in agriculture do not address the ways many small farmers integrate irrigation into their livelihood strategies (either as cultivators or labourers). Controversially, this programme also hypothesises that a narrow focus on environmental sustainability and poverty, may be quite damaging to the smallest irrigators, especially if irrigation and small irrigators are 'left to the market' and disregarded because they are 'less poor'. The disruption following forced migration as

small farmers were pushed out by commercial interests along the Senegal river stands as one example of outcomes of failure to protect the interests of the smallest farmers (Horowitz, 1989). The 'bad press' given to irrigation interventions may reduce the worst excesses of sectoral bureaucracies, but we know that private loans for irrigation will be negotiated even if international aid agencies back away from funding irrigation development (Gwynne and Meneses, 1993). More seriously, new water resource agencies have shown some weak understanding and interaction with the interests of smaller producers, and the shift in emphasis to managing land and water in specified 'scientific', 'decentralised' and 'democratic' ways could fail to address or actually worsen the prospects for negotiation between planners and small irrigators in some CDR areas (Alfaro et al, 1991; Bolin, 1990; Lansing, 1991; McTaggart, 1988; Sommen, 1990). To make sustainability initiatives work in different environments, there needs to be sustained interest and commitment across all the sectors small farmers are involved in, even the 'privileged' sectors like irrigation

This work is not only seen as important *per se* as part of the programme on natural resource-based livelihoods at ODI. It is seen as an essential contribution to the wider international research focus on maintaining world food needs and agricultural-based export income. ODI is ideally placed to focus on the poor and poorest farmers who may too easily be forgotten within this debate.

Irrigation, Poverty and Poverty Alleviation

Irrigation has received special attention as a tool for economic growth, and as a rural development tool. Nationally, irrigation has been seen as a means to high value commercialised crops for foreign exchange and import substitution, and to provide food security that also reduces imports (Booth, 1977; Lynch, 1988). In the past, the dependence on foodstuffs rather than cash for wages and currency added a special concern to food security in the 1960's and 1970's, especially in rice-producing areas. The 'trickle down' justifications of economic growth policies and 'size-independent' new agricultural technologies may or may not have benefitted smaller farmers. However, irrigation has also received special attention in rural development policies and

programmes, both for the promotion of communal infrastructure and community organisation, and also as a tool to generate rural employment and income at the individual level. Within nation-building concerns, community organisations have been seen as a strategic link between central and village, and irrigation and water resource management organisations have been a particular focus of attention. Military security, frontier management and even counter-insurgency have caused shifts in population and special irrigation assistance, often leaving a legacy of poorer farmers with variable interests in water-based cropping.

The paradox between the continued importance of irrigated agriculture as a food production strategy and foreign exchange earner, and the 'bad press' attracted by the research focus on poor management and infrastructure development has been recently explored by other authors (see Carruthers and other authors in CAB, 1992). They also raise a special dilemma. Irrigation will continue to be highlighted as a food production strategy for the growing world population, as will programmes to improve performance. However, disinterest by donors in 'more privileged' irrigated areas might lessen the opportunities for other 'human development' and poverty alleviation strategies in the form of health programmes, education, community development and small-scale industrialisation. Ironically, as a network member pointed out, such 'human development' programmes would probably improve the dialogue between irrigators and government agencies substantially, and help get the better performance so needed for improved food production! (Levine, in IMN, 1993).

Even if donors decide that they wish to leave questions of irrigated agriculture as a growth strategy 'to the market', or food security to humanitarian aid subsidies, irrigated agriculture still involves many 'poverty-related' issues. Network members have written in (IMN, 1993) to emphasise the importance of disentangling the problems of poor performance in infrastructure (whether from design or management) from those created by macro-economic conditions, or locational disadvantage inherent in the ways that some older agricultural development schemes had been sited in less-favourable areas. Others highlighted the fact that there were areas where increased production potential had kept a premium value on irrigated land, despite all the 'bad press' of inappropriate

interventions. There were locations where smaller farmers had benefitted, but there were other areas where small farmers were under high speculative pressure. Irrigation assistance had actually helped some communities hang onto their lands and water, while elsewhere it had fuelled a process of agrarian change where small farmers had lost badly. Local organisation, their cohesiveness or differentiation and the kinds of support given by public authorities were raised as important controls on the process (Egzabhier, 1993; Quiroga in IMN, 1993; Shah, 1993).

However, despite the potential and actual advantages accruing under irrigation in many sites (Egzabhier, 1993; Shah, 1993, Aeron-Thomas, 1992; to name a few), and the interests that continue to be expressed in irrigation by many farmers, many donors still consider the costs or risks of irrigation 'too high', in terms of one or more of the items listed in Table 1.

Table 1

- | |
|---|
| <ul style="list-style-type: none"> • high, frequently unrecoverable development costs; • requirements of permanent annual subsidies to infrastructure management and agricultural services; • weak or declining performance as a result of inappropriate technical and institutional changes for operations and service provision; • agrarian change adversely affecting the smallest and poorest producers, either because no protective policies were launched or protective policies proved inadequate; • instability and inadequacy in production as some irrigators leave a stagnant agricultural economy to work off-site. |
|---|

These issues are not absolutes, and there are differences of perception between governments and funding agencies over the scale of these 'problems', and in relevant programmes for their resolution

These concerns define the large 'research window' encompassing the opportunity costs of poor performance of many existing irrigation schemes, the benefits from a variety of programmes to overcome these problems, and the resulting financial and moral justification for a range of special assistance programmes therein. These debates show that there are multiple reasons why there will be no simple closing of the gap between water supply and irrigated production, and no easy definition of the key interfaces to address in resource availability, technology supply and irrigated production. Each of the above list of 'problems' now has quite a substantive body of literature, especially the first three on cross-sectoral subsidies, cost recovery and institutional development and irrigation management (the literature is too extensive to list - but the publications of the Irrigation Management Network is a starting point). These will grow further with initiatives by international agencies such as IIMI, and development credit agencies at national and international level

However, the debate is still weak on the last two points, which are set to become key elements of the WRFN cooperative programme. These points raise a number of questions for which literature will be reviewed in the first year, as summarised in the final section of this paper

Additionally, much of the current debate on performance is based around closing the gap between supposed resource delivery and output requirements, and making irrigation financially viable. Yet we know that conditions of resource delivery, output and financial viability are not fixed. Authors are now investigating the effects of financial reform on the incentives for irrigated production and provision of support services (Woodhouse and Ndiaye, 1991). There is also debate to improve understanding of linkages between planned and unplanned changes in employment and labour markets and national food supply strategies. These therefore should not be a central focus of work in the WRFN, although they will inform it. However, a pressing issue remains the reliability of supposed resource delivery under increasing conditions of water scarcity. This central natural resource question defines a further theme of research within the WRFN programme, as does the general role of the community in management of natural resources, both of which are to be addressed in the 1993 programme.

Poverty and the Resource-Poor

A wide-ranging debate about poverty has resulted in a number of definitions from which both absolute poverty and relative poverty can be discussed (Sen, 1980). These definitions usually revolve around ability to acquire sufficient food for survival, whether through subsistence production, or adequate exchange entitlements with incomes derived from labour and services. Survival crises consequent to disasters are often separated from conditions that create persistent long-term poverty, although there are many locations where the two are inter-related (as in many areas prone to natural hazards, especially where survival mechanisms have been disrupted by agrarian, political and environmental change). The question of supporting people to overcome absolute poverty, in the short or long term remains an ongoing interest for many aid policies, and irrigation development continues to be promoted as an option, especially in 'drought-proofing' strategies and food security strategies (Campbell, 1993; Vincent, 1983).

Equally important, however, has been working with the 'relatively poor' to help them maintain their position and even to considerably improve standards of living and livelihood security. Assistance in these areas has often been vitally important to groups wishing to transform their subsistence strategies (where they may be poor but not destitute) into higher risk strategies which they themselves may wish to achieve. These not only remain important to the 'economic success stories' of aid donors. This group reflects an important source of demand for government and aid services which can underpin joint action, and often help achieve broader objects of sustainability and good governance. Key factors in the positive outcomes, and success stories attached to such interventions are either the lack of social differentiation in a group, or a clear sense of some benefit for all, and a flexible and supportive response by local administrative or sectoral agencies who have related responsibilities.

The poor performance of some irrigation assistance programmes has been linked to their attempts to induce desired changes, regardless of underlying economic and institutional dynamics. Problems have stemmed not only from the cropping patterns and agricultural technologies promoted. They have also stemmed from the institutional

disruptions and new organisational demands consequent to new irrigation infrastructure. More commonly nowadays, poor performance stems from attempts to tailor more 'site - specific' solutions, but still importing inappropriate technologies or solutions by drawing on unsuitable external experiences, or scaling up interventions too quickly (Kohl, 1991). The difficulties for programmes targeting poverty alleviation, or special help to the poorest farmers is not only to understand differences in agrarian change and political dynamics between environmentally similar regions. The problems are also to identify poor households, poor communities or poor sections of communities and understand differences within regions.

While we may know what absolute and relative poverty is, it is not so easy to know who the poor are. This becomes particularly important in irrigation, which not only involves two natural resources (water and land), but often a range of human resources (labour, power, knowledge, capital) to acquire and operate technologies in these natural resources, and to process and market the goods produced. The poor may indeed be people without any of these resources. However, the resource-poor may lack access to a range of different resources and be without effective balance across them. Indeed, the likelihood of them becoming more poor or less poor often has to be seen in relation to control of several of these resources. The ability of irrigation assistance to reduce poverty conditions has to be seen against these variable conditions.

For example, conventional labour and tenure-based criteria for social differentiation do help define the most vulnerable groups in many areas where irrigation determines the most profitable landuse strategies, highly capitalised or otherwise (Abegglen et al, 1987; Dandler, 1987; Turton, 1976). However, labour adequacy, labour status or tenure are often not helpful indicators on many small irrigation systems in more marginal areas, especially where mixed farming and off-scheme income activities are important to survival. Ethnicity and date of arrival on site may indicate more about the location of groups on a hillside and their access to irrigation than their actual household resources (Jensen, 1991). Conventional expectation of class and caste indicators have also proved misleading under conditions of rapid social change, as the debate about the development and use of caste in Nepal has shown (Bista, 1991). Writers like Mallon

(1983) and Long and Roberts (1984) have looked more broadly at economic and social opportunities accruing to individuals within a community, and their potential to become and remain 'rural entrepreneurs' in their community. Finally, security is often increased by group membership as well as command of individual resources. While on the one hand, social differentiation inside an irrigation group may help account for poor performance of a group, powerful individuals have often used the concept of a community to exact more power from agencies, so that individuals within the group stay participating because of new benefits accruing to the group, even though these may not spread evenly. From preliminary reading it seems as if entrepreneurs have dynamic effects on groups where they need group members to get advantages and spread risks, and the risks are understood and accepted by small farmers (Shah, 1993). They have disrupted effects where they subvert the resources of the group - especially the water - to their own crop interests (Gelles, 1988; Shah, 1993). What constitutes a 'community', and the relevance of 'community organisations' for defending and obtaining internal and external benefits for members becomes a critical issue on the 'institutions' card, and is referred to again later (it is also a specific research theme in the WRF programme).

Finally, even if we know who the poor are, and why they are poor, we need to appreciate why they seem 'problematic' in rural development and economic growth strategies, and why we have been unable to find relevant assistance programmes despite some thirty years of sustained development interest. There are a number of 'poverty conditions' against which irrigation assistance programmes have launched themselves. Unfortunately, not only have programmes often misunderstood the 'poverty problematic', they have misunderstood the variable causes to each of these different conditions. It is important to continue emphasis on poor understanding of conditions and dynamics of change

There appear to be five critical 'problematics' with the poor and irrigation, and often more than one is occurring in a location:

- access to land and water is inadequate to feed the household or generate adequate income. Increased irrigation has often failed to generate enough surplus

to overcome deficits. Things may get better, but they don't get better enough, so that many households still face necessities of off-farm employment which may also reduce benefits from irrigation. Sometimes this reflects non-availability of crops adequate to generate income, sometimes this reflects the broader macro-economy, and sometimes it reflects the fact that the climate is not suited to intensive field cropping (Abegglen et al, 1987; Conlin, 1980; Kohl, 1991).

- assets are inadequate to acquire, but also to operate and maintain, new technology options. In irrigation, the solutions have often been to deliver special credit, or even the entire technology package to a group. While institutional delivery (in credit and technology) has been a key influence here, it is the ongoing costs of use that may still keep smaller farmers vulnerable - especially to the impact of disasters like drought or pests (Vincent, 1983). While the poor may exist in a potentially speculative environment because of the high potential incomes from new technologies, levels of actual speculation and vulnerability often depend on the interdependencies between the entrepreneurs and resident farmers, and often intervening organisational controls, as the debates from lift irrigation initiatives show (Aeron-Thomas, 1991; Shah, 1993). While Latin American debates emphasise the disruptive power of the speculator or large farmer on the one hand (Gelles, 1988; Gwynne and Meneses, 1993; McEwen, 1975), on the other hand they emphasise the importance of the entrepreneur within community organisations for bringing more resources into the community (Long and Roberts, 1984; Mallon, 1983).
- producers and labourers are too indebted, enslaved or intimidated to participate to take up new options. Variable agrarian reforms have tried to address these tenure and labour conditions with equally variable success. While it is easy to put failure of initiatives against failure in reforms, questions of understanding are still present. The weakness of such households may also be influenced by the nature of off-farm employment - transformation in off-site employment conditions (especially 'white collar' work) has been a significant factor in the emergence of entrepreneurs in poor communities (Guillet, 1991; Mallon, 1983). Complex

questions may also be present about the 'value' of local social relations relative to the actual security that will emerge for a capitalist individual household depending on irrigation supplies and their own land and labour resources (Lehmann, 1986; Platt, 1982).

- returns to irrigation are too low to be attractive, leaving a stagnant or declining economy, in which the smallest farmer is especially poor. This can be a deeply complex set of circumstances in irrigation, reflecting both the broader macro-economy and the special contract arrangements that often exist under state procurement agencies in irrigation (as in the Gezira scheme). One line of action to revitalise cropping has been to diversify cropping and promote higher value cash crops: this has been successful where there is a good relationship between producers and researchers (Rerkasem and Rerkasem, 1989). New developments in contract farming remain controversial, but 'pros' as well as 'cons' have been expressed. While contracts under international agri-business often get the greatest attention, various other forms of contracts are also evolving and declining. For example, the Philippine irrigation administration still accepts payments for irrigation services in rice, handling most of the quality control and transport costs in the process. The persistence of this arrangement suggests benefits on both sides despite opportunity costs to both sides.
- local land and water institutions cannot encompass new people. These may be exclusive to new members, inappropriate to intensification of land use or introduction of new members, or actually unenforceable in a changing political climate. A classic example of the 'unexpected' comes from Nepal, where local water rights based on linking water shares to land rights meant that under new technologies to increase supplies, existing landowners took the same proportions of new supplies and just got more water (Martin, 1986). It has been difficult to get new people in to use the increased supply of water. The persistence of several sets of modern and historic rights, and lack of administration to enforce these, underpins problems in parts of Peru (Gelles, 1988; Lynch 1988). While programmes for institutional development in irrigation are often quite clear about

the institutional principles they wish to foster, they often fail to appreciate the degree of difference between current reality, the systems they wish to introduce and the administration required to sustain new institutions

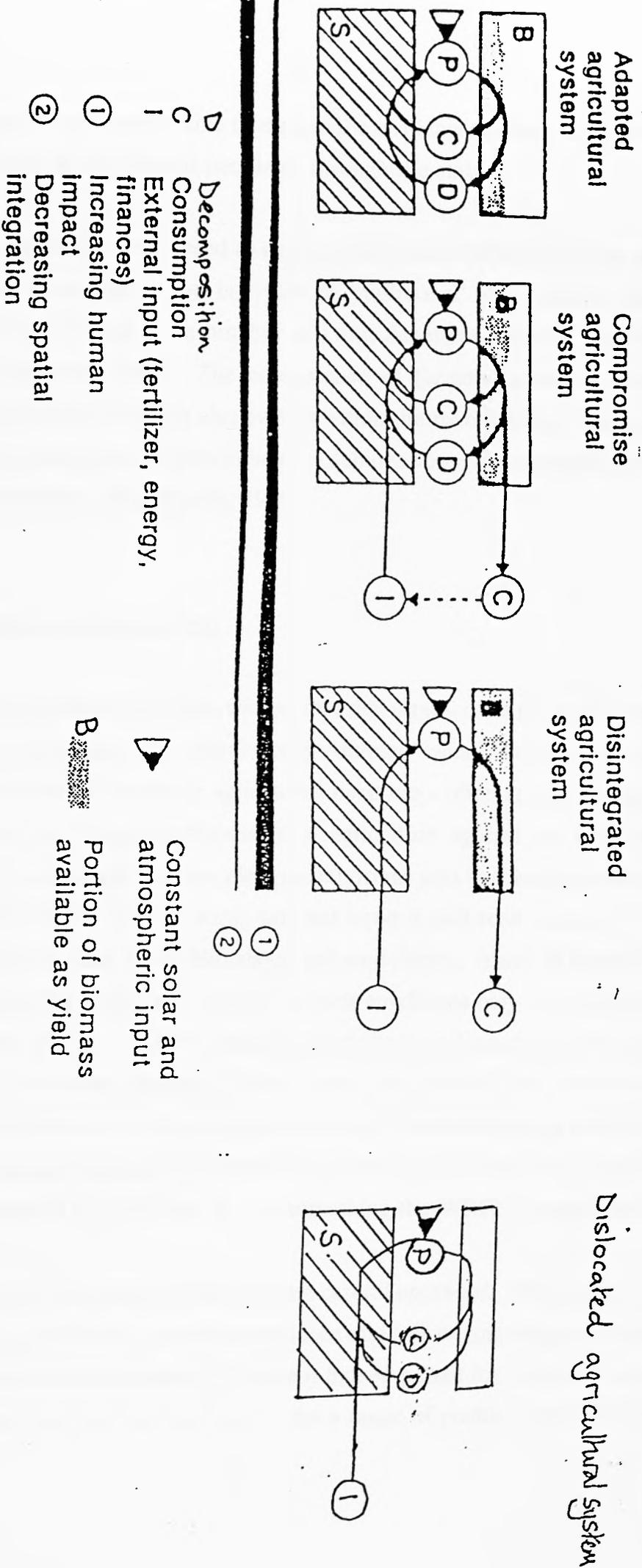
Clearly we need some careful thinking about the 'resource-poor'. We should not allow complaints about institutional failure in delivery to the poor to disguise more fundamental faults still present in the work of agronomists, social scientists and engineers and managers to understand how to work with the poorer people in their areas.

Risk, Vulnerability and the Resource-Poor

To help understand the 'poverty profile' of resource-poor farmers in different irrigation contexts, and different agro-ecosystems encompassing irrigation, this work turns to broader models of the stability and relative independence of different agricultural systems. This paper makes some initial hypotheses around the definitions of Gigon (1983) portrayed in Figure 1. It is worth emphasising that Gigon's work stems from mountain areas i.e. areas often seen as marginal and fragile, but the model can also be applied to other agro-ecological zones and farming systems. Further development of these 'poverty profiles', with a review of experiences to reduce poverty, or give help to the poorest, will be part of the remaining programme for this year. This future work will also be informed by the review of links between irrigation and livestock in mixed farming systems.

This model helps illustrate both how irrigation may be used for greater food production or income generation, and how different groups may be prevented from participating and remain the 'resource poor' in terms of access to internal and external resources flows necessary for irrigated agriculture. More importantly, it can be used to show how the poor may be created by transformations from one farming system to another. This also enables discussion of special support programmes to assist the poorest, and protection of their rights and entitlements. When these concepts of different import/export conditions in farming systems are explored in different agro-

Figure 1: Stability in Agricultural Systems (Gigon, 1983)



ecological zones, it becomes possible to explore the challenges of keeping systems stable, either through the action of local people or through the state.

Finally, the work can be used to explain how these different farming systems co-exist within the landscape. The interplay of 'traditional' and 'modern' agricultural activities has been stressed for a number of Latin American contexts (Dandler, 1987; Gwynne and Meneses, 1993). The co-existence of farmers practising adapted and compromise farming strategies is also evident within the membership of many irrigation associations in Nepal, where it often influences debates about transformation in irrigation institutions (Campbell, 1993; Martin, 1986).

Adapted Agricultural system

Adapted agricultural systems, without external inputs, offer the most conventional, and most ideal interpretation of sustainability. 'Adapted' usually indicates a high level of adaptation of the environment for agricultural purposes - often requiring high inputs of labour - rather than simple performance of agriculture against the exigences of the environment. Local irrigation often plays an important part in this adaptation of natural resources, and zero (or virtually zero) external input is still seen in many 'community' irrigation systems in parts of the Himalayas and east Africa. Many of these systems are within mixed farming strategies. 'The poor' in such conditions may be a large proportion of the population who do not have enough production for adequate survival, or they may be 'latecomers' who have migrated into an area, and perhaps find themselves on the worst areas of land and with least access to water, or without access to water at all. The different institutional dynamics of communities where all farmers have rights of access to water, as opposed to only some, is also something the WRFN hopes to address

The issue of 'adaptation' requires some careful appraisal. While on the one hand technologies may reflect very sound ethno-science and folk engineering, such adaptations may persist for a number of reasons. They may indeed persist for 'negative' reasons such as risk spreading, but they may also persist for a range of positive reasons, and are not

simply 'primitive' technologies or institutions (Gupta and Ure, 1992). Local adaptations may also be frequently determined by offsite opportunities or limitations in employment and capital generation (Lehmann, 1986; Platt, 1983). In addition to environmental and economic reasons for adaptations, political motives may also determine the search for culturally distinct practices (Bebbington, 1993).

The interventions to target poverty in such systems have often addressed food security and employment generation, but often cause problems through poor understanding of existing labour allocation, the constraints to profitable irrigated cropping across the year and preferences for other crops. Many have also introduced a new dependency on external inputs to create 'compromise systems'. They have also looked to transform the systems into 'compromise' agricultural systems, or even disintegrated systems, without attention to the increased vulnerability this has brought to poorer farmers, or how resultant agrarian change has increased differentiation between irrigators and non-irrigators, and reduced the cohesion of community organisation (Boyce, 1987; Pincus, 1990; Spiertz, 1991; Turton, 1976).

The more effective interventions have been those which have addressed the improvements in existing farming strategies and on-farm technologies within existing labour and resource use constraints. Sensitive technical intervention reducing the labour and cash demands of breakdown and increasing security of water supplies - that have remained within the support costs of local people - have also been successful.

Compromise Agricultural System

Compromise agricultural systems, where inputs are imported at various levels, paid for by consumption exported outside the systems, are perhaps the most typical of the farming systems both in more marginal and fragile environments under mixed strategies, and in higher-potential irrigated areas. In fact, the income earned by populations through migration often subsidises the external inputs. This can be a stable system where inputs and outputs are in balance, and production levels are often extremely high. The

critical concern in many sustainability initiatives is to keep many of these systems stable, for fear of environmental degradation and increased poverty if systems destabilise.

Again, engineering and agricultural technologies for irrigated agriculture are often a particular focus of external inputs, and water itself is often imported into the system in irrigated areas. While the poor are again often the people who find themselves with the poorest access to water, they may become particularly vulnerable to speculation, even though capital investments for new technologies are still relatively low. The differentiation already present in such systems is likely to be increased, as the poorest households remain unable to generate subsistence needs, or participate in new technologies because of accumulated debts, pushing them to local employment or off-farm employment. The critical concerns for programme interventions have been to ensure the poorest farmers can get the necessary access to water and inputs to crop with. There has also been concern to improve the relationships between costs of operations and profits attained, with a focus on cost recovery through charges. Specialised community development initiatives, to encourage more local involvement in the delivery of input flows, has also attracted interest. There are also support programmes to amend institutional arrangements to make better use of new water technologies and new production technologies. The poor and poorest may need special help in access to both sets of technologies, and to obtain adequate institutional representation

Disintegrated agricultural system

These systems of highly capitalised, highly commercialised high risk strategies seem the most divorced from ideal images of sustainability. Yet they can be stable, with high external inputs and low internal inputs. They often co-exist with less capitalised systems, and even control the dynamics of these other systems through their demands for labour, and wages paid. While often the least attractive in terms of poverty targeting to many donors, such transformations may be of interest to many small producers if they can withstand the risks of development and control their resources in an environment of high speculation. Controlling their water resources is often a premium issue for many small farmers and many communities. While water and land resources remain critical, it is

factors such as capital, knowledge which are critical for production. Land may 'de-intensify' under irrigation as it shifts from field crops into high-value livestock and horticulture, and use of general labour may de-intensify. However, opportunities for skilled labour at better wages may increase

In such cases the poorest and most vulnerable may be whole communities who find their land and water resources under pressure. Communities are often concerned to participate in change as a whole, or resist as whole, despite internal differentiation in relation to the benefits and risks perceived (Gwynne and Meneses, 1993). Carefully researched technologies remain significant in the introduction of new commercial crops, and special assistance in quality control, agro-processing and even marketing advice may become vital. These more sophisticated support organisations have sometimes helped the poor more by special targeting of niches for production and sound technical advice. In some cases, the incentives to collaborate in this broader livelihood assistance has helped overcome disputes over land between communities and individuals (Gandarillas et al, 1992).

Dislocated Agricultural System

Dislocated systems raise problems primarily through the unsustainability of long-term subsidies on inputs, plus the likelihood that production is likely to be insufficient for survival, creating complication of pressure on local resources and a dynamic of migration which is also disruptive. While not described by Gigon (1993), they can be identified for a range of locations. They are typified by many transmigration developments, or special 'frontier control' initiatives. They may also develop in areas seriously disrupted by disasters, where the state considers a permanent subsidy more useful than large-scale population movements and the abandonment of local land.

Occasionally, they represent part of a 'safety net' agricultural system practised by migrants or nomadic groups, where off-farm activities support part of the community or household either permanently or in times of special stress. Since many of the households may have inadequate production for survival, special initiatives into such systems are

often about shifting them to disintegrated or compromise farming systems, as a way of stabilising systems with lower subsidy costs and lower risks to the environment, while promoting or maintaining a group ethos to manage the dynamics of new farming systems.

Policies and Programmes for the Resource-Poor; Targeting the Poor, Assisting the Poorest or Empowering the Community?

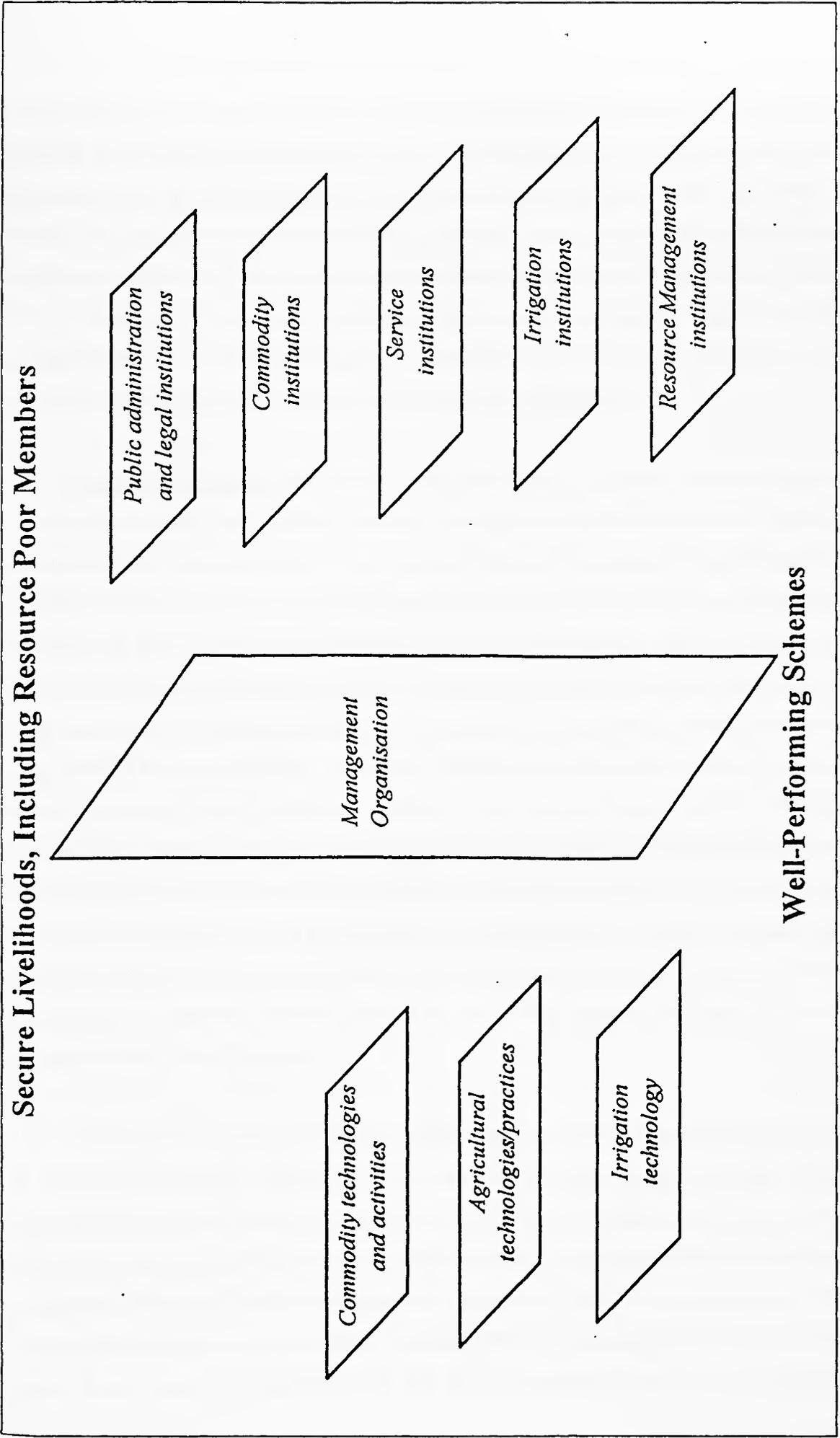
The final strand in this poverty study will be to examine the ways technologies and institutions have been addressed in special support programmes, with a view to understanding more about how programme approaches can be evolved in different environments and farming systems. This will be informed by the special study on 'multi-function organisations' in the WRF programme. While detailed work on these organisations has not yet begun, a diagram has been developed to show the different components that assistance programmes can address for change. Figure 2 tries to lay these out as 'cards', to show how organisations can manage different linkages, and how the approaches of different assistance programmes can be studied as a concept of 'stacking cards'.

The range of development programmes launched to promote positive rural change have taken both a variable commitment to assisting the poor, and directed different quantities of resources towards it. This programme will review initiatives in terms of three approaches:

- * targeting the poor
- * assisting the poorest
- * empowering the community

The best known programmes for targeting the poor are those of employment generation (for example the 'Special Public Works Programme in Nepal'; Baker, 1989; Jensen, 1991; Martens, 1989) or creating group assets which transcend dependence of land alone (for example pump groups in Bangladesh, Wood and Palmer-Jones, 1990) or developing specialised technologies for niche production which supposedly fit into existing livelihood strategies (for example the horticultural initiative in the Bolivian Altiplano;

Figure 2: Responsibilities that can be taken on by irrigation organisations



Kohl, 1991). By and large they focus on or around technologies, and where longer-term problems have emerged, institutional crises or serious economic questions are usually uppermost, even if the crises appear to have environmental dimensions. In Nepal for example, targeting the poor meant technical assistance in challenging environments where breakdowns were likely before new organisations had established themselves (Jensen, 1991). Attention to the poorest communities often means addressing some of the most marginal lands or more stressed agrarian conditions, and the crises produced in such conditions often overwhelm incipient institutional arrangements

Assisting the poorest has directed attention either to special input arrangements to assist with credit and advisory services to target small farmers, or to technology research around the interests of the poorest farmers. Assistance programmes have therefore tried to stack only certain cards, and often faced tremendous problems in getting some service institutions interested in the poorest farmers. Such problems have been particularly well-explored under ODA-funded agricultural research initiatives, and integrated rural development assistance programmes in Nepal (Biggs, 1980; Dhungel and Tips, 1987; Thapa et al, 1988). However, not all the evaluations are bad, particularly where technology and production activities and services have meshed effectively. Information from the Deep Tubewell programmes in Bangladesh suggests that the poorer and smaller farmers have received benefits proportionally, and that their position has not deteriorated in the ways often presumed for irrigated agriculture (Aeron-Thomas, 1992). The poorest have often clung to new irrigation technologies more than larger farmers despite their problems, because they have no other options for supply (personal communication, Dan Ticehurst).

Assistance to the poor by developing and empowering communities is best known as an NGO strategy. However, it is also the strategy of some public regional development agencies where politics permit it, and there is increasing interest amongst once highly-sectoralised bureaucracies now examining decentralisation as a result of the pressures of financial reform programmes (Bagadion, 1991; Gandarillas et al, 1992). Among NGO organisations assisting irrigation within community programmes, the Aga Khan Rural Support Organisation is the best documented community development

initiative (Conroy, 1991), but similar strategies can be found in NGO work across Latin America, Africa and other parts of Asia (Bebbington, 1993).

The key differences between these different organisations are the range of activities they coordinate in an organisation, and the range of institutions for which the organisation acts as a forum of debate and action. NGO organisations often have a wide purview from irrigation technology, and representatives often work to 'interface' better on the resource management and public administration institutions. Regional agencies show some variation over the range of functions incorporated, partly reflecting political constraints, but also reflecting financial and manpower constraints on some of the work they can undertake. Decentralising initiatives made by sectoral agencies often face political constraints. Either there are restrictions in the powers that can be devolved to community agencies, or there is a 'lack of enabling environment' in the general local administration that has to interact with new community arrangements. Concern has also been expressed that attempts to increase functions in institutions should only be directed at mature, well-established irrigation associations (Bagadion, 1991). It is the ability of nationally-directed service and commodity institutions to provide needed inputs into new community organisations which will determine the performance of some of the newly emerging experiments to make irrigation management associations into more general rural livelihood management organisations.

Some Conclusions

Clearly some clarification is necessary on who we think resource-poor farmers are, about what range of technologies and inputs we want to work with under 'sustainable' strategies, and whose interests will be addressed across a catchment. This becomes particularly important as competition grows for water. Many smaller farmers do want access to irrigation, and they want to protect what they have and get it performing better: and they stand to lose a great deal if irrigation is abandoned as a 'privileged solution'. Recommendations on 'sustainable' livelihood strategies for resource-poor farmers' need to be able to address their interests, not define a new 'ideal' adaptive strategy.

Critical to this assistance, however, will be new ways of looking at the involvement of irrigation in livelihood strategies - the inflows of resources that support it, and how farmers combine irrigation with other activities to generate subsistence and investment needs. Central to debates on assistance to resource-poor farmers may be escaping from fixed ideas about what 'intensification' means in terms of land, water, labour and capital, and looking to new cross-sectoral initiatives that function in the way that farmers livelihoods themselves often function.

Future Work Programme

The output proposed from this 1993 programme on 'irrigation and poverty alleviation' is a discussion of patterns of 'intensification' through irrigation, and known experiences of resource-poor farmers in such transformations. This will be developed in relation to the range of agricultural systems discussed, and agro-ecological approaches under development, as well as a further literature review on the meaning of 'intensification' in irrigated agriculture. The work hopes to address the following questions:

Is it true that poor farmers have always lost out in technology transfer programmes directed at irrigated agriculture, or is it only under certain types of agricultural policies or certain environments that they have been disadvantaged?

To what extent has it been inadequate matching of support programmes to different intensification options, and poor understanding of intensification preferences, that have caused particular problems?

What have been the different policy and programme experiences where 'intensification' in irrigation has focused on intensifying capital and technology, rather than use of land, water and labour, or addressed key production resources inappropriately?

Are there ways of working better with the mixed farming strategies that farmers adopt not only in space, but often in time across their lives, and which remain important options in the further transformation of both irrigated regions and regions of diverse landuse?

How do organisations and institutions play a key role in the linking of human and natural resources to coordinate change in technologies and irrigated agriculture, and between irrigated agriculture and other livelihood activities?

How are institutional dynamics of intensification and 'protection of the poor' affected by co-existent agricultural systems using the same land or water sources, and the access of all to water or only some to water.

Future work provisionally scheduled beyond 1993/94 may include 'poverty profiles' of countries, looking at the use of irrigation by resource-poor farmers in different environments, their experiences of poverty-focused initiatives to date, and prospects for future programmes, as informed also by the work on 'multi-function' irrigation organisations

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Rural Resources Management Group
Rural Poverty and Resources Research
Programme

THE CONTRIBUTION OF TREES AND FORESTS
TO LAND-USE INTENSIFICATION AND SUSTAINABLE LIVELIHOODS
FOR THE POOR, IN BOTH DIFFICULT AND FAVOURABLE
ENVIRONMENTS

by
Gill Shepherd, Mary Hobley and Edwin Shanks

FIRST DRAFT

RPRRP
Working Paper No 4

July 1993

Funded by Natural Resources and Environment Department, ODA

Introduction

Following approaches agreed in the preliminary concept paper for this topic, 'difficult' and 'favourable' environments are defined not in simple agro-ecological terms, but in terms of what is given in a particular context and what use the people living there are able to make of what is given. 'What is given' is a combination of natural physical factors such as soil and rainfall, man-made physical factors such as nearness to roads and markets, the legal and institutional situation in which individuals find themselves, the class and gender to which they belong, and finally the levels of technology available to them on that basis, in that particular environment. Thus high and low potential environments are made and not born to a quite considerable degree. This paper will therefore look back on the factors which have generated difficult and favourable environments at a later point, when the nature, extent and dynamics of land-use intensification (and extensification) have been examined. From that standpoint, natural resource policies which may turn the difficult into the favourable can be more appropriately discussed.

The nature, extent and dynamics of the intensification of RNR management in the context of trees and forests, and its relationship to sustainable livelihoods.

In the case of agriculture in the context of intensification, the researcher can look at on-farm intensification, and he can look at how the farmer chooses to supplement the income he thereby derives, by seeking out off-farm employment. In the case of forestry, there is also a third dimension, which tries to capture the relationship between what the farmer chooses to grow on his farm in terms of crops or trees (or raise there in the case of animals), and what he chooses to obtain off-farm from nearby forests or woodlands (including graze or browse for animals.). Intensification changes the balance of these choices, most commonly by the farmer choosing to cultivate on the farm shrub and tree species whose products he would have obtained by gathering in the past, and by gradually bringing livestock onto the farm for good.

Figure 1, overleaf, shows the changing balance between on and off-farm RNRs as intensification takes place. The progression from the left to the right of the diagram might represent the changing land-use in one area over several decades, or the nature of four contiguous areas at one moment in time lying along a continuum from a remote location to one not far from a town. As time (or space) goes by, perennial agriculture becomes more common; soil fertility has to be managed in a new way; nearby forest common property resources shrink while numbers of adjacent farmers grow, to the point where the costs of communal management begin to outweigh the benefits; the numbers of people prepared to collaborate in protecting a resource shrink, and so does the size of the resource they would be prepared to share in.

Figure 1

*Comp D
+ transitions*

PARTICIPATORY TREE PROJECTS - WHEN TO TRY WHAT: A RANGE OF INDICATORS			
Area-type 1	Area-type 2	Area-type 3	Area-type 4
Geographical site characteristics			
remote low pop.density	>----->	>----->	near to town high pop.density
Type of land use			
extensive	>----->	>----->	intensive
<ul style="list-style-type: none"> o Crops + heavy dependence on livestock in dry areas, hunting in wet. NTFPs vital in both. o Soil fertility is maintained by swidden-fallow systems, in wet and dry areas. o Labour is the key constraint in these systems, whether high or low rainfall. 	<ul style="list-style-type: none"> o Permanent agricultural plots where economic. Swidden elsewhere. Still some open land but fallows shortening. o Soil fertility is maintained by silt inflow, dung or is declining. o If animals important, grazing pressure is increasing. Kept on nearby commons. 	<ul style="list-style-type: none"> o More intensive agriculture. Nearly all land held in permanent registered plots. o Dung or other fertiliser saved and bought. o Animals fewer, kept on farms. 	<ul style="list-style-type: none"> o Highly intensive agriculture; with all farms contiguous. o Increasing land prices, and plot fragmentation. o Fertiliser mainly purchased. o Landlessness. o Hired ag.labour o Off-farm employment increases. o Animals stall-fed or sold off.
Extent of common property resources (CPRs)			
<ul style="list-style-type: none"> o Lots of shared forest or range. CPR management rules extant and functioning. 	<ul style="list-style-type: none"> o Communal land getting scarcer. M'gement rules beginning to cause conflict. 	<ul style="list-style-type: none"> o All communal land gone except hilltops, sacred groves. CPR rules now unworkable. 	<ul style="list-style-type: none"> o Scraps of waste land may still exist. Management rules forgotten. Open access only.
LIKELY VILLAGER INTERESTS : PROMISING PROJECT INTERVENTIONS			
<ul style="list-style-type: none"> o Homestead planting for hedging, fruit, shade. Just a few high-value trees wanted. o Tree-related cash from NTFP products such as browse, honey fuelwood or game, foods, medicines. o Forest management with local people (JFM) likely to be successful. 	<ul style="list-style-type: none"> o Mostly home -stead planting, for shade, fruit, hedging and maybe small timber. o Animal damage to planted trees a common problem. o Cash from farm-grown fruit, and from NTFPs. o Try JFM only if villagers seem enthusiastic. Try smaller reserves, villager subsets. 	<ul style="list-style-type: none"> o Interest in field-boundary planting of poles timber and fuel. o Interest in all the homestead options. o Cash sales of fruit, poles, and farm-grown fuelwood, if no competition from remoter CPRs. o Investigate sub-group or indiv. reserves, not JFM. 	<ul style="list-style-type: none"> o All tree-needs farm-grown except high quality timber. o May be good markets for high value farm tree-products. o ? Fodder for stall-fed animals o Alley-cropping and mulching? o Put whole farm under trees and work off-farm? o JFM impossible.

On-farm intensification of tree use and planting

Intensification in the management of off-farm resources will be investigated later. We turn first to the kinds of tree-related activities and problems which on-farm intensification of tree-use and tree-planting call forth.

Case 1: land-use intensification on the slopes of Mount Kenya¹

The survey used here was able to compare land-use intensification at three different altitude and rainfall levels, [Zone 3 (altitude 910-1280m, rainfall 1000-1400mm/yr); zone 4 (760-1220m, 800-1200mm/yr) and zone 5 (610-700m, 650-850mm/yr)] but more importantly was able to look at farms in areas which had been adjudicated long ago, at farms where land was just being adjudicated, and at farms in as yet unadjudicated land. In this area, population density co-varies with rainfall. Crop and livestock sales are the chief sources of income, followed by sales of honey and millet beer (almost 50% of farmers have hives). Four-fifths of wealthy farmers own cattle, while only a third of poor farmers do. Two-thirds of poor farmers own goats, however.

Land consolidation has given the individual farmer greater security of tenure, but substitutes a single larger plot for several smaller ones. The loss of access to plots in different ecological zones reduces flexibility and increases risk, and many individuals have had to give up good higher-zone land. Consolidation also reduces access to fallow and grazing land and forces farmers to adopt more labour-intensive methods. Finally, the strengthening of individual title systematically destroys the clan and lineage as land-allocating political entities. Plots are larger among the wealthy in each zone and tend to be larger in the lower zones than the higher. In this sample the two Zone 3 areas and a Zone 5 area had already completed the land adjudication process, a Zone 4 and a Zone 5 area were about half way through adjudication; and one Zone 4 area had not yet begun upon land adjudication. *community?*

Once land is demarcated there is a new need for boundary markers, and gradually the pole and timber trees which were on the land when it was demarcated will be felled and replaced by planted substitutes of other species. In the medium term, land adjudication engenders the planting of more trees than before, as it does the building of more permanent housing. But it is necessary to look at where on the farm the trees cluster to fully understand the way in which land adjudication changes the landscape.

Figure 2, which was compiled by aggregating data from the 67 adjudicated and 33 unadjudicated farms in the survey, suggests how the clustering of trees on land changes with adjudication. Where previously trees were predominantly planted in cropland, consolidation causes a decrease in this practice and a great increase in field boundary planting. Block planting may possibly increase as well. At the same time, the number of indigenous species saved in the field decreases sharply. It would seem from this sample that more effort is made to preserve valuable species in the compound after land adjudication but that compound planting - already important in the pre-adjudication phase - simply continues much as before.

¹ From 'Trees in the farming system on the slopes of Mount Kenya' Gill Shepherd, a paper presented at the 13th Commonwealth Forestry Conference, Rotorua, 1989, and based on work conducted in 1988 for the Government of Kenya/ODA Embu-Meru-Isiolo Arid and Semi-Arid Lands Project. The full report is entitled 'Assessing farmers' tree-use and tree-planting priorities', ODI, 1988.

During the period of the survey, it was possible to see clearly that adjudication tends to lead to a smaller number of species on the farm, but to the presence of more individual trees from each species.

Figure 2: Where tree species are planted, in adjudicated and unadjudicated land

SITE	ADJUD	UNADJUD
PLANTING compound boundary in compound	18% 15	17% 16
COMPOUND TOTAL	33%	33%
field boundary in cropland in a block	16 14 2	8 17 1
FIELD TOTAL	32%	26%
PLANTING TOTAL	65%	59%
SAVING* compound boundary in compound	5 9	1 8
COMPOUND TOTAL	14%	9%
field boundary in cropland	1 20%	0 32%
FIELD TOTAL	21%	32%
TOTAL SAVING	35%	41%
GRAND TOTAL	100%	100%

* Saved trees are those which are deliberately preserved when land is cleared.

As far as tree products are concerned, poles are eagerly grown in all areas, followed by fruit where feasible. Those in completely adjudicated areas are keener to grow fuelwood than those who are not; and on the whole it is only those whose land is adjudicated who begin to think of making money out of selling fruits or poles. Those in unadjudicated land are the keenest on planting trees as boundary markers and hedges in the first instance, and get their fuelwood and tree-related cash from off-farm sources.

An analysis of trees deliberately saved by farmers shows that good quality timber trees and indigenous fruit trees are especially valued, wherever they are found. However, only some of those species saved are also planted by farmers. The slowest growing species are replaced by less durable but faster growing species, and the rest are replanted in more convenient sites on field boundaries or compounds.

Looking at the way in which trees are incorporated into the farm, it is clear that what has gone on is a process of improvement upon what nature gave in the first place. A tract of bush is turned into a farm with trees on it, through careful processes of selection and enrichment. While the diversity of good hardwood species is gradually lost, the gain in fruit-

trees, in appropriately placed trees of all kinds and in species which are really wanted, is enormous. One sees the hand of both men and women in this process of enrichment on an adjudicated farm. Women work to make the farm cool, sheltered and secure by planting compound shade, windbreaks, and boundary hedging; men have planted tree cash-crops, especially fruit, and have planted and preserved timber for the future. The detailed knowledge of forest trees almost always found among rural peoples, continues in the carefully planned incorporation of privately owned trees into the new tenurial situation.

Thus the intensification caused by land adjudication has had both its positive and its negative sides. The risk-spreading possible in the past, when plots were maintained at several different altitudes, has gone (and wealthier Kenyans usually managed to consolidate their plots at higher wetter altitudes, leaving larger tracts of poor, dry land to the poor at lower altitudes). On the other hand, land consolidation has encouraged all farmers to intensify the extent to which they try to keep trees on their land one way or another, and to reduce their dependence on the woodland sources that they know will continue to disappear, as further farms are adjudicated.

Tree-planting programmes in other countries often demonstrate a tremendous potential for an intensification of on-farm tree-planting, though the poor have often lost out because extension programmes have not been tailored specifically enough to their needs. In the two cases below, the Pakistan case shows how the scales are weighted against small farmers and tenants, while the Karnataka case shows that small farmers were in fact intensifying, even though the forestry department did not notice they were doing so, and could have offered them a far more appropriate range of tree species than it did.

Case 2: farm forestry in Charsadda District, North West Frontier Province, Pakistan²
Pakistan is a country with a particularly high dependence upon on-farm sources of wood (90% of its fuelwood and 50% of its timber come from on-farm sources). In this particular district there is a strong correlation between land ownership and wealth, pure tenants having the fewest resources, small landowners who also rent land having the next least, and pure owners having the most.

Charsadda's wood-based industries offer a substantial incentive to wood-growers. In all, US\$2 million-worth is sold from the district to the industries of the area each year. Land-owners both use more and sell more wood than tenants or owner/tenants. At district level there is an association between land fragmentation and ownership category. Tenants and owner/tenants are more susceptible to the problems of fragmentation than owners. Land fragmentation wastes time which could otherwise be spent farming, and makes it less easy to protect trees. Thus owners benefit disproportionately from tree-planting on this count. Access to transportation in order to sell wood in the market has proved to be a problem for poorer farmers with access only to animal traction, or to none. Wealthier owner-farmers with tractors have benefitted disproportionately from tree growing. Land-owners can wait to sell

² From Khan F.S. 1992 m.s. 'Wood production through agroforestry in Charsadda District, North West Frontier Province, Pakistan' submitted for M.Phil, University College of North Wales, Bangor

wood when the price is high, while the poorer producer has a higher proportion of his capital tied up in wood production, and may be forced to sell at a less profitable moment. Auction is the main sales method and the market can be manipulated to the advantage of the wealthy. As a result, owners feel wood is profitable to produce and sell, while tenants are more dissatisfied with prices. They also have to give a share of the price raised to their landlords, so the overall profitability to them is lessened.

Thus more attention needs to be given to removing some of the constraints to production intensification experienced by the tenants and tenant/owners. In particular these would include the land reform strongly urged by these two categories, and a land consolidation program, as well, to make the farming of a scatter of widely separated plots more unusual. Help is also needed with marketing.

Case 3: the Karnataka Social Forestry Project³

From 1984-1989, and assuming a 60% survival rate, the project probably resulted in about 230 million additional trees on farms and around homesteads - equivalent to about 90,000 ha of plantations (at a density of 2,500/ha).

Many of these trees were planted in blocks by large farmers on marginal lands, but many thousands of small and marginal farmers also planted smaller numbers of trees.

Smaller farmers did not have the land for large homogeneous blocks and tried to get small numbers of seedlings of each of several species, to plant on bunds or near the house (where better protection could be organised). The poor planted more for fruit, fodder, fuel, shade and green manure than the wealthy, when they could.

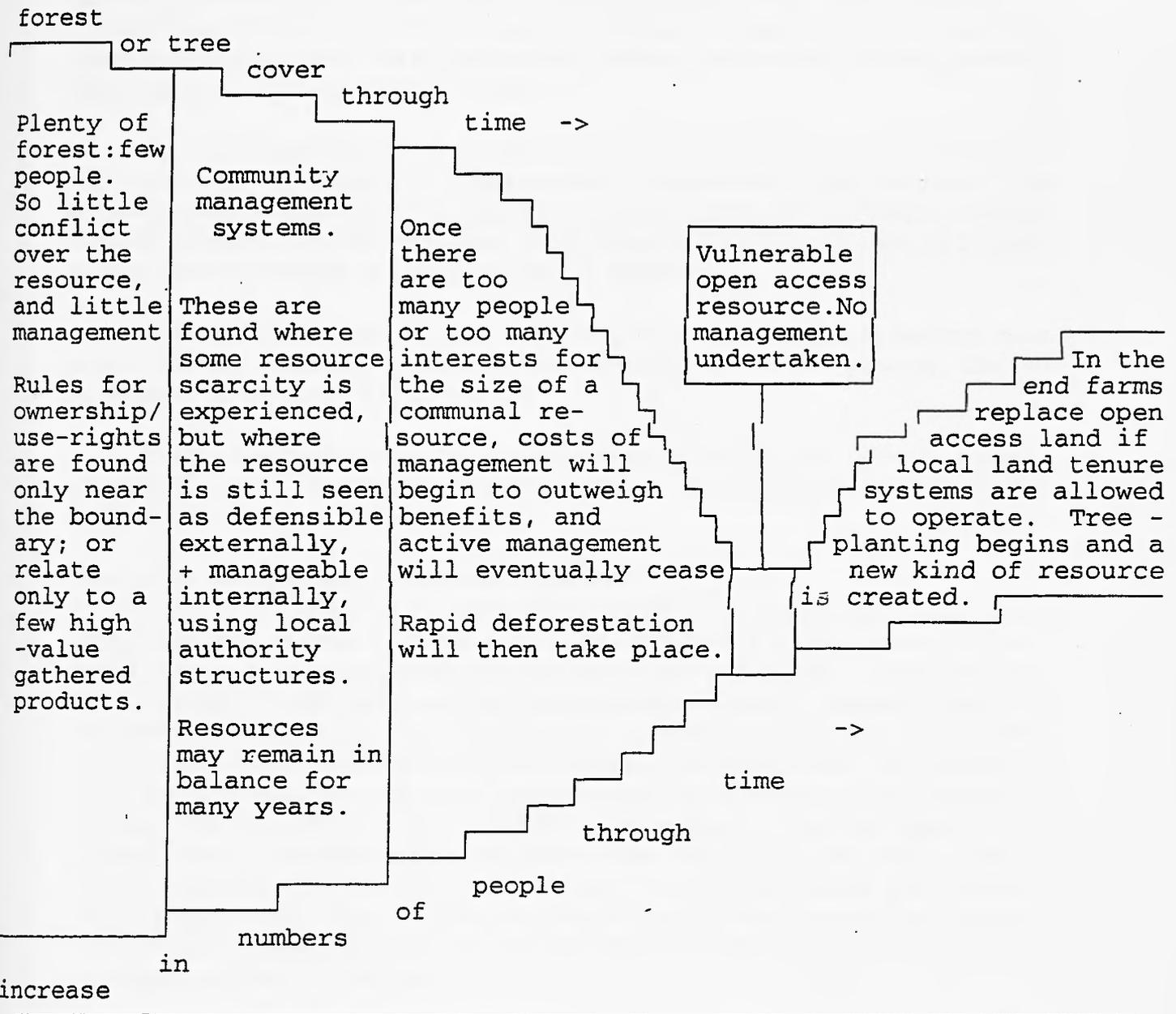
A 'summary of visits' table compiled during the 1989 evaluation suggested that farmers with small holdings (who were often also involved in off-farm employment) were in fact putting a larger proportion of their land under trees than the wealthy. Nevertheless, despite this interest and commitment, the project never managed to supply them with the types of species they were most interested in in sufficient numbers, and continued to tailor nursery production to the interests of the large farmers with their simpler demands.

Off-farm intensification of tree-use and management

In the case of trees, it is almost invariably the existence and availability of off-farm resources that dictate plans on farm, rather than vice-versa. It is less trouble to use already existing off-farm trees rather than plant, and the choice is wider. Yet intensification of off-farm forest management will only continue for so long, and it will then tend to evolve into a decision that on-farm tree-planting is less trouble. This series of decisions is set out in figure 3.

³ Evaluation of the Social Forestry project in Karnataka, India. A report to the Overseas Development Administration by J.E.M. Arnold, P. Howland, P.J. Robinson, and G. Shepherd, July 1989.

Figure 3 INDIGENOUS AND PARTICIPATORY FOREST MANAGEMENT



stage 1	stage 2	stage 3	stage 4	stage 5
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Indigenous (people's own) forest management begins selectively under the conditions noted in stage 1 and intensifies, endogenously, in stage 2. It gradually collapses under stage 3, and what have been functioning CPRs become open access resources of one kind or another.

If external intervention - in the form of state level land tenure rules, forest reserves, land-use regulations etc, - is absent, one of two things happen. Either stage 3 passes directly to stage 5 and forest becomes clearly identified farmland, or people move on to a new area where stage 1/stage 2 forest still exists. Normally, however, the state has a presence, gradually more intensively felt, well before this stage.

Forest reserves/parks may have been set up under stage 1/2 conditions, and stage 3 is often associated with the granting of concessions, or the assertion of state ownership of all forest resources, such that a shift to stage 5 is no longer possible for local people. The very existence of stage 4 land for any length of time is often an indicator, in fact, of a tenure anomaly which is holding land back from the 3-5 transition.

Looking back at Figure 1, it is broadly true to say that as tree-planting becomes more likely, villagers' readiness to manage forest becomes less likely. However, like all generalisations, the reality is more complex.

Firstly, all villagers occupy and exploit a variety of niches in which different economic activities take place. The kinds of variety encountered have been documented recently for Korup in Cameroon, for instance:

Case 4: the Korup project, south-west Cameroon⁴

The forest area in and around the Korup National Park is divided into individual village territories, leaving no areas of "no man's land", except in cases of dispute. Boundaries were created at some time in the past with neighbouring villages to demarcate hunting and forest collection areas. This involved ceremonies between the two villages and frequently particular tree species were planted along the boundary for its demarcation. Thomas et al (1987) describe how villages were responsible for maintaining all the foot paths and footbridges within their territories. Resources on the boundary were often shared by adjacent villages of the same tribal group. Where they were of different tribes, neutral terrain was created on the boundary, which often supported rich old growth forest. Use of the forest within a village territory is generally restricted to members of that village. Where there are good relations between neighbouring villages there may be some sharing of hunting areas and collection of forest products. Hunting rights in particular territories are granted to professional hunters in the villages, or leased to outsiders.

⁴ 'Managing the forest boundary: policies and their effects in two projects in the tropical moist forests of Cameroon and Madagascar' Gill Shepherd, with case studies by Clare Bostock-Wood and Marlene Buchy, ODA July 1993.

Some villages have further rules for forest use, beyond merely who may and may not have access to the resource, but this has not been perceived as forest management by them.

- o In larger villages, collection of forest produce (by women) is controlled by the chief, and there may be a restriction on the harvesting of certain NTFPs until the chief announces the season open. For example, no collection of Bush mango (*Irvingia gabonensis*) is allowed until all the crop has fallen so that the ~~crop on the tree~~ is not damaged by people climbing it. The same rules govern Kasu (*Tetracarpidium conophorum*), bush plum (*Dacryodes edulis*) and palm nuts in the village forest. Small villages do not have restriction of this kind.
- o Each village has a sacred grove that is controlled by the Ekpe (secret society) chief of the village. It is usually an area of rich primary forest close to the village, where certain forest products, for example dyes for traditional costumes, are found. ~~Use of this area is restricted even to members of the village (outside the Ekpe society) and information its location and the important species in it was not forthcoming, especially to a foreigner.~~ *are prevented from using this area*

Although villagers are allowed to make new farms where they like in the village territory (except on other peoples' old farms), farms are rarely made more than an hour's walk away from the village. Thus there tend to be a series of concentric zones around a village with compound farms nearest to the village, and then 'chop' (subsistence food) and coffee/cocoa farms, forest land for gathering non timber forest produce, and finally the hunting zone. Women do not tend to go very deep into the forest alone; they go in groups, especially in the wet season. The fallows-based farming system appears to function sustainably, with such a clearly 'mapped' understanding of the age and ownership of particular fallows that young men can decide to farm their grandfathers' rather than their fathers' fallows.

implication?
Villages with small populations and large village territories are in the position of being able to sell usufruct hunting rights to outsiders because they cannot utilise the entire resource. But villages with large populations do not sell their hunting rights because the entire area is needed to satisfy village needs. It is similarly in the larger villages where we see the creation of rules governing the gathering of NTFPs. As we see in figure 4, forest management intensifies as the forest begins to be more hotly competed for - which happens earlier in the larger villages. We may also suppose desired individual tree species such as indigenous fruit trees are first brought in to farms when individuals begin to feel that they cannot be certain of gathering all they want in the forest, because of increased competition for the resource in question.

It would seem from the fact that several villages in the area have two separate sites (for instance Meangwe I and II, and Lipenja I and II), that there is an upper limit for the number of people who can easily farm, gather and hunt within one village terrain sustainably, and that villagers are aware of roughly what it is. When that number is surpassed a section of the village, or perhaps the younger generation, go to look for a new forest area in which to recreate the pattern. Thus intensification proceeds to a certain point, and is then halted before the forest is over-used.

Many other factors can come into play, however, which will disrupt this orderly self-adjustment of people to resource. One of the most common is decree or legislation by the

state which, without intending to, cancels at a stroke the incentive or the legality of local management. In these circumstances, a deintensification of management leads to a greatly increased intensification of land-use and deforestation.

Case 5: the Sukuma in Mwanza, western Tanzania⁵

The Sukuma live in a rolling landscape in which originally they lived in scattered homesteads around low stone outcrops, and grazed their animals seasonally in the valleys between these hills, or among the trees on their crests. They are agro-pastoralists who are having to place an increasing reliance on agriculture as population densities rise. Sukuma rules for land-use designated each hill - and the tree-cover on it - as the exclusive common property of those who lived around it, while specific valleys were similarly used by an identifiable and fixed number of local households for their cattle.

During the Ujamaa period, the Sukuma had to leave their dispersed homesteads and cluster in villages. This created unforeseen problems, of which one was more concentrated fuelwood gathering in limited areas, and another was lost control and management of now remote hilltop, common land and in-field tree resources. Now unprotected, these areas fell prey to urban charcoal burners and were lost to their original subsistence users.

A similar kind of deintensification, effectively, has occurred wherever governments have denied communal tenure instead of building on it. A particularly tragic example, which has eventually led to more bloodshed and chaos than anywhere else in Africa, is that of Somalia, where the denial of the formal existence of clan rights (while in fact one dominant clan took advantage of the denial to consolidate power entirely within its own hands), eventually produced profound revenge. The work on which the case is based is five years old, but worth including because it gives us a picture of earlier management strategies, the results of the 'management deintensification' period, and villager's proposals for the revival and further intensification of the earlier system.

Case 6 The herders and farmers of Bay region, southern Somalia⁶

The Bay region of Somalia lies about 300km inland from Mogadishu the capital. The area is semi-arid, receiving 300-500mm rainfall p.a. The people of the region are agro-pastoralists, herding camels, cattle and goats, and producing sorghum. Trees are vital: it is impossible to live in the area without animals, and tree-browse sustains goats and camels entirely, and cattle for much of the year. Trees also supply housing materials, fuel, agricultural and herding equipment, domestic utensils, human and animal medicines, and furniture.

Until 1960 clan membership (which gave both kinship and territorial identity) defined land rights and dictated the duty to defend lineage (sub-clan) land against outsiders. Private plots existed alongside common grazing lands, communal annually repaired dry-season

⁵ Shepherd, G. 1989. 'An evaluation of the village afforestation project, Mwanza, Western Tanzania'. ODI for IIZ Austria.

⁶ Shepherd, G., 1989 'The reality of the Commons: answering Hardin from Somalia' in Development Policy Review, London: Sage, Vol. 7, N° 1, March 1989, p 51-63.

rainwater reservoirs, and remoter open access areas. In 1960 clan land-rights were abolished, and both common property resources and open access land were lumped together as State land. Thereafter, nearly all previous attempts at management by area and by membership of a fixed group came to an end.

Currently (1988), Bay groups still request permission to use each others' grazing areas as if the earlier system was in place, but have no right to ban outsiders, such as charcoal burners, from access to 'their' resources. Much of their outrage over the felling of trees for charcoal is because their own management priorities are for living trees. Senior adults discouraged excessive tree-logging for goat fodder, and for sorghum-pit linings, and taught herd-boys to spread risk and offtake by using a wide variety of tree species for animal fodder, so that a sequence could be used right round the season; different categories of animals were taken different distances from the home base so that (for instance) species eaten by cattle unable to walk far would not be used up by camels which can travel to far more distant sites.

The proposals from villagers for their own renewed involvement in bushland management in their area were as follows:

Firstly, that a tract of bushland on the edge of the farmland be set aside for each village, from which they would have exclusive access to poles for house-building. Village chiefs or committees would arrange the protection of the reserve, who might cut poles and when, and open and closed grazing seasons.

Secondly, that village grazing areas (beyond the exclusive pole areas) be used by villagers, and by neighbouring villages on a reciprocal basis. The reciprocity is a necessary mechanism because of the highly local nature of the showers that fall from season to season and year to year.

Finally, deintensification may be the result of a longer and less abrupt process. Thomson (1983)⁷ notes that the tendency of francophone African states to have declared all trees the property of the state has had a negative effect on fallow management, and that this coupled with outmigration from the Sahel to seek work in towns (for cash for taxes, remittance money, and for a less arduous life) means that the labour intensive management of trees on fallows and in forest has ended.

In the past, group control allowed fallowing without land being lost. Present-day tenure rules, on the other hand, tend to allot land to the tiller and to re-allocate untilled land elsewhere. The result is that people become wary of fallowing their land for fear of losing it, and tree cover is lost. All trees, even those on farms, now belong on paper to the State Forestry Service rather than to the owners of fallows. Increasingly they are claimed by the farmers on whose land they are to be found, but it is now their fuel, rather than their soil amelioration qualities which are valued.

Thomson, J.T. 1983. Deforestation and desertification in twentieth century arid Sahelian Africa, prepared for conference on 'The World Economy and World Forests in the twentieth century', University of North Carolina.

Labour migration from the Sahel has encouraged extensification of agricultural techniques, for despite population growth, more men and more young people have left the area for ever. Farmers are now trying to cultivate the most land they can in the least time, at the very beginning of the rainy season. The orderly management of land practised by the extended family in the past is collapsing, long duration swidden-fallowing is coming to an end and more and more marginal lands are farmed, with accompanying destruction of bush areas. Each household head now tries to spread his bets by sowing over as wide and varied an area as possible with the result that older practices such as manuring, intensive sowing and weeding, planned fallowing and water conservation, have all been replaced by quick easy farming.

What issues should natural resources development policy be addressing under conditions of increasing intensification in relation to trees and forests?

1. The preliminary examples given here suggest that, both on the farm and in the forest, there are processes of intensification at work all the time which are most unlikely to be visible to outsiders unless they have enquired in great detail. Since we are trying to turn difficult environments into favourable ones where we can (or at least, not turn favourable ones into difficult ones accidentally), the first issue should be a much greater encouragement of enquiry. It will be very easy accidentally to create further problems where we think we see solutions. We should perhaps be especially aware of the following issues:

- o intensification and de-intensification happens within the land-holding of one household, and between the farm and the forest on which they depend. The balance continues to shift as the household's labour and cash availability waxes and wanes. We need to be more thoughtful about when intensification on the farm is the relevant response, and when intensification of forest management with/for local people is appropriate.
- o a related question, also related to the forest/farm interface: do we know enough about when we should be trying a communal, group, solution to a problem, and when it is better to work with rural people as individuals?

2. The World Bank Report on Health, 1993, states that by the year 2000, nearly 50% of people in the developing world will be living in cities and towns. (More like 30% in Africa and Asia). With this constant drift citywards, we should be looking for ways of managing rural resources in the tropics with any help available - rural people themselves, the state, NGOs. so long as those selected will be able to make a longterm commitment.

3. In the particular case of forests, on-farm intensification is often asked of those who live near them, not for their own wellbeing, but for the sake of the forest, environment and biodiversity. The high livelihood cost of this has scarcely yet been examined and the assumption underlying much of the current work in forest conservation is that villagers will be less likely to rely on forests as a source of income if they are given equal or more attractive sources of livelihood elsewhere. This has led to efforts to: intensify agricultural production through agroforestry and soil conservation; improve villagers' access to produce and labour markets; impart knowledge of higher value crops; help to develop eco-tourism; and facilitate the harvesting of non-timber forest products.

However, most of people living near forests are marginal from the point of view of

national priorities, and find themselves trying to make a living on land which is marginal in quality, or marginal to them because they have no permanent right to it. It is a characteristic of households in marginal situations that they often have to put together a meagre livelihood from very diverse sources which include some off-farm employment, some on-farm subsistence and cash crop production, a few animals, and the use of off-farm tree-based resources for fuel, fodder, manure, building materials and where possible the sale of non-timber forest products. They are unlikely to want to give up some access to forest land, therefore, because any alternatives they might be offered could only supplement, but could never replace this key livelihood source. Development programs which stress conservation often hope for such a substitution (the notion underlies the whole concept of buffer zones), but in general, if there were alternative income sources that a foreign funder could think of, local farmers would probably already have thought of them.

More work in this area is needed (and is being done in ODI) before policies can be evolved for this area, but it is currently a very unsatisfactory one. The complementarity of forest and farm in remote locations is essential, and a denial of the need for forest turns a remote but often reasonable environment into a very difficult environment indeed.

4. Anecdotal evidence, and a few pieces of research already complete (e.g. Tiffen and Mortimore 1992, the EMI case in this paper) point towards the suggestion that in the right circumstances more people can be better than fewer, for natural resources. While we are all familiar with the natural resource disasters which occur when mass unplanned immigration into forest or watershed happen, we must be careful not to allow those negative examples to make us decide that more is always worse.

There is a tendency in forestry planning, dating from many decades ago essentially, to hope that people will not become an issue, or that they can be induced to 'participate' by leaving a particular resource alone. Any third world forester will explain that this is no longer a possibility if he works in the field, but often he is working to foreign funders who expect forest management or conservation to work in this way. A very large gap has grown up between policy and planning - and reality - in some cases. The policy changes needed here are in the north, not the south.

5. Many of the policies devised for rural people in the context of forest-use or tree-planting concentrate on the local situation and not the national level one. Some countries are making changes at the national level intended to benefit local forest users (such as Cameroon and India), but more detailed work is needed to look at the actual legislation and plans of a variety of countries, and the effects of change in countries which already have new policies in place.

6. To return to figure 1, not all interventions are appropriate to the context. We know a good deal now about when to try certain kinds of tree-planting projects, but we are a good deal vaguer about when to try management with local people and when to assume that it cannot work. There ought to be more than one kind of management, too. The diagram suggests (based on evidence drawn from the extensive survey conducted in Shepherd 1992⁸)

⁸ 'Managing Africa's Tropical Dry Forests: a review of indigenous methods' Gill Shepherd, ODI Agricultural Occasional Paper 14, Overseas Development Institute, 1992

that sometimes, where larger forests are no longer manageable by local people (and therefore, by implication, not by the state either), management in smaller areas by smaller groups of people would still work. This is the theory behind the user group notion evolved in Nepal, and it is a pattern observed among rural third world people themselves, under intensification. For instance, once open grazing in Ukambani, Kenya is now divided into grazing for small groups of adjacent neighbours, and finally for single households. Policy interventions can meet some of these efforts halfway, by being prepared to accept novel groups as managers, and by ~~helping to~~ ^{helping to} devise a management regime which has elements of flexibility in it for future intensification.

Conclusion

Flexibility in our approaches to forests and trees, a recognition that much that worked in the past will not work in the future, and that there was a good deal which did not work well in the past either; and finally a continual stress upon the importance of realising that difficult and promising environments are to a surprising degree what institutions make them, will hopefully lead to a more thoughtful policy environment for the environment, in the future.



RURAL LIVELIHOODS AND AGRICULTURAL DEVELOPMENT
POLICY: RETHINKING THE LINKS

by
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RPRRP
Working Paper No 5

January 1994

Funded by Natural Resources and Environment Department, ODA

RURAL LIVELIHOODS AND AGRICULTURAL DEVELOPMENT POLICY: RETHINKING THE LINKS

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SYNOPSIS

THE CONTEXT

Whilst it is rash to universalise, we can make some general statements about the context facing programmes of agricultural development in developing countries in the 1990s. We can make some general statements about agriculture, the environment and the poor, about the macroeconomic contexts, and about the national and international institutional setting for current programmes. They are general statements, however. The situation is different in different countries, and in different areas within countries.

Firstly, the share of agriculture in GDP is falling, the relative importance of agriculture as an income source for the poor is declining, and the share of national population and of the poor residing in rural areas is declining, though it still remains high in many countries in Asia and Africa (Table A). At the same time, resource degradation and land subdivision have in many areas led to a situation in which direct agricultural production alone cannot conceivably provide an escape from poverty for many of the rural poor. The relative importance of potential *indirect* effects of agricultural development on the employment possibilities and purchasing power of the rural (and urban) poor is growing vis-a-vis the *direct* effects of agricultural development on their capacity to produce food for consumption and sale. These indirect effects include employment generation on other farms, and the demand that certain forms of agrarian growth can create for the labour, services and products of the poor.

The second observation is that agriculture in the 1990s will develop in response to a *relatively* more favourable environment than it did in the earlier part of the 1980s. Biases against the agricultural sector, through price controls and the subsidised import of food, are being reduced within the context of reform programmes reducing different forms of public intervention in the market. Of course in many cases, for instance in Latin America, these changes occurred within the overall context of a crisis in which growth in all sectors of the economy declined. Thus, in Latin America while agriculture became the most dynamic sector of the economy following these liberalisations, its rate of growth in the 1980s was still well below that in the previous two decades (de Janvry and Sadoulet, 1989).

In the 1990s the policy context is therefore more favourable to agricultural investment than in earlier times. Yet in fact, donor and government investment in agriculture is falling (Puetz et al, 1992; World Bank, 1993). This makes it that much more important to identify the types of investment that yield highest social returns and that the private sector will not undertake by itself. Some types of private sector investment may generate social benefits (via employment generation) but will often avoid the higher risk and lower potential environments in which the poor live.

These global trends in the agricultural sector - which of course vary greatly among different countries - provide the basis of the two principle questions underlying this paper. The first

question deals with the role of agricultural development in alleviating the poverty of low income groups for whom direct agricultural production can still be a basis for finding a way out of poverty.

- how are we to understand the role of agricultural growth and agricultural intensification in rural poverty alleviation and what are the main forces undermining agriculturally based livelihoods for the poor. In what ways can agricultural policy address, and redress, these forces.

The second question (or set of questions) addresses the role of natural resources and agricultural policy in alleviating the poverty of those rural families for whom direct agricultural production is not a possible or feasible livelihood strategy. Within a context in which we are learning the extreme difficulty of success in income generating projects for the poor (Riddell and Robinson, 1993):

- should agricultural research/extension policy be interested only in the poor whose livelihoods depend primarily on agriculture, or should it concentrate on a broadly conceived "rural" poor? If agricultural policy should cast its net wider, and concentrate on the rural poor as a whole, what does this imply for the sorts of initiative it might support - and in particular, what role is there for supporting off-farm, natural resource related activities?

The responses to each of these questions will suggest that in a number of contexts an appropriate response will imply agricultural policies that are rather different from simple research and extension initiatives.

THE PAPER

The argument of this paper is simple: if agricultural policy is concerned to address the needs of poor people, and to intensify their livelihoods (see Bebbington et al, 1993), then frequently its concerns must also lie beyond the farm. This is so for several reasons. Firstly, for those poor households who have the option of improving their livelihoods through agricultural intensification, the likelihood of this occurring depends primarily on the existence of an environment in which the returns to labour invested in agricultural intensification exceed the returns to other livelihood opportunities. Cases in which farmer led (or "autonomous": Lele and Stone, 1989) intensification has occurred show that this occurs not so much because of the presence of research and extension or other such services (though the existence of appropriate technology is crucial). Rather the existence of market possibilities and access (defined in social as well as physical terms) are particularly important. Agricultural intensification depends therefore mainly on increased effective demand for poor peoples' agricultural products. While liberalisation programmes may be a necessary precursor to this, research shows that per se liberalisation will be insufficient, and needs the complement of rural investment programmes (for Africa see Duncan and Howell, 1992: especially pp 199-208; and Latin America, see de Janvry and Sadoulet, 1989). Indeed, it can be strongly argued that now under liberalisation the macroeconomic context is more conducive to rural investment than ever it was under macroeconomic policies which did not favour agriculture.

Table A: Agricultural population projections in the case study countries

	Turning point ¹	Total population in agriculture (000) 2025	Percentage of total population in agriculture 2025
ASIA			
Bangladesh	2010-2020	93618	43
India	Beyond 2025	621052	51
Indonesia	1985-1990	51532	19
Nepal	Beyond 2025	29040	86
Philippines	2010-2020	30433	30
Thailand	2000-2010	30090	35
LATIN AMERICA			
Bolivia	Beyond 2025	4380	24
Chile	1960-1970	878	5
Colombia	1985-1990	5317	10
Ecuador	1990-1995	2335	10
Peru	2010-2020	8257	20
AFRICA			
Gambia	Beyond 2025	1004	67
Ghana	Beyond 2025	14193	30
Kenya	Beyond 2025	48925	59
Senegal	Beyond 2025	12504	70
Zambia	Beyond 2025	12444	52
Zimbabwe	Beyond 2025	16493	51

Source: United Nations, 1988.

¹ i.e. period in which annual rate of growth of labour force in agriculture is nearest to zero.

Secondly, recent studies (IFAD, 1992; Carroll, 1992; Riddell and Robinson, 1993) have argued that it is extremely difficult to target the poor with income generating projects - whether these are agricultural or not. This is so for a number of reasons: insecure resource bases, unstable livelihoods, etc. If this is so, then it may be the case that a more viable and effective way of assisting the very poor (excluding those physically unable to work) is by aiming to create an environment where overall demand for rural labour and products grows.

Thirdly, there are many poor rural households who have no means of escaping from poverty through agricultural intensification - indeed if they attempt to do so then in many cases their actions may aggravate environmental degradation (Leach and Mearns, 1992; Lele and Stone, 1989; Bebbington, 1993). In order to address the needs of these households, which represent a rapidly growing group (e.g. de Janvry, Sadoulet and Wilcox, 1989; Haggblade et al, 1989), then agricultural and natural resources (NR) policy must work with the objective of supporting livelihood intensification rather than simple agricultural intensification. This implies a differentiated policy that provides a range of options to the rural poor - agricultural options to those smallholdings that are still potentially viable units, and employment options to those who are not. Such a strategy boils down to combining research, extension, credit etc support to viable smallholdings, and then for the landless and chronically land poor promoting employment opportunities in rural areas through particular sorts of labour intensive agricultural development, or through creating demand for labour in off-farm stages of the food system (eg processing, marketing etc). Mass employment programmes (as in India) also have a role although they fall beyond the mandate of NR policy.

These two strategies are synergistic: increasing livelihood opportunities for the rural poor will, by increasing their incomes, foster increased demand within rural areas for rural and agricultural products, thus improving the environment for agricultural intensification on the viable smallholdings. It is also more probable that it will encourage a form of accumulation in which profits tend to be reinvested within rural areas, in employment generation and land improvement, perhaps above all by the emerging stronger smallholder class.

To make this argument, the paper has the following structure.

The paper opens with a discussion of recent thinking on sustainable rural livelihoods. It links this to a framework which can help us think through the linkages between different levels of action and analysis. More specifically, the framework concentrates on the linkages between national, regional/local and livelihood levels. This orients our attention to the different types of action required to support and intensify different types of rural livelihood. In this paper we are particularly interested in how the implications of these interrelationships for poverty-oriented policy interventions. In another paper (WP8) we are concerned with how far local organisations can rework these relationships to the benefit of the poor.

The following section is a discussion of two broad types of agricultural development policy and their implications for the livelihood options open to the rural poor. In each case, it argues that one of the main limitations of the two policy contexts is weak specification of how aggregate effective demand was to be increased within rural areas, and to the benefit of the poor. This in essence reflected unclear thinking on the meso-scale links between translating the overall policy to the benefit of rural livelihoods. Related to this is the poor discrimination between the different types of support that different livelihoods require. It also

reviews some recent evidence that suggests that the balance of opinion to date is that whatever the policy, agricultural growth has tended to come more from expansion of area cultivated rather than intensification (particularly in Africa and Latin America).

The discussion then moves to the level of the regional and local economy. It focuses in particular on evidence suggesting that the impact of national policy is varied across regions. It then concentrates on three aspects of the regional economy that are particularly relevant to this discussion: the factors favouring agricultural intensification; the links between on and off-farm employment; and mechanisms that (i) favour reinvestment of rural profits in rural areas, and (ii) increased aggregate demand within rural areas.

The paper closes by drawing out some of the implications of this evidence for policies to support the intensification of rural livelihoods.

RURAL LIVELIHOODS AND AGRICULTURAL DEVELOPMENT POLICY: RETHINKING THE LINKS

Anthony Bebbington

The argument of this paper is simple: if agricultural policy is concerned to address the needs of poor people, and to intensify their livelihoods (see Bebbington et al, 1993), then frequently its concerns must also lie beyond the farm. This is so for several reasons. Firstly, for those poor households who have the option of improving their livelihoods through agricultural intensification, the likelihood of this occurring depends primarily on the existence of an environment in which the returns to labour invested in agricultural intensification exceed the returns to other livelihood opportunities. Cases in which farmer led (or "autonomous": Lele and Stone, 1989) intensification has occurred show that this occurs not so much because of the presence of research and extension or other such services (though the existence of appropriate technology is crucial). Rather the existence of market possibilities and access (defined in social as well as physical terms) are particularly important. Agricultural intensification depends therefore mainly on increased effective demand for poor peoples' agricultural products. While liberalisation programmes may be a necessary precursor to this, research shows that per se liberalisation will be insufficient, and needs the complement of rural investment programmes (for Africa see Duncan and Howell, 1992: especially pp 199-208; and Latin America, see de Janvry and Sadoulet, 1989).¹ Indeed, it can be strongly argued that now under liberalisation the macroeconomic context is more conducive to rural investment than ever it was under macroeconomic policies which did not favour agriculture.

Secondly, recent studies (IFAD, 1992; Carroll, 1992; Riddell and Robinson, 1993) have argued that it is extremely difficult to target the poor with income generating projects - whether these are agricultural or not. This is so for a number of reasons: insecure resource bases, unstable livelihoods, etc. If this is so, then it may be the case that a more viable and effective way of assisting the very poor (excluding those physically unable to work) is by aiming to create an environment where overall demand for rural labour and products grows.

Thirdly, there are many poor rural households who have no means of escaping from poverty through agricultural intensification - indeed if they attempt to do so then in many cases their actions may aggravate environmental degradation (Leach and Mearns, 1992; Lele and Stone, 1989; Bebbington, 1993). In order to address the needs of these households, which represent a rapidly growing group (e.g. de Janvry, Sadoulet and Wilcox, 1989; Haggblade et al, 1989), then agricultural and natural resources (NR) policy must work with the objective of supporting livelihood intensification rather than simple agricultural intensification. This implies a differentiated policy that provides a range of options to the rural poor - agricultural

¹ Investment does not mean only infrastructural investment but the package of investments that broadly fell under the "urban functions in rural development" approach toward rural development - developing marketing centres, bulking and storage facilities etc (Rondinelli, 1983; Gore, 1984). It also implies investment in rural human resources.

options to those smallholdings that are still potentially viable units, and employment options to those who are not. Such a strategy boils down to combining research, extension, credit etc support to viable smallholdings, and then for the landless and chronically land poor promoting employment opportunities in rural areas through particular sorts of labour intensive agricultural development through identifying specific production and service provision possibilities for the functionally landless (Wood and Palmer-Jones, 1990), or through creating demand for labour in off-farm stages of the food system (eg processing, marketing etc). Mass employment programmes (as in India) also have a role although they fall beyond the mandate of NR policy.

These two strategies are synergistic: increasing livelihood opportunities for the rural poor will, by increasing their incomes, foster increased demand within rural areas for rural and agricultural products, thus improving the environment for agricultural intensification on the viable smallholdings. It is also more probable that it will encourage a form of accumulation in which profits tend to be reinvested within rural areas, in employment generation and land improvement, perhaps above all by the emerging stronger smallholder class. In the short term this reinvestment will come from those producing those products - in the longer term it may come also from those poor who have been able to accumulate funds beyond those needed for food purchase.

To make this argument, the paper has the following structure.

The paper opens with a discussion of recent thinking on sustainable rural livelihoods. It links this to a framework which can help us think through the linkages between different levels of action and analysis. More specifically, the framework concentrates on the linkages between national, regional/local and livelihood levels. This orients our attention to the different types of action required to support and intensify different types of rural livelihood. In this paper we are particularly interested in how the implications of these interrelationships for poverty-oriented policy interventions. In another paper (WP8) we are concerned with how far local organisations can rework these relationships to the benefit of the poor.

The following section is a discussion of two broad types of agricultural development policy and their implications for the livelihood options open to the rural poor. In each case, it argues that one of the main limitations of the two policy contexts is weak specification of how aggregate effective demand was to be increased within rural areas, and to the benefit of the poor. This in essence reflected unclear thinking on the meso-scale links between translating the overall policy to the benefit of rural livelihoods. Related to this is the poor discrimination between the different types of support that different livelihoods require. It also reviews some recent evidence that suggests that the balance of opinion to date is that whatever the policy, agricultural growth has tended to come more from expansion of area cultivated rather than intensification (particularly in Africa and Latin America).

The discussion then moves to the level of the regional and local economy. It focuses in particular on evidence suggesting that the impact of national policy is varied across regions. It then concentrates on three aspects of the regional economy that are particularly relevant to this discussion: the factors favouring agricultural intensification; the links between on and off-farm employment; and mechanisms that (i) favour reinvestment of rural profits in rural areas, and (ii) increased aggregate demand within rural areas.

The paper closes by drawing out some of the implications of this evidence for policies to support the intensification of rural livelihoods.

Agricultural development and sustainable rural livelihoods

The limits of agricultural growth

In its recent look at agricultural options for the year 2010, the FAO has drawn attention once again to the double edged nature of agricultural growth. It notes that the impact of agricultural growth on poverty is largely a reflection of the initial distribution of assets in the rural population. Thus, in cases where asset distribution has been highly skewed, the growth may in fact widen income disparities.

"while on balance agricultural growth can be expected to bring about reductions in rural poverty, some parts of the rural population may become worse off. The structural characteristics of the rural economy [particularly land ownership and tenure] at the inception of agricultural growth play a predominant role in the distribution of benefits from higher production." (FAO, 1993:239)

Furthermore, they note, agricultural growth may aggravate rural poverty in fragile environments when poor families are pushed onto more marginal lands which they subsequently degrade as a consequence of the conditions under which they have to produce and survive. Consequently, the FAO concludes, in the end non-agricultural growth and a decline in agriculturally dependent populations will be essential for any significant amelioration of rural poverty (FAO, 1993:243).

This last point points toward a later part of the argument in this paper. The initial message that comes from this FAO review is any agricultural growth strategy, and any strategy aiming to foster the intensification of agriculture, will probably create winners and losers, and that if one objective is to support particular winners, then programmes will have to pay great attention to how best to target these groups, and what other changes (such as asset distribution) will be necessary for those groups to benefit from intensification and growth. Lest there be misunderstanding, to talk of changes in asset distribution is not only to talk of land reform - although there are instances where land reform is feasible. Strengthening the rural poor's assets and claims can also be achieved by regularising land tenure on customary lands threatened by others (e.g. Brazil), by increasing their knowledge of market and institutional resources, by protecting access to water, trees etc.

In its concern for assets, claims and entitlements, this vision from "above" has come to a similar set of concerns to the more populist visions from "below," on how the livelihoods of the rural poor can be enhanced and made more sustainable. This is discussed in the next section.

Sustainable rural livelihoods: a quick review of a concept

The concept of sustainable livelihood was first elaborated in the WCED Advisory Group on Food Security. The definition offered was as follows:

"Livelihood is defined as adequate stocks and flows of food and cash to meet basic needs. Security refers to secure ownership of, or access to, resources and income earning activities, including reserves and assets to offset risk, ease shocks and meet contingencies. Sustainable refers to the maintenance or enhancement of resource productivity on a long-term basis. A household may be enabled to gain sustainable livelihood security in many ways - through ownership of land, livestock or tree: rights to grazing, fishing, hunting or gathering: through stable employment with adequate remuneration: or through varied repertoires of activities." (WCED, 1987: 2-5).

In the same year Robert Chambers (1987) offered his personal elaboration of the concept, by arguing that any concern for a more environmentally sound form of development must begin from where the rural poor already are. In short, from the livelihood strategies they pursue. These strategies will be very varied. Few poor rural households will depend only on agricultural income and many will depend mainly on off-farm and migratory employment. This starting point would therefore make us more aware of the multiplicity of rural livelihoods, and of the fact that traditional agricultural research and extension will be able to offer direct help to some than to others. It would also allow us to understand the motivations, the constraints and the opportunities leading to a particular livelihood strategy. It would also show us why in some cases the rural poor degrade the environment "rationally, and sometimes rationally in desperation" (Chambers, 1987).

In a recent paper, Chambers and Conway (1992) have developed these earlier points in a more elaborate and useful framework that provides one of the starting blocks for the framework in this paper. In this version of the concept, a livelihood becomes the capabilities, assets and activities for a means of living. Assets are divided into two types:

- tangible assets (e.g. property in natural resources and stocks of food, money and materials that have been accumulated over time); and
- intangible assets, which are divided into claims (the ability to make legitimate and effective demands on other people, institutions, government etc) and access (namely the opportunity to use a resource, service etc). These intangible assets are thus similar to Sen's "entitlements" (Sen, 1981) except that they refer not only to claims that can be made on the state, but also to claims that can be made through drawing on social relationships within the household, the local community and on other organisations and institutions that are non-governmental (cf. Gore, 1993).

The capabilities of rural people are what their skills and knowledge allow them to do with these assets.

A sustainable livelihood becomes one that can (i) cope with and recover from stress and shocks, (ii) maintain or enhance its capabilities and assets, (iii) provide sustainable livelihood

opportunities for the next generation, and (iv) contribute to the improvement and sustainability of other livelihoods.

Reading between the lines of Chambers' and Conway's paper, a strategy promoting sustainable livelihood development is one whose main focus is on increasing the rural poor's ability to choose livelihood options through guaranteeing their ability to exercise choice, widening the basket of choices available and reducing barriers to choice (such as lack of information).² The choices might be agricultural - such as a wider range of seed types - but may also be off-farm choices - such as those made available by rural employment and public works schemes (as in India). The other principal component of such a strategy is that it will concentrate on enhancing the resilience of poor people to withstand shocks and stresses, and to recover from these.

In this context, Chambers and Conway imply that an agricultural development strategy concerned to strengthen the livelihoods of the poor should, therefore, recognise that there are perhaps two main dimensions to programmes that aim to intensify and sustain rural livelihoods (1992:8-17). One revolves around strengthening peoples' assets and their ability to claim them. The other revolves around promoting economic and agroecological linkages that increase productivity and reinvestment. In the economic sphere, the challenge, they suggest, is to identify the types of linkage that increase local opportunities for rural income and that increase demand in the local economy for labour (1992:23-25).

A political ecological framework for sustainable livelihoods

The Chambers and Conway framework points us towards the need to understand the links among local people, and between them and other people, decision makers and processes at the regional, national and indeed international levels before we can identify the most appropriate natural resources strategy. They do not however elaborate this framework.

Another approach to land use, intensification and degradation is helpful in this regard. Work by Blaikie (1985) and Blaikie and Brookfield (1987) has emphasised that we can only understand the dynamics of land use and appropriate responses if we are aware of the ways in which decision makers and policies at different levels influence resource user decisions and options, and that different factors appear most important at different levels of analysis (Figure 1; Figure 2). This so called "political ecological" approach, that takes on the concerns of political economy and ecology, has become increasingly influential over recent years (Bryant, 1992).

This chain of explanation would thus trace the links between how, for instance, a small farmer decision to plant a particular crop on a steeply sloping field in a way that ultimately leads to erosion is influenced *inter alia* by the agroecological characteristics of the field, the prices of crops and labour in the local market, the price of labour in migrant labour markets, national food price policy and the relationships between consumption patterns and the structure of food imports. This might then lead to the recognition that efforts to promote the

² This is so for both current generations and future generations of the rural poor.

cultivation of particular crops or the use of particular conservation strategies is unlikely to succeed even though traditionally they seem to be small farmer crops and techniques that are adapted to the local environment (e.g. Treacy, 1989; Erickson and Candler, 1989; Bebbington, 1993)

Likewise, the chain of explanation would trace the links between the different levels and the capacity of the rural poor to strengthen their claims and to accumulate stocks that enable them to withstand shocks. Thus, for instance, the likelihood of the poor claiming access to research and extension support depends on how far national policy endorses the idea of right of access, or creates mechanisms favouring such access. It also depends on the management style of regional research and extension managers, and how far the institutional culture they create promotes and values responsiveness to resource poor farmers.

Figure 1

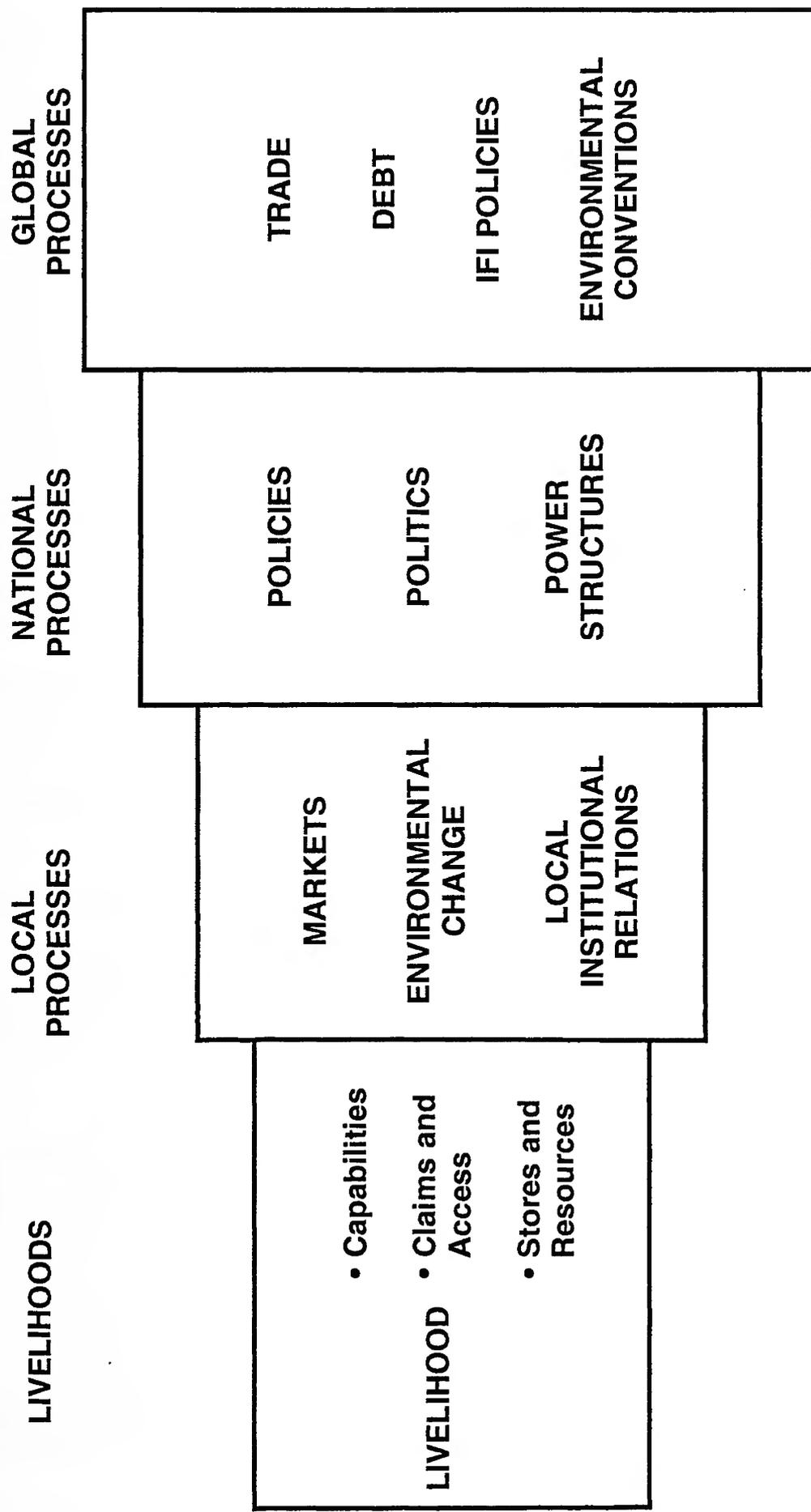
**Levels of analysis in analyzing
land use sustainability**

SCALE	WHO DECIDES	FACTORS
field/farm/ community	individuals and small groups	agroecological
regional	traders state land registry landlords	local market relationships physiography property relations settlement history
national	elites policy makers	class relations economic/political /administrative context
international	GATT negotiators northern political decision makers	world economy commoditisation

Source: Adapted from Blaikie and Brookfield, 1987.

Note: The lists of "who decides" and "factors" are illustrative rather than exhaustive.

Figure 2
Livelihoods in policy context



While the framework is useful for organising our thinking, the emphasis of the Blaikie and Brookfield approach can be usefully amended in several ways.

Firstly, there is a tendency in political ecological work to emphasise that "higher level" systems are sources of constraint on farmer choice. It is important to recognise that, for instance, the regional and national economy are also "resources" for the rural poor, and the challenge is to identify ways in which they can be made more supportive to the livelihood strategies of the rural poor.

Secondly, we should not only follow the chain "downwards" so to speak: ie from policy to livelihood. We should also be interested in the ways in which rural people can reach upwards so as to influence how, for instance, the regional economy functions, how land rights are defined and protected, how research resources are allocated etc. Policy should therefore not be confined to looking at how to intervene but also how to strengthen the abilities of rural people to influence markets and institutions so as to protect their assets and increase their tangible assets (eg savings). This implies that a strategy to strengthen rural livelihoods would also have to consider the potential roles for: strengthening local institutions, strengthening claim making regulations; influencing governmental and non-governmental organisations so that they become more open to claim making; training in negotiating markets for natural resource based products; and training to increase the quality of rural people's labour and thus their capacity to sell it for natural resource related activities.³

The remainder of this paper concentrates on particular aspects of this chain of explanation of direct relevance to NR policy. In the next section, we look at the macroeconomic context of agricultural policy and its implications for poor peoples' rural livelihoods. We then move down the hierarchy of levels and look at questions related to the regional and local economies.

Agricultural policy and rural livelihoods

In very broad terms, agricultural development policy has taken two broad approaches, which can in many regards be divided as pre and post-structural adjustment. Each approach has generated winners and losers in the rural economy, and in each approach the rural poor have often lost out.

Pre-adjustment agricultural policy

Agricultural policy in the period prior to the implementation of economic reform programmes was characterised by state centred approaches to economic and agricultural development. In these, the role of the agricultural and rural sector was to support an urban and often industry-

³ This discussion is related to the themes dealt with in another unifying theme paper that addresses the relationships between local institutions and research and extension systems and considers how these relationships can be strengthened so as to increase rural peoples' ability to exercise demand pull on these organisations.

based approach to economic development. Agriculture would generate a surplus that would be transferred, usually through the state or parastatals, for industrial and urban investment. At the same time, there was a need for cheap urban food in order to keep labour costs down. This would assist industry, and ensure political calm.

The technological backbone of this strategy were agrochemicals, new varieties, mechanisation, irrigation etc. Institutionally, it encouraged the creation of government interventions or the deepening of interventions that already existed. These are familiar: targeted subsidies and overvalued exchange rates to subsidise the cost of imported machinery and inputs; subsidised credit to aid purchase of inputs; institutions to deliver credit, technology and technical assistance; parastatals and marketing boards to purchase farmer produce and sell on, keeping a margin for the state etc.

The limitations of these programmes, such as the bias of the technologies and the inefficiencies of government institutions, are well rehearsed. More relevant for our purposes were their implications for the poor. In general terms, these were policies for the urban rather than the rural poor - or rather for the net-food consuming rather than the net-food producing poor. The disadvantages for the rural have included, among others, the following:

1. Technologies tended to be more adapted to the better lands that were traditionally controlled by wealthier farmers (Yapa, 1977; Lipton with Longhurst, 1989), although some of the initial criticisms of biases of the modern technologies were subsequently qualified (Rigg, 1989).
2. Whilst high-yielding varieties had the potential to increase demand for labour, the extent to which they allowed absorption of poor peoples' labour depended on local asset distribution and in areas where this was unequal larger farmers over time sought out means to introduce labour displacing machinery (Lipton with Longhurst, 1989); in other cases, the bias toward subsidised machinery was a labour displacing policy;
3. The existence of "urban-biased" (Lipton, 1977; but see Varshney, 1993) policies, particularly ones subsidising food prices, made the accumulation of surplus difficult for rural food producing families, and often reduced incentive to innovate by keeping product prices and profit margins low (de Janvry, 1981);
4. The existence of institutions (such as marketing boards) that favoured towns and urban consumers and that deliberately controlled prices in order to capture a surplus for state use (Bates, 1981). These were coupled with policies favouring classes who transferred surpluses townwards (Lipton, 1993), and which restricted the possibility of rural accumulation and rural investment;
5. Restrictions on private rural investment meant less likelihood of investment in activities that would generate demand for rural labour, rural services and rural products. In this sense they reduced the chance that the basket of livelihood options for the rural poor would grow.

Viewing the biases in this light, rather than as simple technology biases, draws attention to the broader issue of the impact of this package of agrarian policies on the rural economy.

By *tending* to favour the transfer of profits out of the countryside, by *tending* to put a constraint on how far rural incomes could rise, and by *tending* not to absorb a growing rural population and in some cases to displace labour, any growth in demand for rural products and labour, and any strengthening of linkages within the rural economy was restricted.

As recent work has suggested, in the future poverty oriented agricultural development must base itself on enhancing the demand for rural labour, services and products (Lipton, 1991; Chambers and Conway, 1992; de Janvry and Sadoulet, 1989). If food insecurity, and poverty in general is an effect of undermined entitlements (Lipton and Longhurst, 1989), and income and market access are two sources of stronger entitlements, then such rural growth is also an important factor in strengthening poor peoples' entitlements.

Structural adjustment and the African (Asian and Latin American) farmer⁴

Over the last decade, agricultural policy has been dominated by adjustment measures. In part these were designed to address some of the problems noted above. In particular, the removal of price controls and food subsidies, and the devaluation of exchange rates were intended to create a more favourable environment for agriculture. Indeed, various to assessments of the impact of these policies suggest that this has in general terms been the effect (FAO/ILAS, 1993; de Janvry and Sadoulet, 1989; Lele, 1989; Duncan and Howell, 1992). However, these assessments show that there is also much variation around the mean. In large measure, this variation reflects differential ability of different regions and different rural groups to respond to the new environment, and also the extent to which rural people are net food producers or not.

Two recent studies of the performance of African agriculture under adjustment are important for this discussion, not least because they cover a range of countries and come to similar general conclusions. These are the Managing Agricultural Development in Africa (MADIA) study at the World Bank (Lele, 1989), and IFAD's study on the Impact of Economic Recovery Programmes on Smallholder Farmers and the Rural Poor in Sub-Saharan Africa (Duncan and Howell, 1992).⁵

The MADIA study looked not only at the implications of adjustment programmes, but also at the performance of agriculture since independence. The general conclusion was that agricultural growth is dependent on price incentives, but not only on these: government commitment, resource endowments and technological possibilities are all of equal importance. Perhaps most significant in determining the success of donor efforts to foster this growth, however, was the extent to which programme design and adaptive management was based on local knowledge.

⁴ A play on the title of a recent review of the impacts of adjustment on the African farmer (Duncan and Howell, 1992).

⁵ The MADIA study covered Cameroon, Kenya, Malawi, Nigeria, Senegal and Tanzania: the IFAD/Duncan and Howell study worked in Ghana, Kenya, Madagascar, Malawi and Niger.

"Our analysis suggests that the extent to which donors have successfully contributed to growth processes seems fundamentally to depend on the extent to which they understand the myriad microlevel constraints on growth prospects in particular projects and subsectors all the official studies contributed by donors emphasise the extent to which the effectiveness of external assistance has been undermined by the donor's limited ability to anticipate important aspects of the local conditions under which their programs operate, and to take account of the impact of microlevel constraints" (Lele and Stone, 1989:113).

Lele (1989) suggests that one of the reasons that donors have not taken these local factors seriously is a concern for quick results.

Duncan and Howell (1992:201) similarly observe that although improvements in the terms of trade for agriculture can benefit smallholders this does not always occur. In some cases (eg Malawi) the bias of agricultural services to the large estates marginalises smallholders. Also smallholder benefits accrue primarily to those who produce export crops. Among the most critical factors determining smallholder ability to respond to the new incentives are: (i) the availability of rural infrastructure, especially roads, without which marketing and service provision are costly; and (ii) the development of the private sector. Where this is weakly developed, monopolistic and monopsonistic tendencies emerge, again to the particular disadvantage of smallholders: "[t]here is a clear risk that freer [ie liberalised] distribution may not improve access to inputs among rural households, especially those isolated from the main distribution networks" (1992:204).

All the country studies in the Duncan and Howell (1992) collection also demonstrate that "substantial groups" (p. 206) of the very smallest rural producers, "especially those with the lowest incomes" are least likely to benefit from economic liberalisation. This is because either (i) they produce primarily non-tradables, and only small surpluses of tradable crops, and/or (ii) are net food buyers.

These same patterns appear to apply in Latin America and the Caribbean. The crisis of the 1980s and in some cases early 90s, an effect of both runaway inflation and often harsh adjustment measures, led to reduced rates of growth in all sectors of the economy. However, agriculture became the most dynamic sector of most LAC economies, growing at a rate double that of the economy as a whole (Table 1). Yet at the same time, the FAO notes "the incomes of the rural poor declined despite considerable increases in aggregate agricultural production" (FAO, 1993:237).

Table 1: Latin American performance in agriculture

	Annual growth rates (percent)	
	1970-1980	1980-1986
Gross domestic product	5.2	1.0
Agriculture	2.7	1.9

Source: de Janvry and Sadoulet, 1989:1204

The rural poor in Latin America have failed to benefit from liberalisation for reasons that are similar to those in Africa. The story of weakening of rural services, finance and technical assistance is the same (Bebbington and Thiele, 1993). More critically, in many cases, people are landless, or landholdings are so small that rural people are net food buyers (ILDIS, 1990; de Janvry and Sadoulet, 1989). These net food buyers are dependent on income derived from off-farm employment, often as periodic migrant labour. Many of the sectors in which they worked have been severely affected. Consequently, the assets of the rural poor have been undermined, and with that their food security.

Overall, the implications of these African and Latin American reviews is that the current policy context has not led to any significant increase in demand for the products, services and labour of the rural poor within rural areas. Furthermore, those who have benefitted are a similar group to those who benefitted before: those with land assets, with access to markets, with information on markets, and with effective access to services.

There is an interesting convergence between the Latin American, African and Asian assessments when it comes to policy recommendations: in a nutshell this is that it is important to prioritise those policies which do most to stimulate demand for labour (de Janvry and Sadoulet, 1989; Howell and Duncan, 1992; Lipton, 1991). Similarly, there is agreement that agricultural policy must be complemented by targeted interventions to assist poor rural people in supply response and in labour market participation. Specific interventions are needed to strengthen input providing organisations, rural financial markets, research and extension.

Other important implications of these studies are that:

1. As in prior agricultural policies, the extent to which different rural producer can take advantage of the new environment depends in large measure on their initial assets. Not only their material assets, but perhaps more importantly their ability to gain access to information on, and entry into markets, their ability to respond flexibly to new market opportunities, and their access to credit and support services.
2. Policy change at a national level is not automatically translated to a local level. Rural institutions and infrastructure are required in order to take advantage of new contexts.
3. As Lele (1989) notes, we need to differentiate between developmental shortcomings (eg price distortions) which can be corrected through SAPs and structural impediments to growth (eg socio-political factors, institutional and management weaknesses) which it is much more difficult for adjustment programmes to address, and which must be addressed if rural growth is to occur.
4. Policies are no substitute for programmes based on an understanding of the sorts of political and technological factors that will determine the impact of a policy in a particular place, and that indeed will influence the formulation of policy in the first place (Gass et al, 1993). Lele and Stone (1993:113) argue "time and again ... historical and situation-specific constraints [are critical] and [there is] pressing need for a greater institutional memory and a better understanding of socio-political and technological factors" if adjustment related agricultural policy is going to lead to patterns of growth that improve equity.

5. Currently the context is more favourable for agriculture than it has been in the past. This means that now more than ever before investments in rural infrastructure, institutions and services have a greater chance of benefitting the livelihoods of the rural poor (de Janvry and Sadoulet, 1989; Lele and Stone, 1989). The irony is that the logic of adjustment has usually led to a weakening of these institutions, and cutbacks in any such expenditure.⁶

The following section elaborates certain points raised by this discussions:

1. the factors determining the likelihood and distributional implications of smallholder agricultural intensification
2. the role of off-farm employment in the livelihood strategies of the rural poor;
3. ways in which agricultural and rural development strategies could be adapted to cater for two particular types of rural poor household: those with the potential to build a livelihood on agricultural production, and those for whom agriculture does not offer a way out of poverty (de Janvry and Sadoulet, 1989).

In our hierarchy of levels, this takes our discussion to regional and local levels.

Regional factors in livelihood intensification: agriculture, employment and investment

Agricultural intensification for small farmers

Success stories

A number of studies have recently argued that African farmers from a wide range of African countries have shown great propensity to intensify autonomously.⁷ They tell stories of landscape transformations on the Nigeria's Plateau (Netting, 1993), in Kenya's Machakos (Tiffen et al, 1993) and Burkina's Mossi Plateau (Batterbury, 1993). These are transformations in which degraded or poor land is recovered and improved, through large investments of labour and capital and in contexts of rapid population increase.

However, as some authors acknowledge explicitly, these cases of intensification have reflected particular circumstances rather than general ones. One set of special cases are those where areas have privileged access to markets. The transformations in Machakos, for instance, reflect proximity to a large market and easy road access, making the returns to labour investment in land transformation (such as terracing) higher than those to out-migration.

In other cases, intensification is a response to loss of access to land. In the middle Atlas of Morocco, Bencherifa and Johnson (1991) report a shift among the Ait Arfa from pastoralism

⁶ It is also true that some of this weakening reflects the passing back of jobs and services that were not sustainable and that depended on donor support for their survival.

⁷ Tiffen et al, 1993 (Kenya); Netting, 1993 (Nigeria); Turner et al (Nigeria, Kenya,); Bencherifa and Johnson, 1991 (Morocco); Manger, 1987 (Sudan); Batterbury, 1993 (Burkina Faso).

to agropastoralism and more intensive livestock management. The intensification was induced by state legislation that prevented overlapping land rights on previously shared grazing lands, and by an expansion of more powerful commercial farming interests that took de facto control of land previously used by the Ait Arfa for extensive grazing. By the same token, when such forcing factors are removed, agriculture may well de-intensify again, as Manger (1987) reports from Sudan.

These cases and others are helpful because we can draw lessons from them regarding the sorts of factors that favour intensification. These include easy market access, loss of land, and strong cultural identification with rural life. And in all cases, intensification is only possible when there is availability of technology (this is a necessary but not sufficient factor in intensification).

The limits to intensification

However, we cannot expect these processes to be reproduced everywhere. Indeed, the MADIA studies came to rather more cautious conclusions regarding farmer led intensification. MADIA concluded that the sources of post-independence agricultural growth in Africa were, in order of priority:

- (1) expansion of cultivated area
- (2) changes in cropping patterns and
- (3) yield increases, but to a far lesser extent.

That is to say, they concur with Oram (1987) that little growth had occurred due to intensification. However, it may be that new technologies did avert productivity declines that would otherwise have occurred due to erosion etc (Gilbert, pers. comm., 1993).

Experiences are similar in Latin America. Yet in both regions, cultivable land that is not fragile is growing scarce, and in the future growth must depend on increased cropping frequency and/or yield per unit area - i.e. intensification.⁸ Furthermore, much of this intensification must occur on small farms. Smallholders produce significant quantities of many food crops and some export crops (Jordan, 1989; Duncan and Howell, 1992). They therefore have an important role to play in any effort to sustain growth in a context of increasing population.

Notwithstanding the arguments of Boserup (1965), and even more recently Paul Richards (1985, 1986), there is now sufficient evidence to show that population increase per se will not lead to agricultural intensification. Early elaborations of the Boserupian argument suggested that intensification could also be an effect of sources of demand other than direct demand from increased population (Brookfield, 1972, 1984). Brookfield argued that these sources could be market demand (as long as farmers were oriented to accumulating cash profit through market production) and taxation.

⁸ Thus, they argue for instance that despite East Africa's (Kenya's) historical strength in high potential land, the situation is in fact gravest in those areas of high potential because there is little land left to colonise, and degradation is already accelerating on that land (p16).

One of the conclusions of the MADIA studies was that not even the combination of market demand and population pressure was sufficient to ensure intensification (Lele and Stone, 1989). They offered two main sets of reasons why this was so:

1. **population-environment reasons.** Among the reasons why intensification may not occur are the following: that the environment is too fragile; constraints to production are increasing (eg shifts in rainfall); or population increase is exceptionally rapid. Indeed, they argue that the main failing of the Boserup thesis is precisely that it does not deal with situations in which demographic increase is so rapid that the environment breaks down before land improving intensification occurs.⁹
2. **political reasons.** The concentration of political power can be such that smallholder ability to respond to demand is obstructed.

Consequently, they echo Pingali and Binswanger's (1984) conclusion that farmer based innovation in sub-Saharan Africa will not be sufficient to cope with rapid population increase, and that more generally market led intensification will rarely be sufficient. Therefore policy led intensification will be necessary in many instances.

"The salient point is that public policy plays a crucial role in the intensification process and that regional expenditures are an effective way of guiding the autonomous forces that arise out of population growth" (Lele and Stone, 1989:34).

However, this is not to say that agricultural support programmes will automatically foster intensification. One global overview of the factors influencing how agriculture responds to increased population pressure identifies a long list of critical factors (Bilsborrow, 1987). These are:

1. level of living - ie is there room for reduced consumption levels, or in Geertz's terms (1963) is there scope for "involution" in which the response to pressure is to share poverty rather than to increase production
2. availability of new cultivable land
3. availability of off-farm rural employment
4. availability of urban employment
5. the potential for labour intensive, land saving technological change
6. flexibility within existing cropping system
7. the existing ratio of rural:urban population. Where this is high, then urban areas have a smaller absorptive capacity
8. fertility levels and the strength of cultural practices that determine them
9. size and distribution of land holdings
10. institutional structure (credit, agrarian structure etc)

While some of these factors are the stuff of policy-led intensification (e.g. research, extension and then credit to support the adoption of land saving technologies; secure land tenure), others

⁹ They acknowledge that Boserup does mention that intensification may not occur under conditions of rapid population increase.

determine the likelihood of these policies being effective. Bilborrow draws attention to the fact that the likelihood of farmer intensification depends on the broader regional economy. If returns to labour are higher in migrant labour markets, then migration may be the preferred option; if returns to migrant labour fall, then intensification may occur.

The policy implication of this is that any effort to promote intensification must look at the potential returns to labour off the farm in order to assess the likelihood that farmers will respond to programmes. Treacy (1989) reports efforts to promote terracing that have failed because the rural poor could earn more by migrating. Also, the absence of labour in the fields on a more routine basis prevents the sorts of casual maintenance of intensifying works such as terraces and irrigation channels (Doolittle, 1984). Conversely, Batterbury (1993) reports that much of the transformation of parts of the Mossi plateau in Burkina Faso, recovering once degraded land and making some of it once again productive, was a consequence of the declining returns to young men's migrant labour. However, this could occur only when those individuals retained rights of access to land and its products. They therefore have decided to stay "at home" and attempt to build an agriculturally-based livelihood.

The issue is not only one of returns to labour. It is also one of demand. Out-migration means land use does not have to respond to demand, and thus intensification is less likely. Salehi-Isfahani (1993) therefore argues that in cases where out-migration (for instance to mines) occurs before an intensification process is initiated, then the potential for intensification becomes even more limited. Furthermore a vicious cycle is set in train: failure to intensify reduces the capacity of agriculture to absorb labour; population increase therefore leads to yet more out-migration.

The implication of these points is that one important means of fostering intensification is through:

1. influencing the internal terms of trade so as to make labour investment in agriculture potentially more rewarding, at the same time as supporting intensification more directly through services;
2. increasing effective demand in rural areas for agricultural products.

Increasing effective rural demand can occur in a number of ways. One mechanism which is particularly apt for a policy-seeking agricultural development and poverty alleviation, is through enhancing the incomes of non-landowning or net-foodbuying families in rural areas so that they purchase food and other goods within rural areas. It is in this regard that there is a clear synergy between attempts to foster intensification on viable smallholder units, and to increase income generating possibilities for the most land-poor allowing them to purchase foods from the smallholdings. Without this income, the land-poor would also be obliged to migrate, thus taking their effective demand with them out of the countryside, increasing the likelihood that they will consume imported foodstuffs in urban areas and placing further pressure on urban services and infrastructure.

The distributional impact

Intensification in the aggregate does not imply that the poorest, or that all sectors of the rural poor benefit. This point is dealt with in more detail in a subsequent paper that considers the role and limits of local institutions in feeding information back to a research programme. For this paper several points merit emphasis.

1. most discussions of intensification draw attention to the fact that the process is often accompanied by competition over access to resources (particularly land, trees and water), in which stronger interests often emerge with more control over resources (Bencherifa and Johnson, 1991; Carney, 1988; Webb, 1989; Berry, 1987);
2. intensification can lead to efforts to redefine rights in land in order to ensure that some groups gain most. Carney (1988) and Webb (1989) report how this occurred in the Jahaly Pacharr irrigated rice scheme in the Gambia which deliberately aimed to target women, but failed to do so because men were successful in redefining land rights so that they gained control of irrigated rice lands;
3. anticipation of these sorts of conflict and insecurity of rights can be a disincentive to some to intensify as they cannot be sure they will enjoy the fruits of any investment in land (Berry and Okali, n.d.)

These observations imply once again that any scheme that aims to foster intensification, and deliberately target certain groups, must - as Lele reminds us - be very sensitive to the "myriad" local social and political relationships.

On the other hand, the observations do not mean that all interventions will be entirely usurped by the powerful people and groups in a particular locality. In all the cases noted above the poor also benefited, but not as much, or in the way that was initially intended by the project planners.

Rather the implications of these findings are that:

- (a) pre-project appraisals must consider carefully how power is organised and used in communities, and what room for manoeuvre that allows a project aiming to benefit the poor. In certain extreme cases, where the local elite are very strong, it may be that the best way is to foster labour intensive development on the properties of this elite;
- (b) project monitoring mechanisms are needed that will identify such cooptation when it occurs. This implies - perhaps - a participatory monitoring in which different interest groupings in a village assess the on-going impact of the project on their livelihoods;
- (c) as far as possible, implementing organisations must decentralise decision-making to a level more able to identify and respond to these relationships. They must also encourage local functionaries to address such questions. On the other hand, there is evidence that decentralization can encourage a form of local patronage or allegiance between officials and local elites or favoured interests (Graham, 1992). Thus decentralization for "adaptive

planning" (Holling, 1978) must be accompanied by mechanisms of accountability to "the centre" that reduce the likelihood of such cooptation.

NR intensification and the rural landless and land scarce

As noted, Chambers and Conway argue that any effort to strengthen rural livelihoods is more likely to be successful when based on an understanding of existing livelihood strategies. In many cases these depend largely on non-farm income sources. A few specific Asian cases point to this pattern. A study in Bangladesh, for instance, has found that only 37 % of household income came directly from agriculture, 44% from labour and 19 % from business and services (Magor and Orr, 1990). In the area of the Kribhco project in India between 40 and 60 per cent of the rural poor migrate periodically to cities (Mosse, 1993). Finally, in the hinterland of one large international NGO project in Bangladesh some 70% of the population were landless or highly marginal farmers. Data from Africa and Latin America point to similar patterns. In Latin America, between 20 and 40% of the rural economically active population does not work in agriculture (Table 3), and landlessness is often severe (Table 4). Similarly, a series of case studies show that families owning small farms often derive less than 50 per cent of their income from farming (Table 2). A similar overview of case study material from Africa suggests slightly higher percentages of income from farm activities (Table 5).¹⁰ However, this study is an estimate of income for all the rural population and not only the smallest land owners. Had it been focused only on the smaller land holding families, then percentages of total income from agriculture may have been smaller. Nonetheless, the general impression is of non-farm income providing 25-30 per cent of total income and 30-50 per cent of cash income (Haggblade et al, 1989:1177).

¹⁰ These African and Latin American overviews are based primarily on data from the 1970s. This would imply that if anything the share of rural income from non-farm sources has increased yet further.

Table 2: Sources of rural income in Latin America

Region	Year	Farm size (hectare)	Share of farm households (percent)	Shares of income derived from:		
				Farm	Wages	Other
Cajamarca (Peru)	1973	0-3.5	72	23	50	27
Puebla (Mexico)	1970	0-4	71	32	58	11
Garcia Rovira (Colombia)	1972	0-4	20	79	16	5
South Bolivia	1977	0-5	67	38	62 •	
Region IV (Chile)	1976	0-5	59	47	40	13
Vertentes (Brazil)	1979	0-10	16	—†	56	—
Northwest Altiplano (Guatemala)	1978	0-3.5	85	29	59	12
El Salvador	1975	0.2	71	64	27	9
Sierra (Ecuador)	1974	0-5	77	37	44	19
Coast (Ecuador)	1974	0-5	77	48	41	11
Chamula (Mexico)	1973	—	—	11	89 •	

Source: de Janvry, Sadoulet and Wilcox (1986).

• Sum of wages and other.

† Dashes indicate no data available.

Source: de Janvry and Sadoulet, 1989:1212

Table 3: Growing integration of agricultural and urban labour markets in Latin America

Country	Year	% share of agricultural EAP in urban areas	% share of rural EAP working in non-agriculture
Brazil	1970	12.3	15.2
	1980	17.7	23.4
Pernambuco	1970	13.1	—
	1980	16.3	—
São Paulo	1970	26.6	—
	1980	38.0	—
Costa Rica	1963	5.4	29.1
	1973	6.2	41.2
Ecuador	1962	6.5	19.3
	1974	6.8	26.4
Mexico	1970	23.8	23.1
	1980	26.0	42.4
Nicaragua	1963	11.0	12.8
	1971	11.7	20.0
Peru	1961	18.3	20.1
	1972	23.7	18.8
Puerto Rico	1960	6.5	56.1
	1970	11.8	80.8

Sources: For Brazil and Mexico, censuses for 1970 and 1980; for other countries, United Nations, Department of International Economic and Social Affairs: Patterns of urban and rural population growth, Population Studies No.68 (New York, 1980).

Source: de Janvry, Sadoulet and Wilcox, 1989:714

Table 4: Extent of landlessness in Latin America

Country	Source	Year	Basis	Landless as % of basis
				61.3
Brazil	(1)	1972	Rural households	
Chile	(2)	1965	Agricultural EAP	36.1
Costa Rica	(3)	1965/1970	Agricultural EAP	2.0
El Salvador	(3)	1965/1970	Agricultural EAP	17.0
El Salvador	(4)	1961	Rural households	12.0
El Salvador	(4)	1971	Rural households	29.0
El Salvador	(4)	1975	Rural households	41.0
Guatemala	(3)	1965/1970	Agricultural EAP	7.0
Honduras	(3)	1965/1970	Agricultural EAP	26.0
Nicaragua	(3)	1965/1970	Agricultural EAP	31.0
Nicaragua	(5)	1978	Agricultural EAP	39.6
Nicaragua	(6)	1978	Agricultural EAP	31.5
Nicaragua	(7)	1970	Rural households	32.5

Sources:

- (1) J. Graziano da Silva et al.: *Estructura agrária e produção de subsistencia na agricultura brasileira* (São Paulo, Editora Hucitec, 1980), pp.60-63.
- (2) P. Marchetti: "Reforma agraria y la conversión difícil", in *Estudios Rurales Latinoamericanos* (Bogotá), Vol.4, No.1, Jan-Apr 1981.
- (3) S. Barraclough and P. Marchetti: "Agrarian transformation and food security in the Caribbean Basin", in G. Irvin and X. Gorostiaga (eds.): *Towards an alternative for Central America and the Caribbean* (London, George Allen and Unwin, 1985).
- (4) E. Klein: "Pauperización campesina", in *Nueva Antropología* (Mexico City), Vol.IV, 1980,, pp.13-14.
- (5) International Fund for Agricultural Development: *Informe de la Misión Especial de Programación a Nicaragua* (Rome, 1980).
- (6) P. Peek: *Agrarian reform and poverty alleviation*, WEP Working Paper (Geneva, ILO, 1984).
- (7) A. Hintermeister: "El empleo agrícola en una estructura en transformación, in *Estudios Rurales Latinoamericanos*, Vol.6, Nos. 2 and 3, May-Dec. 1983.

Table 5: Share of nonfarm earnings in total rural income in sub-Saharan Africa (percent)

Country	Agricultural income	Nonfarm income
<i>A. Total rural income</i>		
Botswana (1974-75)	56-75	24-44
Ghana, Akwapim (1965-66)	58-72	14-28
Ghana, Eastern Region (1967-68)	58-82	18-42
Ghana, heads of household in Eastern Region (1967-68)	25-50	50-75
Ghana, five villages (undated)	70-84	16-30
Ivory Coast, South East Region (1963)	71	29
Kenya (1969)	69	31
Kenya (1976)	72	28
Lesotho (1977-78)	23	77*
Northern Nigeria, Kano Region (1974-75)	72	28
Northern Nigeria, Zaria Region (1966-68)	78	22
Sierra Leone (1974)	64	36
Sierra Leone (1975-76)	81	19
Tanzania (1969)	79	21
Tanzania (1975)	77	23
<i>B. Rural cash income</i>		
Ghana, Akwapim (1965-66)	55-78	22-45
Ghana, cocoa farmers (1968-70)	77	23
Ghana, Eastern Region (1967-68)	45-68	32-55
Ghana, heads of household in Eastern Region (1967-68)	17-45	55-83
Ivory Coast, Bouake Region (1970)	58-76	24-42
Liberia, Western Region (1973)	69	31
Tanzania (1969)	64	36
Tanzania (1975)	57	43
Zambia, Luapula Province (1977)	21	79
Zambia, three provinces (1982)	76	24
<p>* Remittances account for two-thirds of rural income. Domestic nonfarm income is 12% of total, or 34% of domestic rural value added.</p>		

Source: Haggblade et al, 1989:1178

Much of this off-farm income is NR related. Some derives from labour on other farms. Significant proportions derive from processing NR products. Greeley argues that postharvest activities "are still the major source of rural employment outside of direct crop production, and collectively the ancillary activities associated with them are commonly the largest rural industry" (1991:14), though this claim may be more true for South Asia than other regions. Haggblade et al (1989) similarly show the importance of income from processing of foods, timber and meat, and trade in NR related products in a range of African countries.

Furthermore - outside countries where social and religious norms might constrain female participation in economic activities - much of this processing work is often (though not always) controlled and managed by women. Off-farm work is also, almost by definition, the main income source for the landless.

However, the evidence on how far fostering non-farm employment promotes more equitable distribution of income is conflicting. The distributional impact probably depends on the case and on the activity. NR processing activities are felt to be more conducive to enhancing the incomes of the poorest (Haggblade et al, 1989). Indeed, Greeley (1991) argues that postharvest techniques are crucial to the welfare of rural poor because of their impacts on income distribution and employment and not due to effects on food losses. On the other hand, when those specific processing activities controlled by women begin to make money there is evidence that men try to take them over (Farrington, pers. com.).

The implication is that a poverty oriented NR strategy should take off-farm activities seriously. This is the more so because of the links between farm and off-farm activities. There are several such critical links.

1. Rural industry creates backward linkages for certain rural products: textiles demand fibre and wool, food processing demands food, metal handicrafts demand charcoal etc. There are also significant forward linkages from rural employment which derive mainly from the expenditure of non-farm income on rural products - mainly food, fibre and fuel.
2. There is also a reverse synergy, in that some conclude that middle sized peasant farmers are far more likely than larger farmers to spend income on labour intensive, rurally produced goods. While these multipliers appear to be lower in Africa than Asia, they are significant in both cases (Haggblade et al, 1989).
3. There is some evidence that rural entrepreneurs and industrialists are likely to reinvest profits initially within rural areas and then to small towns rather than outside the region (Bebbington et al., 1993).
4. For many small farm families without the capital or flexibility to invest in land transforming intensification (eg terraces, ditches, mounds, irrigation), in the absence of off-farm income sources, their only option is to mine land, reducing the fallow period. This is often accompanied by a grazing crisis. This leads to the reduction of animal numbers, and consequently the loss of manure. Hence the chance to maintain fertility and soil structure is lost (Bebbington, 1993). Consequently, land is degraded, prejudicing the livelihoods of future generations as well as the present.

In these instances, perhaps the most effective way of offsetting degradation is through increasing rural employment opportunities, taking pressure off land. This is what Leach and Mearns (1992) have called "substituting employment for the environment" (also

Lipton, 1991). The preference for rural employment is that it offers an income source, but allows continued residence in the countryside for land maintenance. It also avoids placing further stress on urban services. Finally, in many cases it responds to the preference of rural people to stay in their home regions.

There are therefore a number of synergies between on-farm and off-farm growth in rural areas.¹¹ The challenge for policy is not to direct that growth, but to find appropriate investments and policy contexts that:

1. enable investment in the rural economy
2. encourage retention and reinvestment of rural surplus in rural areas
3. widen the livelihood choices of the landed and landless poor
4. strengthen the assets on which poor peoples' livelihoods are based.

Conclusions: implications for policy

There seems to be some consensus that liberalisation and economic reform has tended to create a relatively more favourable environment for agricultural growth. However, by itself this policy context is not enough to ensure growth. These policies are even less able to ensure agricultural intensification among the poorest. In some cases this is because the very poor have insufficient resources and land to make intensification a feasible livelihood strategy; in other cases of those farmers who have sufficient land, this is because they lack information and critical inputs or market access to be able to take advantage of this new context. This implies that additional targeted investments and programmes are required to promote intensification to the benefit of the poor. It also implies that at present the economic environment is potentially more auspicious for such investments than ever before.

In designing these interventions it is very important that we differentiate between those people who have the potential to intensify their livelihood on the basis of small-farm development, and those for whom this is impossible because of lack of or insecure NR assets. A poverty alleviating intervention will therefore need to combine relatively orthodox research/extension strategies with less orthodox concerns.

Even World Bank reports end their studies of the contemporary context with an all too familiar long wish list of policies and programmes (eg Lele, 1989; Lele and Stone, 1989). However, as we think of those livelihoods that can be improved through direct NR use perhaps the three most critical interventions for the poor are:

1. to improve market access - studies consistently conclude that improving road infrastructure and increased competition within the marketing chain to prevent monopolies

¹¹ Chambers and Conway suggest that "[t]o optimise the synergy of recirculation is an issue which should perhaps be confronted as a more central concern ... [a] general hypothesis can be that recirculation through local purchases and provision of goods and services will be more livelihood intensive than their import from the outside." (Chambers and Conway, 1992:24).

is critical. Such infrastructure will not overcome the absolute disadvantage of remote location; it will reduce some of the disadvantage;

2. to strengthen poor peoples' assets - in several respects. (i) There is need to protect and/or strengthen their access to the inputs needed for production, particularly land, water and trees. However, regularisation of land title must be done carefully to avoid damaging systems that give different groups of the poor overlapping rights in a resource. Also, the contexts in which land redistribution is politically feasible are few. (ii) It is necessary to strengthen poor peoples' access to support services and information, through increasing their ability to make demands on services and organisations - this implies training, organisation and the identification of effective and representative intermediaries. (iii) To improve their market participation in a way that allows increased incomes (and saving) - this, the studies imply, can most effectively be done by promoting competition among traders, and in some cases through producers organisations (Bebbington et al, 1993; Healey, 1988) though experience in this is checkered;
3. to continue with a research/extension programme that develops, and fosters among farmers the movement and adaptation of knowledge of (above all) land-saving technological options that have a low (or no) import content, and are labour-absorbing rather than capital intensive (Lipton, 1991; de Janvry and Sadoulet, 1989). These interventions must be complemented by the removal of subsidies and price biases that favour labour displacing technology, and which improve the terms of trade for agriculture.

In essence, all these interventions aim to increase farmer choice: by enhancing options and assets. Indeed the lessons from cases of successful farmer led intensification is that farmers are able to intensify when they have options and the resources with which to intensify.

Some of these policies will also favour growth in non-farm employment (especially labour intensive technologies and the improvement of market links and competitiveness). However "farm-oriented" agricultural development should be oriented primarily towards those small farmers with sufficient resources to absorb the majority of family labour on the farm. These programmes need to be complemented with more specific "household-oriented" programmes to address specific concerns of those families who derive significant proportions of income from off-farm activity.¹² These programmes would be oriented to supporting these types of non-farm employment with the most progressive implications for income distribution. Ex ante it is difficult to say what these activities would be, but evidence suggests that food processing and NR product transformation in general have progressive impacts on income distribution, and are particularly oriented towards increasing women's income generating possibilities.¹³

There is also a case for rurally based public works programmes which would employ the rural landless in the construction of infrastructure needed to facilitate agricultural response to the new policy context.

¹² The terminology is from de Janvry and Sadoulet, 1989.

¹³ Although care must be taken to avoid endorsing stereotypes that already contribute to the marginalisation of women.

A final area of intervention is not directly within the ambit of NR policy but is closely related to the argument of this paper. This is the need to identify and support the kind of institutional structure and economic activity that favours the retention and reinvestment of surplus within an area. The importance of this is clear: agricultural support programmes are more likely to be successful if they occur in areas where entrepreneurs and farmers are not channelling profits to urban areas. The implication is that where possible agricultural programmes should be linked with specific initiatives to challenge urban biases and support institutions and individuals who will reinvest in the region.

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**INTENSIFICATION OR OVERSTOCKING IN PASTORAL AFRICA:
WHEN ARE THERE TOO MANY ANIMALS?**

by
Roy H Behnke, Jr.

Rural Resources Management Group
Rural Poverty and Resources Research Programme

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INTENSIFICATION OR OVERSTOCKING IN PASTORAL AFRICA: WHEN ARE THERE TOO MANY ANIMALS?

Roy H. Behnke, Jr.¹
Overseas Development Institute, London

"Overpopulation" may be defined rigorously as too many animals, but the rigor ends there.
Graeme Caughley

The control of overstocking has long been a paramount objective of rangeland management in Africa. Encouraging the shift from subsistence-oriented pastoral systems to commercial forms of livestock husbandry has long been seen as one means of achieving this objective, while simultaneously increasing livestock output. This paper will argue that the commercialization process does indeed exert a long-term downward pressure on African stocking densities, which will make many people happy. But the shift from subsistence to market-oriented forms of livestock husbandry also exerts downward pressure on total rangeland output and undermines the capacity of rangelands to directly support large human populations, a possibility which is not generally recognized nor likely to be warmly welcomed by either external observers or many producers. Since the number of animals per unit of land is de-intensified under commercialization, it would appear that range and livestock development is a process of trade-offs, and that destocking, intensification and commercialisation cannot be simply equated with each other.

The nature of this policy dilemma becomes clear when we examine the concept of overstocking. Intensification involves the use of additional inputs to produce additional outputs. Overstocking involves excessive amounts of one kind of input - livestock - and a loss of output. Intensification is good, overstocking is bad, and the difference should be plain. But it is not. Overstocking is not a single concept assessed by like-minded observers according to a standard set of generally accepted criteria; rather, it is a group of ideas clustered loosely around the notions of too many animals and too little grass. And because different versions of the overstocking concept possess a common name and exhibit a certain family resemblance, they are often confused with each other.

The clarification of this conceptual muddle is the focus of the opening sections of this paper, which begins with an examination of the effect on output of 'intensifying' a range production system by investing in more and more animals, while holding constant the supply of grazing land. The results of this process of intensification are expressed as a production function for livestock output at various stocking densities. Examination of this production function reveals the existence of at least six different density 'thresholds' beyond which a rangeland might be judged to contain too many animals, i.e., six operationally distinct definitions of overstocking.

¹ Research Fellow, Pastoral Development Network, Overseas Development Institute, London, U.K. The research reported here was conducted in collaboration with Carol Kerven, Research Associate, Overseas Development Institute, under a grant from ESCOR (Economic or Social Research for the Benefit of Developing Countries), Overseas Development Administration, U.K. The author is solely responsible for the views expressed here.

THE STATE OF TEXAS, COUNTY OF DALLAS, SS. I, the undersigned, a Notary Public in and for the State of Texas, do hereby certify that the within and foregoing is a true and correct copy of the original as the same appears from the records of said County.

Notary Public in and for the State of Texas

My Commission Expires _____

Witness my hand and seal of office this _____ day of _____, 20____.

Notary Public in and for the State of Texas

Notary Public in and for the State of Texas

Notary Public in and for the State of Texas

Later sections of the paper compare the production functions for commercial beef ranching and African pastoralism and show that the boundary of what constitutes overstocking is likely to be very different in these two settings. Six stocking density thresholds are found in each of these forms of range livestock production, but comparable thresholds are positioned at higher stocking rates in pastoral than in commercial systems. This means that a stocking rate used by a commercial rancher to achieve a particular purpose would, almost certainly, be too low to achieve the same purpose for a subsistence-oriented pastoralist. At the very least, we must be prepared to revise our stocking rate guidelines as we shift our attention from commercial ranches to Africa's open ranges.

Aside from fostering lower stocking rates, commercialization also involves new forms of land tenure, qualitative and quantitative changes in the use of labour, increased levels of capital investment and greater use of purchased inputs, all in the interests of producing a diminished range and lower volume of output. For husbandry systems restricted to the use of natural forage, commercialization is not a generalised process of intensification, but rather of factor substitution and output specialization. The mundane problem of identifying appropriate stocking rates may, thereby, force us to reconsider what we are trying to achieve with livestock development in pastoral Africa.

Any discussion of how policy measures might influence pastoral stocking densities is premised on the assumption that the important causative factors are susceptible to manipulation. It has been argued recently that livestock numbers are controlled by drought-induced population crashes in Africa's low-rainfall, non-equilibrium rangelands (Ellis and Swift 1988, Westoby et al. 1989, Abel and Blakie 1989, Behnke and Scoones 1993). The options, or lack of options, for implementing resource management policies in these non-equilibrium grazing systems have been reviewed (Behnke 1994). But in Africa, equilibrium characteristics - stable primary production combined with density-dependent secondary production - predominate in rangeland areas where rainfall is relatively heavy and reliable (Ellis, Coughenour and Swift 1993). Generally speaking, these are also economically important pastoral areas supporting high numbers of people and livestock. Practical considerations therefore argue for continued attention to the development and management of relatively productive pastoral African environments in which the control of stocking rates is an important management concern. The closing sections of the paper examine the feasibility of employing a variety of policy measures - from tenure reform to pricing changes - which will influence pastoral stocking densities.

Biologically and Economically Optimal Stocking Rates for Beef Production

The economic and biological effects of stocking density are well understood in the case of commercial beef ranching, but are poorly documented for multi-species pastoral and agro-pastoral production systems. The following discussion begins with an examination of the criteria used to determine appropriate stocking rates on cattle ranches, and subsequently expands the analysis to account for the altered circumstances and objectives of African agro-pastoral producers.

The relationship between product output and cattle densities on a beef ranch is expressed diagrammatically in Figure 1, which summarizes the results of numerous grazing intensity experiments on a wide variety of different pasture types (Jones and Sandland 1974). In Figure 1 the vertical axis measures output in terms of weight gain (kg of beef produced) either per animal or per unit land area; the horizontal axis marks the stocking density in animals per hectare.

The first section of the paper discusses the importance of the research and the objectives of the study. It also provides a brief overview of the literature in this area. The second section describes the methodology used in the study, including the data sources and the statistical techniques employed. The third section presents the results of the study, and the fourth section discusses the implications of the findings. The paper concludes with a summary of the main points and some suggestions for future research.

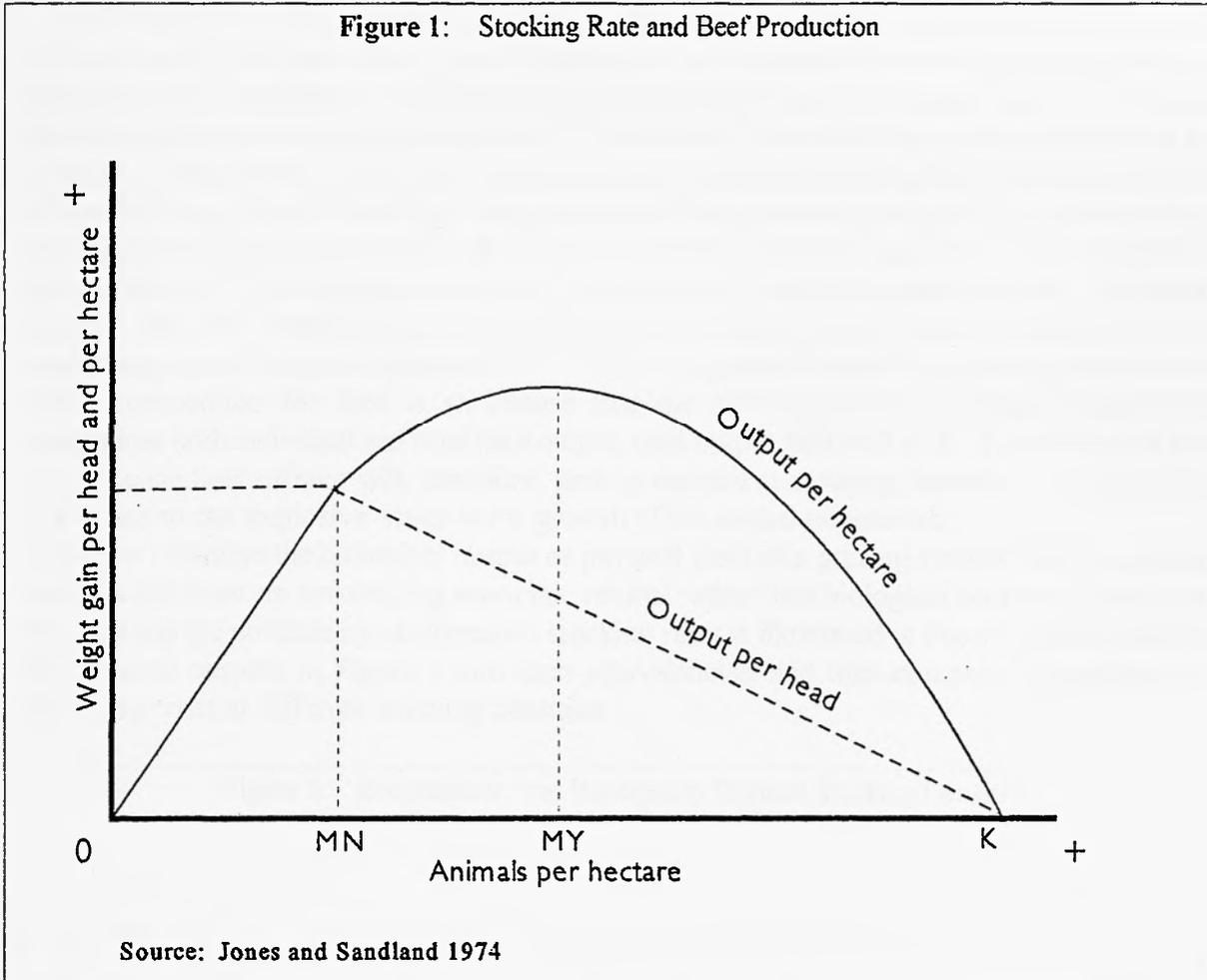
The methodology section details the data collection process, which involved a survey of a representative sample of the population. The data were analyzed using a series of statistical tests to determine the significance of the results. The results section shows that there is a strong positive correlation between the variables being studied, and this relationship is supported by the statistical evidence. The discussion section explores the reasons for these findings and their potential impact on the field of study.

The findings of this study have several important implications. First, they suggest that the relationship between the variables is not just a statistical artifact but a real-world phenomenon. This has important implications for policy-making and for the development of interventions. Second, the study highlights the need for further research in this area, particularly in terms of understanding the underlying mechanisms of the relationship. Finally, the study provides a model for how such research can be conducted, from the initial formulation of hypotheses to the final interpretation of results.

References

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Figure 1: Stocking Rate and Beef Production



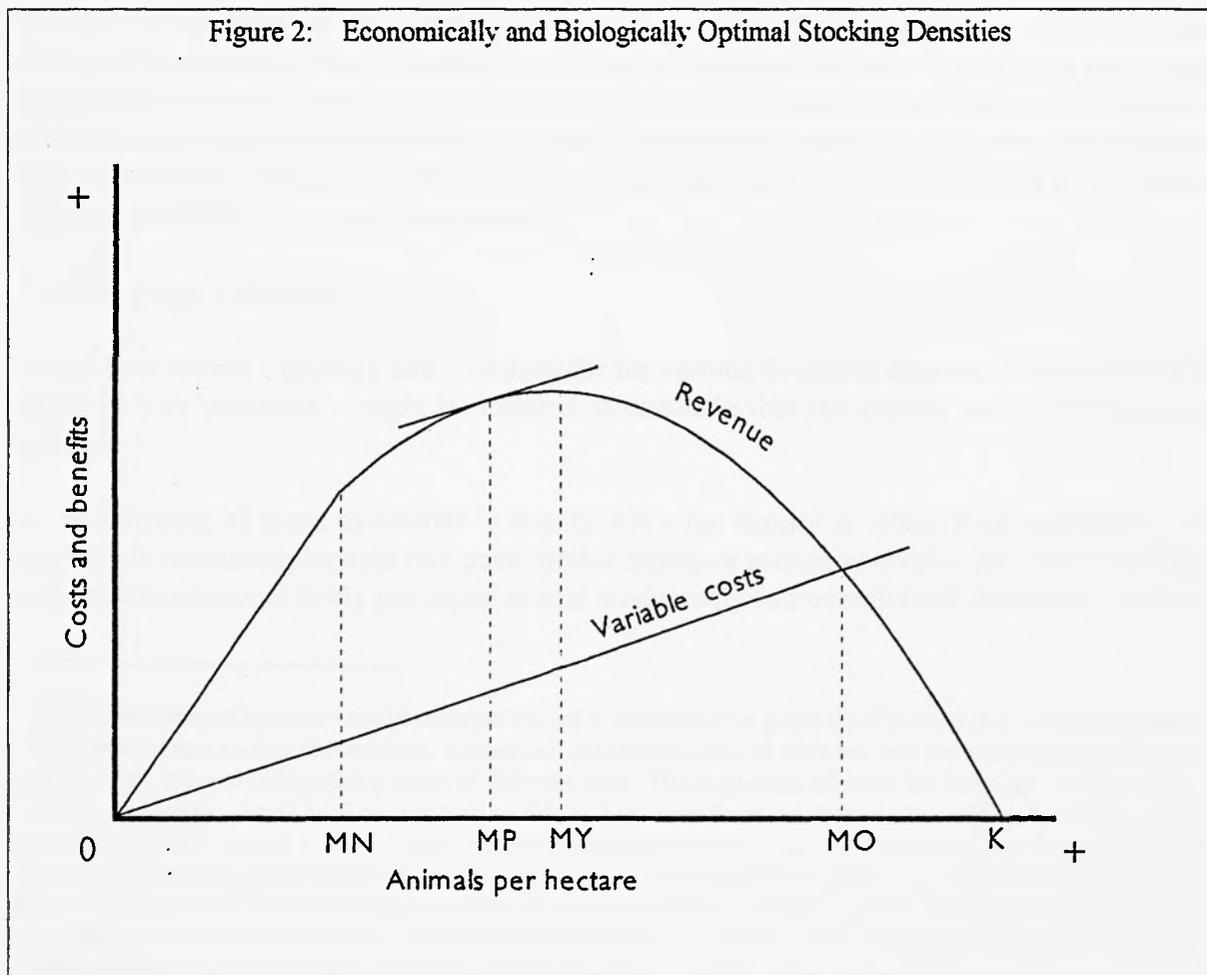
With respect to weight gain by commercial beef breeds, individual animal performance (dashed line) can be represented by a pair of straight lines. At very low stocking densities (from 0 to density MN), weight gain per animal remains constant because forage is so abundant that it constitutes no constraint, and diminished amounts of forage have no impact on animal performance. When forage does become a limiting factor at densities above MN , weight gain per animal decreases as an inverse linear function of stocking density (Jones and Sandland 1974; Hart 1978).

Beef production/weight gain per hectare (solid line) is a somewhat more complicated affair. The shape of this curve is a function of the per capita output of individual animals at different stocking densities, multiplied by the total number of animals at those densities. The result is a parabola which intersects the horizontal axis at two points (Figure 1). These intersections identify the only stocking densities at which the grazing system is at natural or 'unmanaged' equilibrium. At the zero intercept there are no animals, and so the system is stable, though unproductive. The other intercept, to the far right along the horizontal axis at K , marks saturation density or maximum sustainable herd size, also an unproductive but stable state. At this density, sometimes termed ecological carrying capacity, the animal population ceases to expand because it has grown so large that animals receive only a maintenance diet, and limited feed supplies produce death rates equal to birth rates.

At ecological carrying capacity an animal population produces no physical output in terms of average weight gain per beast or per unit land area. Most livestock owners and range managers therefore find it profitable to hold their livestock populations somewhere short of the ecological ceiling represented by saturation density. To artificially arrest herd growth and hold herd size short of K requires the constant culling of animals at a rate which will offset the natural capacity of the herd to grow. But culling - the harvesting of a steady crop of beef from the system - is precisely what the rancher wants to do. Situated half way between 0 and K - at the very peak of the parabola - is the stocking density MY at which the herd grows most quickly. Between 0 density and MY , adding more animals to the grazing system increases total output, but at a diminishing rate as densities approach MY . At densities greater than MY the reverse process takes over: competition for feed is so intense that the addition of more animals progressively undermines both individual and total herd output, until output falls to 0 at K . Ranchers who want to maximize beef offtake will, therefore, seek to operate at stocking densities in the vicinity of MY , close to the 'explosive' stage in the growth of the animal population.

Figure 1 displays the biological output or physical yield of a grazing system. But commercial ranchers are intent on maximizing economic returns rather than biological outputs. A technique for assessing the profitability of alternative stocking rates is illustrated in Figure 2 which converts the physical outputs in Figure 1 into cash equivalencies, and then compares these returns to operating costs at different stocking densities.

Figure 2: Economically and Biologically Optimal Stocking Densities



In Figure 2 the value of output and costs of production (vertical axis), are displayed relative to alternative stocking densities (arranged along the horizontal axis as in Figure 1). Output is expressed per unit area and, following Jarvis (1991), price per unit of output is arbitrarily set at one (1 \$ per pound, or 1 £ per kg, etc.) so that both physical yield and total revenue can be represented by the same curve.

Costs in Figure 2 refer only to variable costs which are incurred in the provision of those inputs which are required in different quantities for operation at different stocking densities, and therefore could be entirely avoided by ceasing production. These 'variable' costs - the expenses associated with purchasing additional equipment, veterinary supplies, hired labour, etc. - are, for purposes of illustrative simplicity, assumed to be constant per beast and, therefore, to increase linearly with the addition of each animal.²

The value of the rancher's own management input, family labour and land are treated as 'fixed' expenses since they do not increase with increases in animal numbers nor, at least in the short run, can they be avoided by ceasing operation. These fixed expenses are not treated as costs but do receive 'rent', defined as the difference between the total variable costs and gross returns to the enterprise. For the commercial rancher on private land, the economically optimal stocking density, *MP* ('maximum profit'), is that density which maximizes rent, the differential between total revenue and total variable costs. This point is reached at the level of production in which the last unit of output adds the same amount of revenue as costs. While more elaborate and precise techniques can be employed, the economically optimal stocking density in Figure 2 can be roughly identified by visual inspection; it occurs at the point of greatest vertical distance between the revenue and variable cost curves (see Booyesen, Tainton and Foran 1975; Carew 1976; Hildreth and Riewe 1968; Workman 1986, and Wilson and Macleod 1991 for discussions of the formal techniques involved in these calculations).

Overstocking Thresholds

Let us now review Figures 1 and 2 looking for the various threshold densities beyond which an observer - or producer - might be inclined to conclude that the system contained too many animals.

- i. The lowest of these thresholds is density *MN* - the density at which feed availability first becomes a constraint; beyond this point further increases in density entail a progressive decline in livestock nutritional levels, per capita animal productivity and overall herd condition. Because

²The assumption of constant variable costs per animal is convenient for purposes of general exposition, but unlikely to be warranted in particular field settings. Economies and diseconomies of scale are well documented in the literature dealing with the costs of operating herds of different sizes. The acquisition of water for livestock in Botswana is a convenient example. Small herd owners may be able to 'beg' water from their better-off neighbours and kin, and pay their watering debts through a diffuse system of non-commercial reciprocity. Larger herd owners may have to pay cash, or - as herd sizes grow - buy into the shared ownership of a water point, or invest in one or, finally, several private water points. These 'lumpy' investments/expenditures are difficult to phase in slowly, and are incurred as herds cross fairly clear size thresholds (Carl Bro 1982). Aggregate regional costs of operation - with respect, for example, to disease or predator control - are also unlikely to remain constant per head at different regional herd sizes.

of these detrimental effects, threshold MN has been widely employed as a baseline for determining appropriate intensities of rangeland use. Routinely, empirical evidence to establish the baseline in different grazing environments is provided by experimental results from agricultural research station trials conducted at, or close to, nutritionally optimal stocking densities. This research commonly documents a vast productivity gap between animals on research stations versus those in adjacent or similar pastoral areas. It is then concluded that the pastoral areas are overstocked, unproductive and poorly managed (Behnke 1985).

This species of 'yield gap' literature is premised, however, on a sleight of hand: production must be expressed per head, rather than per unit land area. As Figure 1 illustrates, stocking densities which sustain cattle at peak condition are unlikely to match the aggregate output of more heavily stocked areas, despite record levels of individual animal performance. In fact, few commercial ranchers could sustain the economic losses consequent upon employing such a low stocking rate. Specialized stud farms or breeding ranches producing very expensive animals valued for their pedigree rather than their carcass may be the only examples of commercial enterprises which can afford to maintain stocking densities which maximize individual animal performance. Since it would be unreasonable to transform Africa's open rangelands into a pan-continental stud farm, this initial definition of optimal stocking density is logically irrelevant to the problem at hand, although it has contributed significantly to a vague and ill-defined notion of 'overstocked' African rangelands.

ii. A second stocking threshold occurs in the vicinity of point MP in Figure 2. MP is the most advantageous stocking density for commercial ranchers who are trying to maximize their profits by maximizing the differential between the total variable costs and total value of their production. Assessed in terms of revenue generation, MP is, therefore, the optimal intensity of rangeland use. The self-interest of rangeland users will encourage the adoption of this stocking target whenever rangelands are monopolized by one firm or producer who is in a position to capture all the resource rents/profits generated by a restrained stocking policy.

The precise location of this commercial optimum is determined by a combination of biological and economic factors, and may be effected by changing cost levels or output prices, as will be discussed later in this article. Nonetheless, MP invariably lies to the right of (at a higher density than) MN ; so long as there are significant variable costs to ranch operation, MP will, with few exceptions, also be positioned to the left of (at a lower density than) MY , the next stocking threshold (Workman 1986).

iii. Our third threshold is defined strictly by biological criteria. Whereas density MN marked the point of maximum per capita animal output, MY ('maximum yield') marks the density at which a herd owner can obtain maximum aggregate output per unit area. For the rancher pursuing commercial objectives on freehold land, MY marks no management threshold. On the other hand, the maintenance of densities near MY may, under certain circumstances, be consistent with the objectives of subsistence-oriented African pastoralists. MY marks the stocking density which will maximize the combined output of all herds using an area and, thereby, provision the largest human population directly dependent upon the livestock of that area. MY would therefore conform to the political and strategic requirements of pastoral communities which were compelled to defend their resource base by maintaining on it the largest sustainable human population, a point to be discussed more fully later in this analysis. Stocking densities which maximize aggregate output

are, of course, significantly higher than those which are appropriate for either specialized breeders or beef ranchers operating in a commercial context and possessing secure title to their land.

iv. The next threshold density, at MO , maximizes the number of independent herding operations using an area. MO is not a desirable stocking target for any group of producers. Rather, it is the unintended result of a situation in which rangeland is unowned, access is completely uncontrolled and herders are free to enter and use a pasture at their own discretion. In this situation there is an incentive for new owners to add their private animals to those already using an area, in an effort to capture for themselves part of the unallocated economic rent which is available. The entrance of new herds and herd operators is likely to continue until aggregate stocking densities approach MO in Figure 2, the point at which total variable costs equal total economic yield.

At stocking densities beyond MO the costs of herd operation will exceed returns, rendering insolvent anyone who persistently operated at these densities. At MO all potential resource rents will have been dissipated by excessive numbers of livestock owners and livestock using the 'open access' resource, and herd operators will receive only an income sufficient to cover the costs of operation and to provide a minimum 'opportunity cost' wage comparable to what they could expect to earn if they abandoned pastoralism for some other occupation. MO or 'open access equilibrium' therefore represents the outer margin of viable economic operation on the rangeland in question. Stocking densities beyond MO may be biologically possible but they are not economically sustainable for any extended period of time. (For further discussion see Cheung's 1970 and Gordon's 1954 analysis of the relationship between fishing intensity and fish stocks, reapplied by Jarvis, 1991, to pastoral conditions).

v. The fifth stocking density threshold, K , marks the limits of what is biologically feasible over the long run in a particular grazing system. K is what wildlife biologists are referring to when they talk about 'carrying capacity' - the level at which a herbivore population would tend naturally to stabilize, assuming a relatively constant forage supply from year to year. Of purely theoretical interest for the owners of domesticated stock, K may for some wildlife managers represent a positive stocking goal - a wild herbivore population undisturbed by human predation.

vi. The highest conceivable levels of overstocking lie beyond K and, hence, are not depicted in Figures 1 and 2. These levels of overstocking - at what might be termed K^- - may be caused by an overabundance or a sudden dearth of vegetation and are, by definition, unsustainable in the long run.

Over-abundant feed supplies can result in the sudden expansion of animal numbers when, for example, new herbivore species are introduced into favourable habitats, temporarily releasing normal controls on population growth. This is the typical herbivore eruption. Animal populations overshoot available feed supplies because the herbivores consume the forage 'output' produced by the plants and then proceed to eat the vegetative 'capital' represented by the plants themselves, thereby undermining the basis for sustained levels of future primary production. When the lagged effects of this 'asset stripping' are felt, the herbivore population may crash. (For a definitive discussion of this phenomenon see Caughley 1976, 1979, 1981.) The eruption of domestic livestock populations is illustrated by the introduction of cattle, and the expansion and subsequent collapse of their numbers on the high plains of the western United States in the late 19th century (Osgood 1929) or, more recently, on the Mambila Plateau of Nigeria (Frantz 1980, Government

of Nigeria 1992). A population overshoot similar to that produced by an eruption can also be caused by a precipitous drop in primary production for whatever reason. In Africa, drought is the usual cause of these collapses in forage availability, and associated crashes in livestock numbers.

The biological asset stripping which underpins the herbivore eruption has its commercial parallels. Assuming that a rangeland cannot maintain ranching incomes at levels comparable to opportunities elsewhere in the economy, accelerated 'decapitalization' of vegetative stocks at K -animal densities is, at least in theory, a feasible commercial proposition.

To summarize the discussion thus far, there exist at least six distinct stocking density thresholds which can be defined in terms of livestock production criteria and beyond which a grazing system might be said to be 'overstocked'. Confusion arises because different densities may be appropriate to different management and production systems or advocated by different sets of professional observers. The thresholds are as follows:

- *MN*, 'maximum nutrition', the highest stocking density consistent with maintaining optimum standards of animal nutrition and individual animal performance;
- *MP*, 'maximum profits', the density which optimizes operator profits or 'economic rent' per unit land area, assuming rangeland is held in secure individual tenure;
- *MY*, 'maximum (biological) yield', the most advantageous stocking rate for pastoral communities which require the maintenance of high human population densities in order to defend land rights which are not legally secured;
- *MO*, the highest economically sustainable stocking rate, and the rate which, under conditions of open access equilibrium, produces the 'maximum (number of independent herding) operations';
- *K*, saturation density or ecological carrying capacity, the highest livestock populations which are biologically sustainable in a given setting;
- *K+*, a biological mining operation in which an unsustainably large livestock population temporarily maintains itself, before slipping or crashing back to a more modest size.

The initial lesson to be drawn from this analysis is that there is little point to simply characterizing an area as 'overstocked'. Rangelands are over or under stocked with reference to different - and potentially conflicting - sets of management objectives associated with alternative production systems and assessment criteria. The preceding discussion has identified six different sets of such criteria - animal nutrition, profits, yield, the number of herding operations and, finally, the total number of livestock which could be supported on a permanent or temporary basis - all of which might be maximized under different management regimes. The practical lesson to be drawn from this analysis is that:

[Overpopulation] is not a single neat phenomenon but a set of them. Before management activities can be planned to cope appropriately with a case of overpopulation, we must know

not so much why the area is overpopulated but rather in what sense it is overpopulated (Caughley 1981:1).

Optimum Stocking Rates for African Pastoral Production Systems

Despite scientific and policy concerns about pastoral overstocking, there exists little experimental data on mixed-product output from different combinations of indigenous African breeds and species at alternative stocking densities. It is, therefore, not possible to construct for multi-species multi-product husbandry systems an empirically validated density-dependent production function comparable to Figure 1 for beef ranching. Indeed, some observers argue that it would be prohibitively expensive to construct quantified production functions for husbandry systems as complex as those which prevail in arid and semi-arid Africa (Mentis 1977).

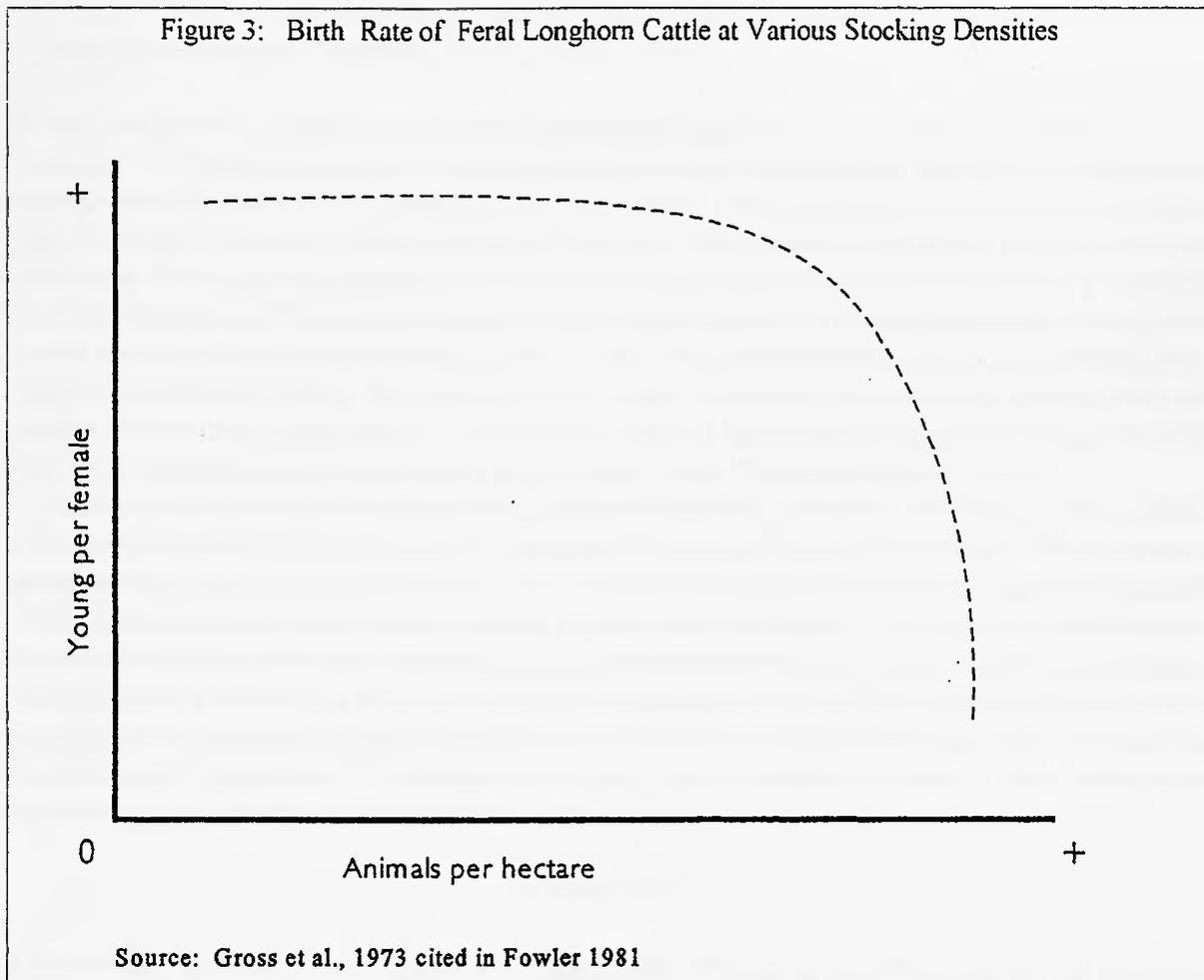
There exists, nonetheless, a body of experimental research on output from indigenous African stock subjected to various levels of nutritional stress. This material suggests that African livestock respond very differently than beef cattle to the nutritional deprivation associated with increasing stocking density. At least two sets of factors are responsible for these distinctive responses: the physiology of indigenous African livestock and the broad mix of products derived from pastoral and agro-pastoral herds.

Animal physiology

The 'improved' beef cattle kept by commercial ranchers have been selectively bred to respond to increased levels of nutritional input. But in seeking positive responses to improved conditions, breeders have had to accept the reverse process as well - declines in productivity resulting from input withdrawal. The linear relationship between per capita weight gain and stocking rate (Figure 1) reflects this long-term breeding programme - each incremental increase/decrease in feed availability being matched by a corresponding increase/decrease in beef output, over the range of stocking densities which are commercially attractive for ranchers and, therefore, studied by researchers:

'Unimproved' cattle breeds, in common with most large mammals, appear to respond rather differently to the stress posed by high density and low feed availability (Fowler 1981). Figure 3 plots the birth rate of feral longhorn cattle (*Bos taurus*) at alternative densities (Gross, Roelle and Williams 1973 as reported in Fowler 1981). Expressed as a birth rate rather than per capita weight gain, Figure 3 suggests that longhorn cattle are remarkably insensitive to changes in feed supply, and that their output may remain stable over a wide range of stocking densities. Instead of the gradual decline/improvement in animal output at different nutritional levels which is characteristic of industrial breeds, longhorn fecundity is relatively constant until it collapses precipitously just short of maximum herd size at K .

Figure 3: Birth Rate of Feral Longhorn Cattle at Various Stocking Densities



African pastoral cattle (and other pastoral herd species) appear to respond to nutritional stress like longhorns rather than commercial beef breeds. The physiological mechanisms which sustain output under stress are complex and, while not reviewed in detail here, include:

- a capacity when the animal is water and/or feed-deprived to use feed more efficiently and to quickly reduce energy expenditure to a fasting metabolic rate which is a third of normal maintenance rates (Payne 1965, Finch and King 1979, King 1983, Western and Finch 1986);
- a capacity for high rates of compensatory regrowth when forage is abundant, which offsets weight losses in periods of stress (Payne 1965; King 1983);
- the ability of calves to gain weight over the long term despite reduced levels of milk intake (Coppock 1989);
- the ability of cows to sustain milk output despite fluctuations in pasture conditions (Lampkin and Lampkin 1960).

- the ability to survive on a diet which is inadequate by standards of commercial breeds in temperate climates (Coppock, Swift and Ellis 1986).

In sum, indigenous African cattle breeds apparently retain some of the adaptive features of wild ungulates in which intra-specific natural selection favours individuals which are successful at coping with nutritional stress (Mentis 1977, Moss 1975). These adaptive characteristics contrast with the traits artificially selected by animal breeders. As a result, indigenous cattle are smaller and lighter than improved breeds, and can match neither the absolute level of output per animal nor the efficiency of the rate of feed conversion into livestock product achieved by improved breeds on enriched diets (Richardson 1994). What indigenous breeds do produce is the highest output per hectare or per kg of metabolic or body mass. And because indigenous breeds have low dietary maintenance requirements, output per hectare is maximized at higher stocking densities than with the larger, improved breeds (Richardson 1994; Tawonezvi et al. 1988).

Although cattle have received the bulk of research attention, it would appear that African small ruminants, and more especially camels (Gauthier-Pilters and Dagg 1981; Wilson 1984), respond to nutritional deprivation like African bovines. This would mean that the logistic growth equation of theoretical biology which was validated by Jones and Sandland (1974) for commercial cattle breeds, and is now generally accepted among livestock researchers, does not apply to indigenous African stock. Premised on a non-linear per capita response curve and with MY situated at values close to K , the speculative population models developed by Mott (1960) may fail to capture the density:output responses of commercial breeds, their intended referent, while adequately representing the behaviour of indigenous African livestock.

Product mix

The relative advantages of different stocking densities are also influenced by the kinds of products managers are seeking. There are several reasons for supposing that the density-dependent production functions for dairy produce, animal fibre, fertilizer products and drought power - all important pastoral and agro-pastoral products - are significantly different than the output curves for beef.

With respect to dairy production, Western has calculated that pastoralists can obtain over 2.5 times more energy from combined meat and milk offtake than from meat offtake alone (Western 1982, Western and Finch 1986). The higher offtake levels attainable from dairy production are the result of the greater efficiency of conversion of both feed energy (Blaxter 1962; King 1983) and feed nutrients (principally nitrogen, Spedding 1971) from pasture into human food, and reflect the different tropic levels at which milk and meat capture animal energy for human food.

Milk, fertilizer, power and fibre also differ from meat, hides and carcass derivatives in that the former are live-animal while the later are terminal products which require animal slaughter in order to be harvested. Optimum animal densities for carcass production are those densities which generate the greatest number of 'superfluous' animals for culling. As discussed previously, these densities occur at the 'explosive' stage of herd growth, at about half of K for beef cattle (Figure 1). On the other hand, densities appropriate to live-animal production are those which sustain an appropriate 'standing crop' of animals rather than a rapid turn-over in the animal population. Even in commercial production systems, the stocking densities which produce maximum milk yield or wool production per unit land area are higher than those which sustain maximum meat output for

identical breeds or species (Payne 1990, Donnelly, McKinney and Morley 1983, 1985). To take the limiting case, manure - an important product in some agro-pastoral systems - is almost certainly produced in the greatest quantities by animal populations much closer to K than to half K .

The combined production effects of indigenous breed characteristics and agro/pastoral output mixes are depicted in Figure 4, which compares the physical output of ranch and pastoral stock at different densities. The salient differences between commercial and pastoral productivity at alternative stocking densities are as follows:

- At low stocking densities pastoral output is probably lower than ranch output, reflecting the capacity of improved breeds to outperform indigenous breeds under favourable nutritional conditions;
- In pastoral systems both maximum yield (MY) and maximum herd size (K) occur at higher stocking densities than would be feasible under ranch conditions, reflecting both the importance of live-animal produce and the capacity of pastoral stock to withstand nutritional stress;
- In pastoral systems, herd output falls precipitously from the point of maximum yield to zero yield at ecological carrying capacity, reflecting a non-linear relationship between stocking density and per capita fecundity and output;
- Maximum output from the pastoral system is higher than ranch productivity, as a result of the combined effects of a broader product mix, pastoral emphasis on live-animal output, and the greater physiological resilience of native breeds - all of which are compatible with the profitable maintenance of higher stocking densities.

Extensive Ranching and Intensive Pastoralism

Table 1 summarizes available empirical evidence on the relative productivity of commercial ranching and open-range pastoral production. Table 1 is certainly incomplete in that it does not include comparative studies which were unobtainable or unknown to the author. With this proviso, the table is not a selection of the available evidence. It is all the evidence from comparative studies of ranching and pastoralism which meet two criteria. First, all the studies cited here attempt to capture in one unit of measure - be it protein, calories of energy, or cash values - the combined utility of the diverse array of products generated by indigenous herds. Second, all these studies express output on a per hectare basis, which makes possible a direct comparison of rangeland productivity under alternative production systems.

The methodological problems involved in comparing fundamentally different production systems are immense, as are the problems of accurately assessing the combined value of products as diverse as milk, meat, fibre, power and fertilizer. The safest interpretation of the values in Table 1 is that they are reasonable though rough approximations of the relative output of commercial ranching and pastoralism. The results are nonetheless compelling. The case material comes from West, East and Southern Africa, so the geographical spread of the evidence is quite good. And across Africa it would appear that indigenous open-range pastoral systems achieve,

at the very least, output parity with ranching systems in comparable natural environments; routinely the indigenous systems exceed by a wide margin the yield from comparable commercial systems.

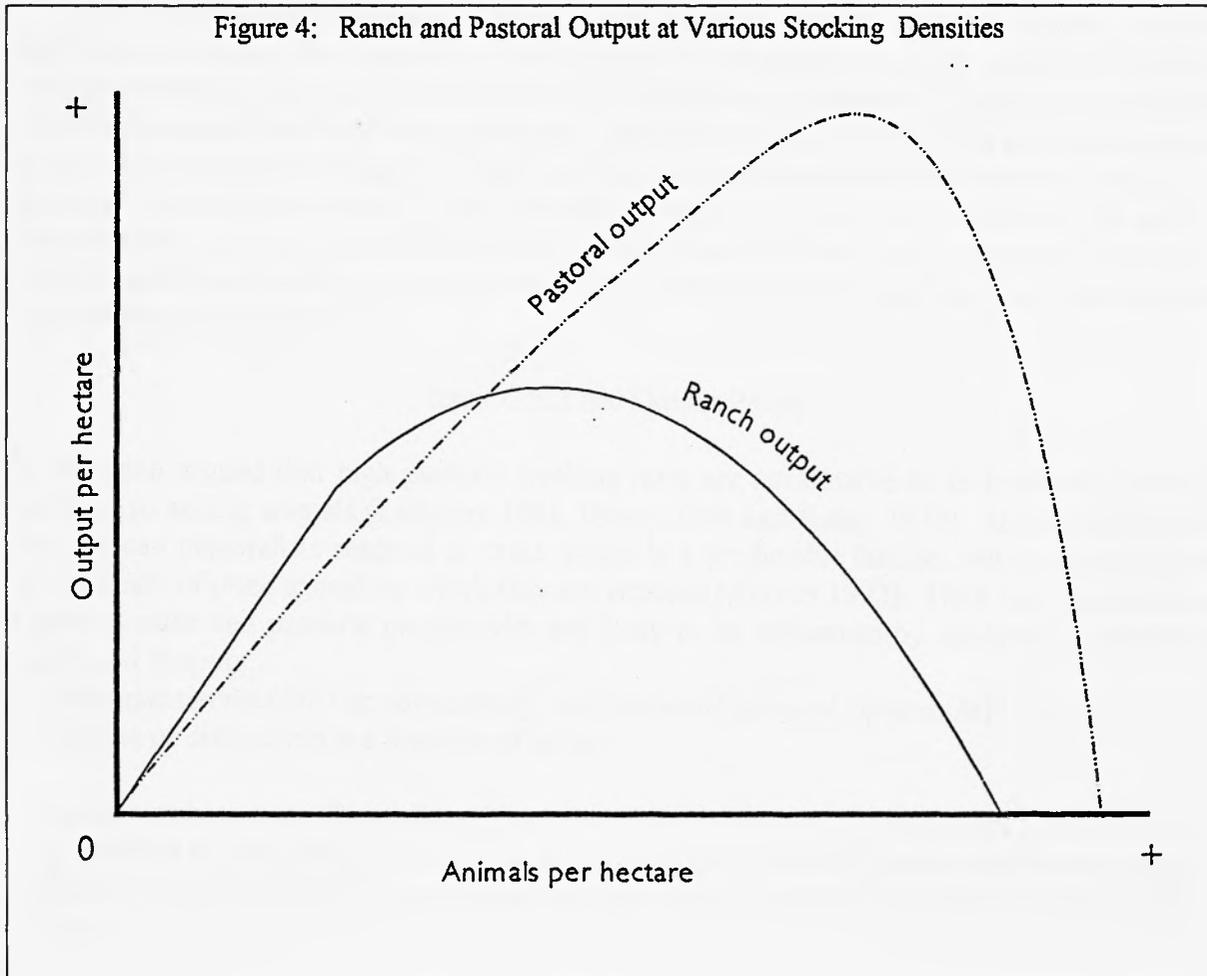
Table 1: Comparative Productivity of Commercial Ranching and Open-Range Pastoral Production under Comparable Ecological Conditions

Country	Productivity of pastoralism and ranching (ranching = 100%)	Units of measure
Mali	80-1066% (relative to US ranches)	kg. protein production/ha/year
	100-800% (relative to Australian ranches)	kg. protein production/ha/year
Ethiopia (Boran)	157% (relative to Kenyan ranches)	Megajoules/ha/year (megajoules of gross energy edible to humans)
Kenya (Maasai)	185% (relative to East African ranches)	kg. protein production/ha/year
Botswana	188% (relative to Botswana ranches)	kg. protein production/ha/year
Zimbabwe	150% (relative to Zimbabwe ranches)	Zimbabwe \$/ha/year

Sources:

Mali	Penning de Vries, F.W.T and Djiteye, M.A. (1982) <i>The Productivity of Sahelian Rangelands: A Study of Soils, Vegetation and Land Use in the Region</i> . PUDOC, Wageningen, The Netherlands.
Ethiopia	Cossins, W.J. (1985) The Productivity of Pastoral Systems. <i>ILCA Bulletin</i> 21:10-15.
Kenya	Western, D. (1982) The Environment and Ecology of Pastoralists in Arid Savannas. <i>Development and Change</i> 13:183-211.
Botswana	de Ridder, N. and Wagenaar, K.T. (1984) A Comparison between the Productivity of Traditional Livestock Systems and Ranching in Eastern Botswana. <i>ILCA Newsletter</i> 3(3): 5-6.
Zimbabwe	Barrett, J.C. (1992) The Economic Role of Cattle in Communal Farming Systems in Zimbabwe. <i>Pastoral Development Network Paper</i> 32c.

Though circumstantial, the evidence summarized in Table 1 supports the hypotheses graphically represented in Figure 4: the shift from subsistence-oriented pastoralism to market-oriented ranching may be appropriately characterized as a process of specialization and commercialization, but it is **not** a process of intensification. To the contrary, as compared with subsistence-oriented pastoralism, commercial ranching is relatively extensive in the utilization of land, although other production factors are intensified - inputs of labour per head of livestock decline, for example (Sandford 1983, Ruthenberg 1980, Sikana and Kerven 1991). What is of interest to this analysis is the relationship between land, livestock numbers and livestock output. Table 1 suggests that output from the land falls in the transition to commercial production, as does the intensity with which livestock are utilized per hectare (i.e. the stocking rate). This conclusion suggests that the conversion of indigenous African livestock husbandry to market-oriented meat production will, if successful, depress stocking rates in the long run. This conversion will, however, entail real costs in terms of declining total livestock output per unit land area.



In sum, destocking programmes do not necessarily present the unqualified benefits - more grass, more output and more profit - envisaged by their enthusiastic proponents. Referring back to the earlier discussion of overstocking thresholds, it all depends on the animal densities prevailing when destocking begins and ends, and on what the manager wants from the system. A healthy scepticism regarding the virtues of destocking in particular circumstances is, therefore, fully justified.

And there are yet other complicating factors. Assuming that destocking is advisable, it is by no means clear that this objective is reliably and affordably achievable for African rangeland administrators. The closing sections of the discussion examine these questions of method, practicality and reliability.

Policies to Control Pastoral Stocking Rates

Provided the important causative factors are susceptible to manipulation and the advantages of manipulation outweigh the costs, policy measures to reduce pastoral stocking rates are the obverse of the conditions which promote high densities.

The preceding analysis reviewed the reasons for heavy stocking in pastoral areas. In this section we examine the mechanisms which might be employed by policy makers to depress pastoral stocking rates, and the feasibility of deploying these techniques. The discussion begins with an examination of palliative measures - the manipulation of production costs and output prices - which promise immediate results without necessarily requiring fundamental changes in pastoral production systems. The discussion concludes with an examination of policy interventions - such as land tenure reform - which would require major alterations in pastoral society, and therefore have a long-term impact on the intensity of rangeland use, but probably offer no immediate relief.

Input Costs and Output Prices

It has been argued that high pastoral stocking rates are attributable to an irrational pastoral aversion to selling animals (Lamprey 1983, Doran, Low and Kemp 1979). It is also possible that African pastoralists respond to price stimuli in a predictable fashion, but are constrained by the kinds of price stimuli to which they are exposed (Kerven 1992). Here we examine how stocking rates and pastoral productivity are likely to be influenced by changes in prices for inputs and outputs.

Economic optima (*MP*) do not routinely coincide with biological optima (*MY*) (Figure 2), and the degree of disjunction is a function of prices:

As the purchase costs of animals and the costs of development and management per animal rise in relation to the other costs so will the economically optimal stocking rate be depressed further and further below the stocking rate maximising secondary production (Mentis 1977: 94).

In the vocabulary employed here, as variable costs increase, the stocking density which maximizes net revenue will decrease, all else being equal. This relationship is conveyed in Figure 5, where the revenue from a grazing system is held constant at two different levels of variable costs,

denoted *costs* and *costs**. With increasing variable expenses (from *costs* to *costs**), there is a decline in both the stocking density which produces the highest net profit (from density *MP* to *MP**) and the density at which open access equilibrium occurs (from *MO* to *MO**).

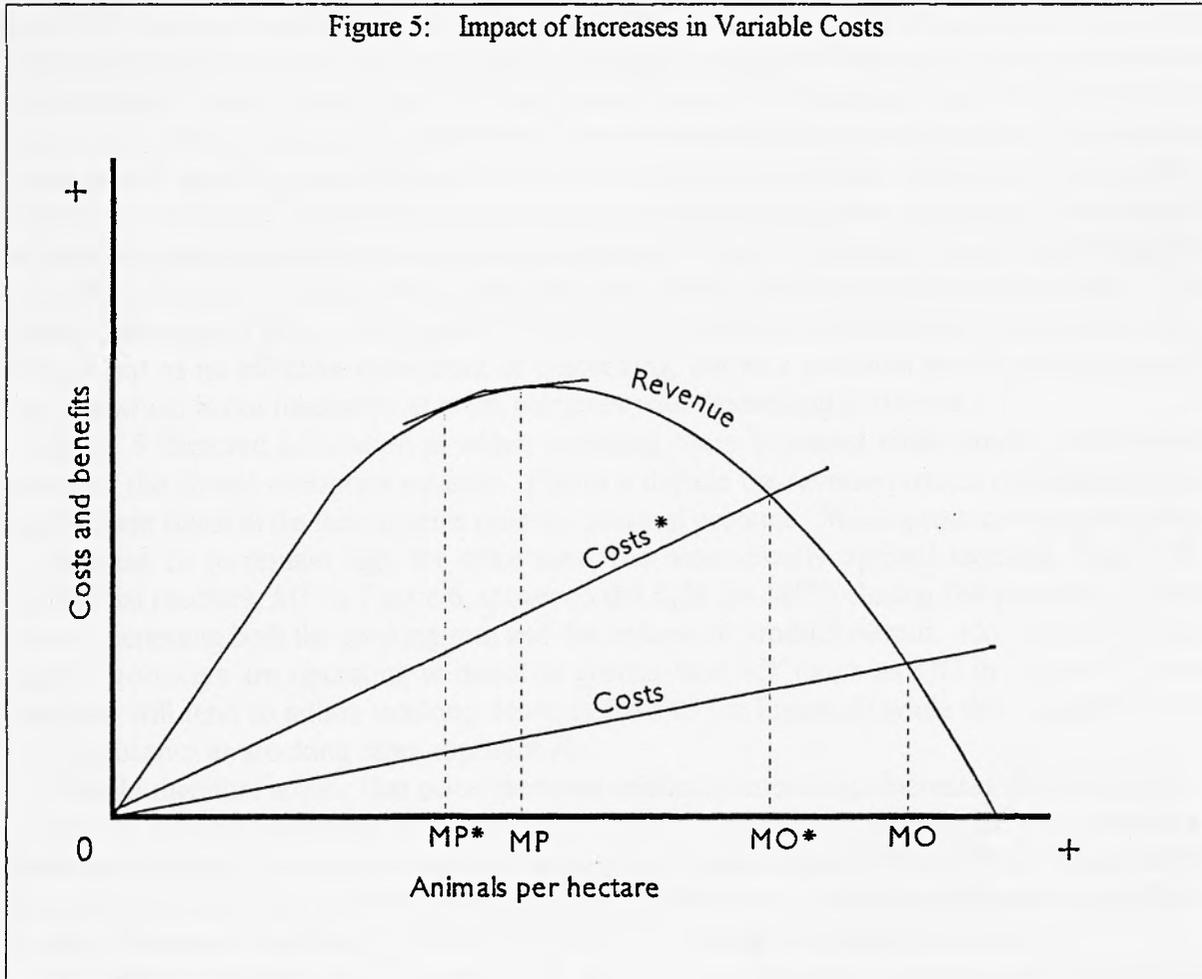


Figure 5 suggests a number of possible policy interventions. One obvious observation is that the provision of subsidized or free inputs for pastoral producers - feed or mineral supplements, water development or veterinary support - will tend to reduce variable costs and thereby encourage high stocking rates. Programmes of subsidized input supply therefore appear to be inconsistent with a commitment to a policy of controlling the growth of livestock numbers. However, a counter argument in favour of subsidies can be based on the observation that the cash costs of herd operation are extremely low for subsistence-oriented pastoralists, and that temporary subsidies may encourage the adoption of husbandry techniques dependent on purchased inputs, commercial sales and the lower stocking rates associated with market-oriented production systems. Immediate subsidy-induced increases in stocking rates could, according to this argument, be more than offset by declining stocking densities associated with long-term changes in production systems.

Taxation can also be used to increase variable costs. A grazing tax levied on each animal

Taxation can also be used to increase variable costs. A grazing tax levied on each animal retained on the range - essentially the Jangali tax of colonial Nigeria - would inflate operating costs and depress optimal stocking densities (Stryker 1984). As Jarvis (1991) has argued, however, taxation measures which were draconian enough to have a significant impact on livestock numbers would likely prove unworkable in practice. Destocking enforced through taxation would force poorer producers off the ranges even as production was rising, while those who remained would be no better off than before, since all increases in productivity would be passed on to the government. In practice the situation would also be complicated by fluctuations in rangeland carrying capacity associated with variations in rainfall, suggesting the need for variable grazing fees. Even if they were accurate and timely, adjustments in taxation levels would be politically unacceptable since they would inflate tax levies to reduce herd sizes during periods of insufficient rainfall, precisely those times when pastoralists are already suffering hardship. (For a fuller discussion of these points see Jarvis 1991). A livestock head tax may, therefore, be best viewed not as an effective instrument of destocking, but as a potential source of government revenue which is not inherently at cross purposes with destocking initiatives.

Figure 5 depicted a situation in which operating costs increased while product prices held constant, the classic cost/price squeeze. Figure 6 depicts the reverse process in which variable costs remain stable in the face of price rises for pastoral produce. When producers expect prices to increase or to remain high for some time, the economically optimal stocking density for commercial ranchers, MP in Figure 6, moves to the right (to MP^*) closing the gap with MY and thereby increasing both the stocking rate and the volume of product output. However, if for any reason producers are operating at densities greater than MY (such as MO in Figure 6), price increases will tend to inflate stocking densities (to MO^* in Figure 6) while depressing levels of physical output as stocking rates approach K .

It would therefore appear that price increases uniformly encourage increases in stocking rate. Moreover, if prices improve in a situation in which rangeland is already heavily stocked at densities above MY , it would also appear that rising prices have the perverse effect of depressing livestock product output. On this reasoning, price increases are uniformly detrimental to efforts to control livestock numbers, at least in the short run among commercial ranchers.

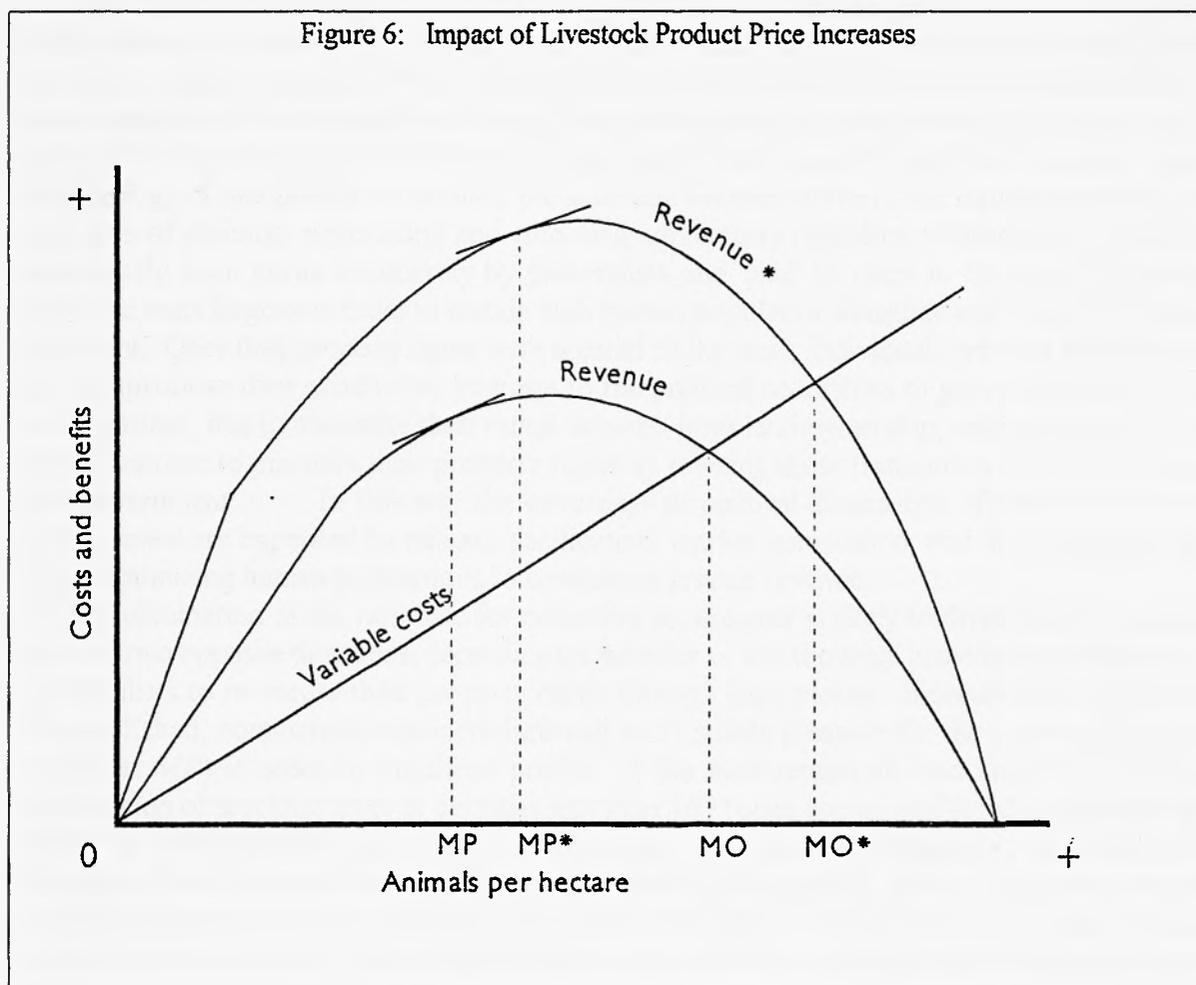
The situation may be more complex on Africa's open ranges where producers tend to be involved in production both for the market and for home consumption. Intensification, Gass and Sumberg have observed, can proceed in two distinct ways:

through the progressive modification of existing production systems, or the establishment of entirely new systems. The former represents a positive movement along the production function or an outward movement of the production function itself; the latter, a move to a new production function (1993: 27).

Figure 6 may accurately depict the immediate response of African agro-pastoralists to increasingly attractive marketing opportunities - a readjustment of their position in terms of their existing production function and existing production system, i.e., an increase in stocking rate. As illustrated in Figure 4, however, these producers do not possess an indigenous production system equipped to maximize commercial meat output. For this they require new livestock breeds/species, reductions in live-animal product output, commercial inputs such as veterinary supplies, and, most importantly, improved forage supplies commensurate with the greater

nutritional demands of commercial breeds.

In short, these emergent commercial producers may be tempted not simply to tinker with their old husbandry system but, eventually, to shift to a system of production specifically tailored to commercial output. If the reasoning summarized in Figure 4 is accurate, this shift will require a considerable reduction in stocking rate, of a magnitude to dwarf the effects of the other policy measures examined thus far. It would therefore appear that the real opportunities to reduce African stocking rates do not lie in attempting to manipulate existing production systems, but in the commercial evolution of these systems over time.



The relationship between land tenure and stocking rate

The influence of land tenure on stocking rates, forage availability and the evolution of commercial livestock production has been debated for decades. Figure 2 suggests part of the reason for this fascination, for it identifies two very different stocking densities associated with radically different types of resource control: private rangeland tenure (at density MP) and open access equilibrium (at density MO).

Essential to the survival of these communities was the capacity to sustain their position in the face of challenges from similarly constituted rival political and territorial groups. The individual proprietary rights of group members were conditional upon the successful prior maintenance of the sovereignty of the group to which they belonged. Under these conditions, the social optimum or optimum stocking density was not identical to the monopoly maximization of revenue at MP (Gordon 1954: 129), as it would be for industrial ranchers, but with the maximization of the number of pastoralists. Politically autonomous subsistence-oriented pastoral communities pursued demographic rather than economic optima. Assuming that these human populations were provisioned by the rangeland resources under their control, density MY maximized physical output and marked the optimum stocking density.

This is common property resource management of a kind indigenous to African pastoral communities, and provides the starting point for any discussion of the impact on stocking density of tenure change (Behnke 1994). Military pacification and the imposition of central state rule have destabilized these collective forms of pastoral tenure by relieving individuals of the need to secure their proprietary entitlements through membership in viable territorial groups. In the terminology of marginalist economics, the state has assumed some of the transaction costs - the burdens of defining, negotiating and enforcing agreements regarding transactions - which had previously been borne exclusively by pastoralists and 'paid' by them in the form of potential resource rents forgone in order to sustain high human population densities and a credible military deterrent. Once their property rights were secured by the state, individuals were no longer forced to compromise their productive interests to the political necessities of group solidarity. They were, instead, free to maximize their rental incomes from land ownership, setting aside a portion of this income to maintain their property rights by meeting those transaction costs not borne by the government. In this way the 'sovereign' or political dimensions of collective resource management are imperiled by military pacification, market penetration, and the consequent shift from optimizing human populations to optimizing private revenue.

The elimination of the rationale for collective sovereignty is likely to drive pastoral stocking rates in two opposite directions, depending on whether or not the state provides a mechanism for pastoralists to re-secure their property rights through legal means. If tenure rights are legally reestablished, commercial considerations will exert steady pressure for the control of stocking rates (at MP) in order to maximize profits. If the state retains all resource rights for itself, stabilization of stocking rates at densities less than MO (open access equilibrium) depends upon effective administrative regulation of the intensity of resource exploitation. Recent history suggests that state regulation of this kind is unlikely to succeed; indeed, tax revenues from rangeland areas may be so small as to render such administration uneconomic and, hence, doomed to failure in the long run. Much therefore hinges upon the state relinquishing its rights of eminent domain to rangeland resources, and re-securing the tenure rights of pastoralists and pastoral communities.

Traditional policy debates on pastoral tenure have centred on the issue of whether governments should use their legal and administrative authority to promote communal or individual rangeland tenure. Many economists argue that communal restrictions of stocking rates are inherently unstable because of the incentive structure of collective tenure, in which self-interested individuals are encouraged to ride-free and overstock at public expense. There is, however, no reason in principle to assume that collective property management will restrict livestock numbers any less effectively than individual tenure (Bromley 1989; Runge 1981). 'Free-riding' is a way for people

to steal from each other in a property system in which part of the productive apparatus (livestock) is privately owned and part (grazing land) is collectively owned. 'Theft' is a way people steal from each other in an economic system dominated by exclusive property. Sophisticated debates as to whether free riding is an inevitable outcome of communal tenure are hardly pertinent. Without a restrictive property system theft would be both unimaginable and pointless, and yet we are not treated to marginalist economic analyses of the inexorable inefficiency of a private property system which 'encourages' theft, nor does the conceptual possibility of theft render exclusive property rights theoretically untenable. We simply create, or posit, a police force.³ Different property systems generate alternative illegal antitheses, and free-riding is simply the name we give to anti-social behaviour in a communal property setting. Uncontrolled anti-social behaviour can destroy any property regime. Is private property sustainable during a riot of looting? This question - and similar questions regarding the control of free-riding - cannot be answered on first principles. There would appear to be a point at which logical analysis must give way to careful experimentation and to the examination of individual cases, and when pragmatism may be more efficacious than ideological purity.

Conclusions

The preceding analysis has yielded a modest harvest of both positive policy recommendations and cautionary warnings.

1. Policies to combat the undifferentiated threat of 'overstocking' are both generally ineffectual and potentially damaging. We must first determine what kind of (alleged) overstocking we are dealing with, before examining the evidence for its existence and the costs and feasibility of its control.

Caution is warranted because destocking can be expensive for both managers and producers. At densities short of *MY* and *MP* (wherever these points may lie in a particular grazing system), destocking entails reductions in, respectively, rangeland output or pastoral revenue. Ranching standards of appropriate stocking rates, which have been meticulously researched, do not apply to the distinctive husbandry systems employed by African pastoralists and agro-pastoralists, which operate at higher *MY* and *MP* densities than those suited to commercial ranching. At present we probably have enough field data to hazard a reasonable approximation of *MY* and *MP* for, at best, a handful of well-studied African agro-pastoral systems (Bremen and de Ridder 1991). There is considerable scope here to continue making very expensive mistakes.

2. The administrative manipulation of stocking rates is possible through policies which alter input costs and output prices - through taxation, subsidy removal, infrastructural development, the opening of new markets, etc. At least in theory, the impact of price stimuli on stocking densities

³Under the headline 'Robber Detained' there appeared the following news item:

A man who escaped from [a] psychiatric hospital in Kent and carried out an armed bank robbery was ordered to be detained indefinitely in a high-security unit. [He] told police who arrested him that he could not see why he had done wrong because he had no money and the bank had plenty (The Independent Newspaper, London, 5 February, 1994).

should be predictable. In practice, complications arise because pastoralists can respond to price changes either by altering their stocking rate to reposition themselves along their existing output curve, or by shifting to an entirely new output curve associated with a different production system. These alternative responses may produce contradictory results. Output price increases and/or input cost decreases should, for example, encourage heavier stocking rates if producers respond by intensifying their existing production systems. On the other hand, destocking should result if favourable commercial conditions encourage a shift to a market-oriented but less intensive production system such as ranching. Producers may, of course, undertake both courses of action, but at different time scales.

Theoretical clarity may, in practice, give way to considerable empirical complexity. Careful field research will undoubtedly clarify the situation, but the diverse ways in which producers may respond to stimuli suggest that true, non-trivial generalizations may be difficult to discover (Kerven 1994), and that - for the foreseeable future - most recommendations will be site and situation specific.

3. Indigenous pastoral tenure systems encouraged high output levels coupled with relatively high stocking densities in the vicinity of *MY*. Market penetration and effective state administration will tend to push stocking densities either down towards commercial optima (at *MP*) or up towards open access equilibrium (at *MO*), depending on governmental policy on pastoral land tenure.

It can be confidently asserted that administrative recognition of legally secure land rights is a critical factor in controlling stocking rates. Much less clear are the relative advantages of individual or group tenure, a debate which may be impossible to settle by reference to first principles. Traditional pastoral tenure systems are constructed around variable degrees of exclusive versus open resource tenure, determined on a case by case basis according to natural, social and technical factors (Behnke 1985, 1994). Effective modern tenure formats are likely to be just as variable.

4. Points 2 and 3 (above) provide a weak foundation upon which to build policy, if policy is conceived of as a series of broad prescriptive generalizations validated by extensive research results. Our research results are certainly flawed and partial. But in addition to simply demanding 'more research', it might also be productive to re-examine our approach to policy formulation and management in cases, like the present one, where complexity and uncertainty are intrinsic to the task at hand. For such an exercise it may be useful to set temporarily aside the notion that African rangeland management is an analogue to the management of normal industrial production processes, such as the operation of a tuna canning factory, and instead view management as an 'adaptive, probing and deliberately experimental' process (Walters 1986: vii) which blurs the distinction between policy-driven intervention and policy-relevant research. Adequate discussion of this possibility lies outside the limits of the present discussion; it should be noted, however, that the preceding analysis of stocking policy conforms to what Walters has identified as the 'three essential ingredients' of adaptive management:

mathematical modelling to pinpoint uncertainties and generate alternative hypotheses, statistical analysis to determine how uncertainties are likely to propagate over time in relation to policy choices, and formal optimization combined with game playing to seek better probing choices (1986: vii-viii).

5. Ranching is more extensive than subsistence-oriented pastoralism, which employs more people, maintains heavier stocking densities and achieves higher levels of output per unit land area than commercial forms of range livestock production. For small-scale livestock keepers in relatively well-watered areas, intensification of their production system implies not the adoption of commercial ranching techniques, but the closer integration of crop farming and livestock husbandry. This evolutionary process, which is only indirectly illuminated by the present analysis of range livestock issues, is likely to have a profound impact on the appropriate design of livestock policies in what were once Africa's more humid grazing areas (Tiffen et al. 1994; McIntire et al. 1992).

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**DIVERSITY AND CHANGE IN LOCAL WATER MANAGEMENT
INSTITUTIONS**

by

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Rural Resources Management Group
Rural Poverty and Resources Research Programme

RPRRP

Working Paper No 7

January 1994

Funded by Natural Resources and Environment Department, ODA

DIVERSITY AND CHANGE IN LOCAL WATER MANAGEMENT INSTITUTIONS

Linden Vincent, Richard Friend and Christopher Southgate (eds)

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DIVERSITY AND CHANGE IN LOCAL WATER MANAGEMENT INSTITUTIONS

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Summary

The WRF Network undertook this study of local institutions as part of its widening interests in rural water management. The study had three main functions:

- to look at the forms of water management organisation, and the use of concepts of community and community organisation by the state in nation-building and development policy. The history of rural organisations - their strengths, weaknesses and external dependencies - has major implications for the performance of existing and new organisations under decentralisation policies. Despite the rhetoric on decentralisation and participation, it is unclear whether current trends represent moves to greater self-reliance or greater cooptation by the state. This lack of clarity has many implications for the dynamics of rural organisations;
- to look at the performance of a range of functions within local 'communities' and the extent to which 'multifunction organisations' (MFO's) have existed in rural settlements. State disengagement has renewed interest in local-level irrigation management, and the lessons from irrigation organisations have inspired interest in what further functions local organisations could undertake. Prospects to develop irrigation organisations into MFOs have received special interest in supporting irrigated agriculture under declining public sector funding. However, the traditional institutions nowadays advocated as the basis for collective action are often the most vulnerable in contemporary society. We were interested to study past experiences of change in organisations and management interactions across agriculture, natural resource management, local government and local politics;
- to develop a conceptual model of inter-relations between local water resource users and the state which could inform future work in the WRF and the RRMG collaborative programme.

These themes were studied through a general literature review, a mailshot to selected network members on MFO's and case studies of Thailand, Tanzania and Kenya. These case studies reflected expertise within the research team, a desire to compare different political contexts and a concern to strengthen understanding of African experiences that complemented the Asian experiences of other research fellows. It was not possible to find a researcher to provide a Latin American case study within the time and resources available.

Concepts of community and forms of community organisation

Concepts of community and forms of community organisation have been deeply influenced by authors trained in disciplines of public administration, and as such have often demonstrated a well-intentioned naivety about political dimensions of development. In irrigation, researchers have often overlooked the complexity of social organisation in rural society and focused on irrigation in isolation from other social activities and relations. This trend also links with

emergence of line ministries, and their complex interdependencies with local organisations using their services. While the development administration (and the state itself) often tries to portray the role of local organisation as managerial, this depoliticised view minimises the key issues of power, production and state/civil society relations.

The study explored the confusing vocabulary now in use for institutions and organisations. In water management research it is often unclear whether terms are used as general descriptors or whether they have particular legal meanings. This made it difficult to make any comparative review of organisations in relation to legal registration and functions performed. Organisations have been studied through their functions, their membership basis and use rights, their legal status and their political structure. However, authors have asserted common characteristics in long-enduring institutions regardless of their form and structure, as summarised on page 8. Different irrigation technology and catchment dependencies may require different organisational activities, but the way in which functions are organised is not easily predicted. Many locations show a range of organisation types, indicating the significance of cultural and political variables such as property rights and forms of association (associations, cooperatives etc) reviewed in the paper. Their dynamics of survival would differ under various policies of state disengagement.

Some additional recommendations from this study were to understand the nature of relationships between the organisation and the state, hence the classification of organisation types given on page 23. It is helpful to establish whether new formal entities had 'representative' and 'purposive' functions in liaising with state agencies and performing tasks, and how structures were determined by the desire of agencies to create organisations with which they can work easily, rather than local needs. Also to see whether these rights and responsibilities existed in reality as well as theory. It also helped to study the role the state continued to hold in operation of these representative and purposive functions, and how well they were performed. These hierarchical dependencies of water institutions, and the relative strength and weakness of different groups in a region, would have particular implications under conditions of state disengagement.

Equally important was to understand the rationale for group formation for water management. Some groups had been formed to receive and manage services delivered by the state, or to perform necessary functions dictated by the state in return for services. However, many indigenous water management groups had their base in collective action to get benefits from 'landesque' capital, operating for various objectives. The concept of 'hydraulic tenure' had played a major role in showing how water rights often related to both resources invested. Past government intervention often undermined the principles of hydraulic tenure and institutions based around it. Most of the work on hydraulic tenure and its links with institutions had taken place in groups where members have individual water shares, and this is often seen as the most 'efficient' base to water management arrangements. In fact, hydraulic tenure can also operate on behalf of a lineage or territorial group in order to sustain group welfare. In such situations there are group rights that coexist and often over-rule individual rights, especially in crises like drought. These situations are found more often in what are called 'clan-based' or 'territory-based' groups which retain a high level of customary practice, sometimes managed without special management entities for irrigation. However, government policies may allow/enforce the emergence of water user organisations to oversee these older institutions.

emergence of line ministries, and their complex interdependencies with local organisations using their services. While the development administration (and the state itself) often tries to portray the role of local organisation as managerial, this depoliticised view minimises the key issues of power, production and state/civil society relations.

The study explored the confusing vocabulary now in use for institutions and organisations. In water management research it is often unclear whether terms are used as general descriptors or whether they have particular legal meanings. This made it difficult to make any comparative review of organisations in relation to legal registration and functions performed. Organisations have been studied through their functions, their membership basis and use rights, their legal status and their political structure. However, authors have asserted common characteristics in long-enduring institutions regardless of their form and structure, as summarised on page 8. Different irrigation technology and catchment dependencies may require different organisational activities, but the way in which functions are organised is not easily predicted. Many locations show a range of organisation types, indicating the significance of cultural and political variables such as property rights and forms of association (associations, cooperatives etc) reviewed in the paper. Their dynamics of survival would differ under various policies of state disengagement.

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All the studies emphasised the role that external agents had played in shaping concepts of community. The case studies demonstrated the changing history of state penetration and its shaping of village life. Both Tanzania and Thailand have used community structures through explicit nation-building policies and highly ideological approaches to community action, although the political debate on this has been very weak among irrigation researchers. These sometimes provoked resistance and even violent reactions when systems of state intervention and patronage failed to meet local interests. Experience from these earlier historical periods has taught state elites the efficacy of more sophisticated cooptation of grassroots organisations, through the manipulation of concepts of participation and decentralisation.

The Thai study emphasised how village development represented a bureaucratization of social organisation. Many of the tensions in rural Thai society reflected the conflict between two antithetical modes of organisation, bureaucracy and community, the former belonging to the state and the latter to the people. One feature of this bureaucratization has been the emergence of a plethora of single purpose organisations for supplying agricultural inputs, which only briefly may have had synthesis into cooperatives integrating a range of supply needs. The listing given on page 41, of reasons for poor performance of Thai rural organisations and state bureaucracies helps demonstrate the range of problems to be overcome in Thailand if more responsibility is delegated to local groups for rural life in general and water management in particular.

Power in the Thai nation historically has been based in the urban centres, and the village is argued to have become the client of the city. The Thai administration maintains the clientist position of the village by steering any village level participation into a subordinate role, only allowing the village flexibility within the existing social and political framework.

Differing opinions on the scope of local needs in community action between the state, NGO's and local people have also made 'the village' (primarily an administrative concept) a contested space. Among Thai NGO's the concept of 'community culture' has become a dominant ideology. It uses notions of a 'return to the roots', community-based an alternative to current models of development. These conflicting interpretations of the direction of national and local development have become even more significant with the marginalisation of large sections of the rural population, and devastation of the natural resource base, as Thailand has pursued a largely export-oriented, urban-biased course of development. The cost of recent high rates of economic growth are argued to have been the destruction of the natural environment and of rural communities; the 'backbone' of Thailand. In searching for the 'true' Thai community NGOs are reinventing the past but are in danger of idealising a 'golden age' notion of the past that never existed. However, veneration of rural communities and indigenous knowledge creates an assertiveness and self-confidence in rural peoples' capacity to play a part in development and to challenge established interpretations of national and local development.

The chequered experiences of irrigation organisations and water resource management organisations reflect these problems. It is the lost opportunity from older poorly structured state penetration into water management that may restrict future local-state relations. Past policies both failed to ensure a good dialogue between state and village, and helped create the agrarian differentiation which now makes local management more difficult. There is a tradition of some enduring and effective irrigation organisations, which have emerged as a

result of land colonisation and development. However, kinship has given way to property relations and often the emergence of 'membership' organisations based on water shares available to founding households, differentiating members from users. Older indigenous organisations had capacities to manage local infrastructure and environment, and collaborate over catchment water allocations. They have, however, sometimes been dislocated by irrigation interventions that changed technologies, and through it, water rights (often substituting volumes for shares). Their institutional dynamic has also been affected by specific registration requirements and broader changes in local government. Competition over land and water resources has proved particularly severe in the highlands. Very little is known about the water management institutions and shifts into wet-rice production among the Hmong and Karen tribes as land pressure reduces prospects for swidden gardening. More understanding of this would complement concerns and interests in forestry in Thailand.

The durability of some irrigation organisations is presented as testimony to the willingness of rural Thai people to act collectively for a specific function that is perceived to be of local importance. This is in contrast to state and some NGO attempts to organise people according to role (eg. the Housewives Groups, Young Farmers Groups). The performance of rituals to honour the spirits of the weir have been reinvented to honour the previous generations of irrigation representatives. However, this ritual may not simply be a means for reinforcing hydraulic property rights established by community ancestors, but a means of legitimising the power relations that the contemporary leadership has established within the broader sphere of state intervention.

In Thailand, the prospects for MFOs seem weak at village level. It does seem that private organisations have made important contributions to providing better services to local people, especially in the more accessible and urbanised regions. However, the uncertainty of survival of particular village-level organisations under decreased public sector spending raises questions about future service delivery. The relative urbanisation or peripherality of locations may have particular implications for quality of service provision. Where groups have become used to the 'clientist' approach of state agencies, changes in approach may bring unpredictable consequences for different groups, and variable responses to new initiatives. The future of integrated agricultural and natural resource management is also uncertain. While groups do seem to manage resources effectively within the space defined by farming activities, extensive immigration has threatened a number of pre-existing tribal arrangements. Catchment level management of land and water use seems set to remain controversial, with or without a bureaucracy. The contest for the village between state, NGO's and local people, and their very different policies, makes the emergences of future strategies in service provision and resource management difficult to predict.

The Tanzania case study allows a more explicit study of the history of state experimentation with community concepts and local government. The very different, and less dominant role of sectoral bureaucracies in irrigation, gives a different picture of dynamism and change in indigenous water management organisations. Tanzanian policies also promoted 'community' values different from Thailand as a basis to community development policies, notably self-sufficiency, popular participation and wide-ranging communal activity.

Older research studies suggest the existence of clan-based institutional arrangements, with many functions filled by elders of the community rather than existence of specific irrigation

entities, as in Thailand. However, management practices and management challenges have changed as a result of agricultural and settlement policies and changing livelihoods. While a number of tribes have practised mixed farming with irrigation as only part of the livelihood strategy, declining prospects for rangeland use, climatic fluctuations and changing markets and food needs have changed and often increased interest in irrigation.

The effects of 'Ujamaa' resettlement policies had many implications for water management, Ujamaa led to creation of registered villages where investments and services were concentrated, and gave village committees a mandate to manage local furrows. Responses from the different ethnic groups was highly variable, reflecting existing patterns of settlement and local institutions. These ranged from broad synthesis between village and irrigation committees in the Chagga systems of Kilimanjaro, to continued separate clan-based management by the Sonjo tribe. An intermediate system was the creation of a water user association, keeping management separate from the village administration. These different responses possibly reflect opportunities offered by legislation that gave tribal law formal status, and the ongoing ritual significance of the elder in the agriculture of tribes like the Sonjo. Villagisation led to population concentration and settlement growth with varied impacts on furrow management. Some furrows experience partition under new administrative boundaries, and population growth where demand exceeds supply. Other furrows could provide irrigated holding to virtually all local people, including new immigrants. Under Ujamaa, pressure on land, coupled with climatic fluctuation, have brought catchment-wide problems of degradation. These have proved hard for local groups to manage, even across village territory, as they lie outside a specific responsibility group and technologies appropriate to existing social conditions are not known to local institutions. This indicates a very different kind of watershed management challenge to those present in different parts of Thailand.

Tanzania had a history of experimentation with cooperative ventures, with some notable successes in marketing and supply cooperatives in the 1960's and 1970's. These built up their own membership with variable spatial coverage. However, formalisation of the cooperative structure proved disastrous, both through poor local performance and poor support from relevant parastatals. Both policy changes and local marketing activities has led to a return to earlier policies of optional participation in cooperatives which have a regional scope for particular commodities or particular groups of people.

Clearly, in Tanzania, the ability of existing institutions to interact successfully with changing local political structures has been a vital element in their sustainability. Adoption of formal water management organisations nevertheless allowed customary practice to persist. These organisations seem to be nested into a broader hierarchy of water management and local government that gives an effective flexible interface between general constitutional principles and local needs and customary practice. The pattern seems to be for single-purpose water organisations to interact with other multipurpose organisations for services often acting at a regional level. Nevertheless, difficult questions remain about appropriate technical assistance in irrigation, water supply and conservation. The paper noted the inappropriate technical interventions often made by the state to construct new irrigation and rural water supply systems, and past experiments in degradation control.

Some conclusions on prospects for MFO development and dynamic local institutions

There is a great diversity in organisational forms for water management, and how arrangements for irrigation operations overlap with organisation of other activities (see all papers).

Irrigation needs collective action and organisation in ways that many other activities do not. However, people of authority may be common across activities (see Southgate p 77).

Collective action depends on perceived advantages. Traditions in the scope of group action in different activities influence persistence of collective action, and also responses to change in requirements for collective action (Friend, p 48; Southgate, p 79-84)

MFO's have developed both for service provision and for the planned control of production; the former have been much more successful than the latter (see Southgate, p 84-87)

Local land development and general village empowerment is a third area of work for MFO's, although irrigation may remain managed by a specific sub-committee. This is a prominent area of work by NGO's. They have often promoted a range of functions in village programmes, with a view to more control and integration in livelihood strategies and developing institutional capacity. However, idealised notions about how communities should function and what features groups should integrate may be as problematic for local people as weak or highly atomised single-purpose organisations (see contributions from network members).

The optimal approach in organisational development is to build on a single need which is identified and work from that (see contributions from network members).

Single purpose organisations are more likely because of the division of labour between tasks, and variable access to natural resources by people in a particular territory. They are also encouraged by the sectoral approach of the government agencies liaising with them (Friend p 39; Southgate p 87-89).

The need for services under new commercial opportunities can promote membership in regional-level organisations which play multiple roles in livelihood support (See Southgate p 84)

The evolution of dynamic MFO's has emerged in conditions of freedom in association, in affiliation between groups and in deployment of finance. Equally withdrawal from MFO's is highly likely if their requirements interfere with livelihood options (Friend, p 52-55; Southgate p 85). This freedom of action is more important than availability of financial/managerial resources, although the latter are important in the speed and direction of evolution.

The competence of MFO's in planning, finance and liaison is a critical factor in their acceptance (Friend, p 52).

It is unrealistic to expect multiple functions to be organised entirely in one settlement. Freedom to decide wider spatial associations in organisation of services will encourage more evolution of MFO's (Southgate, p 84).

Participation in organisations improves when people have a clear sense of their rights, benefits and responsibilities, and a sense that irrigation infrastructure belongs to them in reality: also that they do really belong to the group managing the infrastructure. It also improves where people obtain more representative performance from associated agencies. Sometimes it may also be improved when the organisation supplies other personal needs such as status, identity and broader political representation (Friend, p 47; Southgate, p.88).

The dynamism of organisations, and dynamics of organisational change (in functions and structure) depends on the actions of the body vested with general authority. although dynamic individuals may have temporary influence on the scope of activities integrated together in a settlement (Friend, p 56; Southgate, 90).

Irrigation groups may manage the natural resources of their catchments as well as their production. However, just as they need external assistance in new livelihood strategies, they also need advice on land management problems triggered by forces beyond local control. This has to be seen as advice, sensitively evolved, not as instruction (Southgate, p 94-96).

Conceptual models to study local-centre relations in water management

The accompanying work has illustrated three key themes:

- a) the scope and nature of local resource management organisations may have originated from both the range of tasks necessary to get rewards from collective action, and also from the variable basis to group relations underpinning collective action, and their need to gain entitlements to use land and water resources. However, increasingly they also reflect and legitimise the power relations that the contemporary leadership has established within the broader sphere of state intervention.
- b) Irrigation can be considered a form of 'landesque' capital where investments generate more benefits from the land. At issue who determines rights to access benefits from this 'landesque capital', as well as who has rights to obtain these benefits. Local institutions can differ in whether they have 'clan- or territory-based' rights operating to maintain the welfare of a group and its descendants, or individual rights accruing to particular membership households. Collective action occurs not only in engineering-based tasks in construction, operations and maintenance but also in rule-conformance and conflict resolution. The nature of management arrangements may reflect needs and roles in conflict resolution and general management, not only in providing resources for maintenance.

Tension between community and state emerges because the state alters arrangements, either by granting new rights or by failing to uphold older right which allow new elites privileged access. The state can also fail to allow new arrangements wanted by groups. While the state may take up a role in managing resources between communities, its real interest may be to manage water to encompass new demands elsewhere, leaving discontent between and within organisations.

Model One

We can portray these dynamic changes by showing the range of water rights and entitlements present in rural areas, and the range of organisational arrangements as a spectrum of local water management institutions. The state has encroached on these through changing technologies at the same time as intervening in institutions. The state has usually tried to convert water rights as shares or customary quantities, into a conditional rights to a volume. Conditions usually link to conditions of registration, fee payment and maintenance provision. Different problems emerge for external agencies as they attempt to alter and simplify institutions according to a narrow range of preferred arrangements in water rights and organisational structures. This is illustrated schematically by the first diagram. Local irrigation institutions may operate simply through broad-based roles in the community or as specific irrigation entities and evolve between these extremes. Water rights may exist as a spectrum between rights by request through to privately owned rights. In some locations they may change across the year, or there may be different rights on different sources. They may be open to those who live in an area, or only those with membership rights. These rights can be changed rapidly by external intervention, who often prefer to introduce volumetric rights, and rights which are conditional. Instead of rights through affinity or memberships, irrigators may have rights as users, clients or beneficiaries of external action, depending on the political and economic ethos of external intervention.

Other texts have reviewed group-state relations in these different water management contexts¹. Generally speaking the introduction of specific water management entities into customary 'clan-based' arrangements has often brought benefits. The exceptions are where the state has sought to impose standard regulations on new organisations, or where local elites gain dominance over allocation of water and performance of duties. Attempts to reform the private-investment-type irrigation organisations have often been problematic, partly because of over-intensive management reforms, but also because of unexpected problems in changing membership, removing distinctions between members and users and changing membership rights as volumes supplied have increased or decreased.

Imposition of different forms of organisations - their democratic structure, legal conditions of rights and responsibilities, structures of roles etc. - will offer variable prospects to ensure effective management and production in these different water management contexts.

c) The scale of benefits from landesque capital do not accrue from water alone: a range of agricultural services can increase or decrease returns. Equally, in the administration of local water supplies, the local government and judiciary often plays an important role. Sometimes there is a 'water administration' managing legal rights and appointments distinct from an irrigation or public works department responsible for mobilising water sources. Finally, the external agency may be a regional non-government agency, often integrating a range of functions to support communities. So, a second diagram can be drawn to show how local water management reflects the interaction between evolving local practice, and three strands of external influences: water delivery and assessment agencies; agricultural services; and civil and legal forums. In practice, there may be several agencies in each of these categories.

¹ See Vincent, L. (1994) Policies and prospects for hill irrigation, forthcoming

Model 2

The nature of institutional evolution, and performance of institutions will reflect the liaison between these different strands of external influence. Performance will also be affected by differences in the territorial bases to different agencies - for example, administrative or environmental (catchment) boundaries - and the relevance of these boundaries to the needs of local water groups.

In local water management, existence of a multiplicity of structures at provincial level can provide new opportunities for groups to by-pass corrupt officials and gain the help needed. There may be many horror stories of inappropriate interventions by irrigation departments, and of deals between local government and public works officials. However, there are just as many stories of regional and central officials helping local groups to overcome local administrative and legal problems. Local people can be very adept at 'playing the state or the NGO', and changing opportunities to access resources and power with state disengagement will be of important issue in decentralisation policies.

This model can also be used to study how different groups have access to different services. For example, will this battery of regional agencies combine to help or thwart the poorest and least represented groups in a catchment? Is help imbalanced between support to the commercialised, high-external-input farming systems and interventions to help low-external input groups? If there are already weaknesses and inequities in local or regional management, how will variable decentralisation activities affect these conditions?

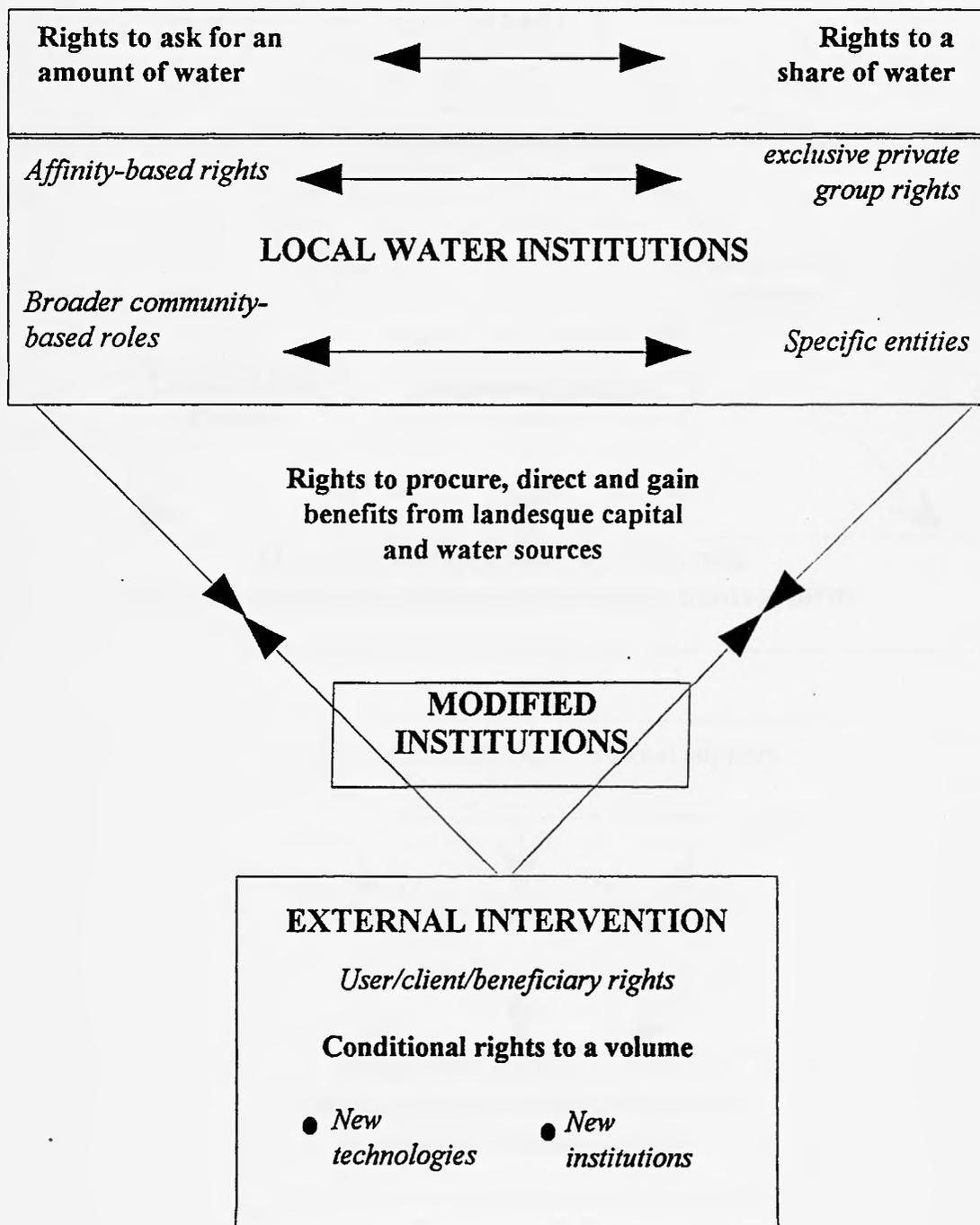
This second diagram thus helped define the next round of work in the WRF programme. Firstly, we can look at the nature of interactions between groups of poor water users in relation to their water institutions, and the adequacy of existing external interventions to change institutions and livelihoods. In working paper 7, we suggested this could be done in relation to external dependencies of local water users.

Secondly, we can pose questions concerning the impact of decentralisation of responsibilities and withdrawal of agency support on different groups. Of particular concern will be whether changes will occur differentially between the different external streams of interaction. For example, what would be the implication for different water user groups in a catchment of withdrawal of public works and agricultural services with a strengthening of local government? What are the implications for new highly decentralised or private agricultural service agencies if public works and water management still stay in a highly centralised, hierarchical structure?

These models and questions will inform the choice of more detailed case studies in the WRF programme.

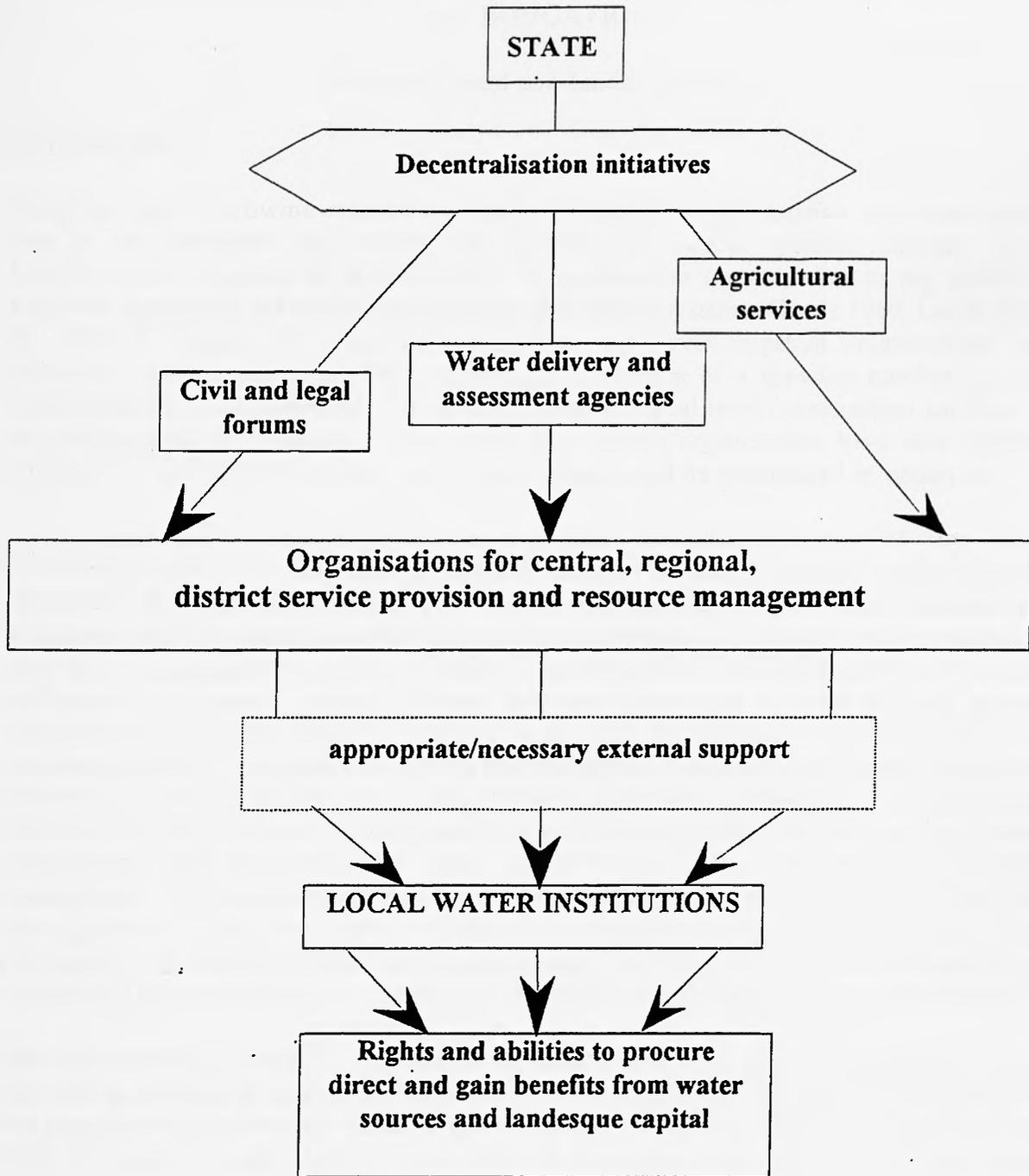
Linden Vincent, Richard Friend and Christopher Southgate

Model 1 : Dynamic interaction and change in water management arrangements



Source: Vincent, L. (forthcoming) Policies and Prospects for Hill Irrigation
 Vincent, L.; Friend, R. and Southgate, C. (1994) Diversity and Change in Local Water Management Institutions. RRRRP Working Paper No. 7

Model 2: Interactions in state engagement and disengagement in water management



Source: Vincent, L.; Friend, R. and Southgate, C. (1994) Diversity and Change in Local Water Management Institutions. RRRRP Working Paper No. 7

Paper 1

WHAT'S IN A NAME? ORGANISATIONS AND INSTITUTIONS INVOLVED IN THE MANAGEMENT OF IRRIGATION

Richard Friend and Linden Vincent

Introduction

There has been a growing emphasis on the role that field level irrigation organisations can play in the sustainable and efficient management of irrigation systems (Coward 1980a, Uphoff, 1986, Bagadion & Korten 1985). This realisation is partly due to the wealth of evidence concerning the operation of traditional irrigation systems (Geertz 1980, Leach 1990, Siy 1990 & Spiertz 1991), and of participatory local level irrigation organisations. The increasing disengagement of the state and the emergence of a growing number of civil organisations has also renewed interest in the roles that local level organisations can play in the management of irrigation. The lessons of irrigation organisations have now inspired interest in what further functions local organisations could be encouraged to undertake.

Development policy does not occur in a political vacuum. Discussion of local level organisations for the management of natural resources is closely linked to wider debates concerning the relations between civil society and the state. As the state increasingly disengages and the market becomes the dominant mechanism for the allocation of resources, new civil organisations emerge. Despite commitment to decentralisation and farmer participation it remains unclear whether this trend represents a move towards greater self-reliance or towards greater co-optation by the state. By handing over responsibility for the management of irrigation, the state is able to reduce its own financial commitments and ensure more efficient irrigation management. There is often only superficial acknowledgement of the relationship between the rural periphery and the state centre, and between local water organisations and the centralised public administration in the literature on irrigation management. The organisational structure of national politics has entered a new era with the disengagement of the state, reform of the state administration and the growth of private (voluntary) organisations. In reviewing organisation types involved in irrigation management, the national political context in which such organisations operate will be a constant reference.

The management of water for irrigation is the management of a vital and sometimes scarce resource. In discussing local organisations for the management of irrigation issues of power and production are inevitably raised. Irrigation water gains value in what it can produce. The value of water is clearly linked to the value of the various other agricultural inputs and outputs. The importance of irrigation as a constituent of national development planning is not simply the more widespread provision of irrigation, but increased agricultural output. Irrigation organisations and other local organisations, whether they like or desire it, are increasingly becoming involved in issues of state/civil society relations (Korten 1989).

Socio-Cultural Dimensions of Irrigation

Irrigation has several overlapping dimensions that must be considered:

- i) the physical environment
- ii) the technology used

- iii) the irrigation management organisations
 - iv) and their relationship with existing cultural values and norms,
 - v) the relationship between the organisations and state bureaucracy
- (points i,ii,iii and v from Wade 1990)

The appreciation of the significance of socio-cultural values is a fairly recent development. The current emphasis on socio-cultural aspects of irrigation management is largely a response to earlier approaches that regarded irrigation management as a technical issue, often with adverse results. While the current 'institutionalist' approach (Apthorpe 1984) is welcome and necessary, it is not without problems and limitations of its own. As with any analytical approach it represents a particular discourse, the origins, predispositions and assumptions of which often become obscured.

There are certain tendencies within this 'institutionalist' approach which need to be discussed. A central theme in the literature on irrigation organisations is the need to base organisations on institutional models that are compatible with existing cultural norms and values. There is considerable interest in the factors that influence the ability of people to organise and whether irrigation organisations are the basis of collective action or whether they are manifestations of wider co-operative norms and values.

Along with the management of forestry and pasture land, the management of irrigation is perhaps the best documented of local level collective organisation. Collective action in all these types of activity is based around the concept of a 'common good'; a resource that is essential to communal survival and that cannot be managed on an individual basis. The motivation for collective activity is based upon some sense of shared interest, and on the expectation that other people's behaviour in such action can be predicted to operate according to widely held norms and values. There is a great deal of evidence describing ways in which rural people have organised themselves for the management of a common good (eg. Ostrom 1990, Bromley 1992). There is remarkably less contemporary evidence describing how and why such collective management breaks down.

The traditional institutions that have governed collective action in the past, and that are nowadays advocated as being the basis for successful collective action of the future, are often the very institutions that are most vulnerable in contemporary society. The processes of commercialisation, commoditisation and the penetration of the state into rural areas have had widely recognised effects; rural-urban migration, increased landlessness and tenancy, increased indebtedness, increased social and economic differentiation in rural areas, and increased competition over natural resources. How these phenomena influence traditional institutional bases for rural organisations remain less well documented. In proposing organisational models for collective action the causes of the pressure on collective action must be addressed. The sustainability of organisations for the collective management of natural resources rests not only on their compatibility with traditional norms and values, but on their adaptability.

The emphasis on socio-cultural values tends to treat such values as absolutes, often with inadequate attention to change and the political dimensions of such values. It focuses on established values and not on how values are established and enforced, what socio-political interests these values serve, and in what wider political context they operate. Discussion of values and norms is inevitably not value-free. For example, there is much talk of the need to

found irrigation organisations on 'traditional' institutions. Somehow it is implied that tradition can be interpreted in a value-free manner. It is assumed to be unchanging or at least able to transcend change. By assuming shared values and norms to be established in tradition, institutionalist approaches ignore the way that the concept of 'tradition' itself (and norms and values more generally) can be manipulated for political ends.

As the state is seen to disengage from irrigation management there is growing recognition of the potential of alternative organisational structures. It is often unclear in the literature on 'turn-over' of existing management systems or creation of others, to whom these irrigation systems are being turned over. It is equally unclear what these organisations are, and what they do. Part of this confusion is due to the wide range of titles of irrigation organisations, and the huge variety of organisation types. Analysis of local organisations has tended to be dominated by the desire to establish widely applicable organisational models, with insufficient attention being paid to the dynamics of existing organisations.

This paper will consider some of the hidden assumptions of the institutionalist approach. It will begin by looking at the ways in which institutions and organisations have been defined and labelled, and the range of titles that have been bestowed upon local level organisations. Part three will focus on the types of organisations that are involved in irrigation management by considering them according to the criteria of origins, evolution, functions, structure, and rules and roles. The final section will consider how the performance of irrigation organisations can be evaluated by drawing on conclusions from the earlier sections.

Institutions and Organisations

The debate on irrigation management focuses a great deal of attention on appropriate institutional and organisational models. However, there is often no clear sense of the way in which 'organisation' and 'institution' are defined in the literature, nor of the way in which they gain meaning in rural society. The issues tend to be presented in a depoliticised, managerial discourse. Yet irrigation operates to varying degrees and in different contexts as a vital resource, the control over which reflects and influences social relations of production. The way in which organisations and institutions are interpreted have implications beyond the discourse of depoliticised management strategies.

In attempting a review of organisation types involved in the management of irrigation one is very soon struck by the range of titles of such organisations. Yet an evaluation of irrigation organisations requires more than the assumption that similarly named organisations can be compared on an equal footing.

Organisations, Institutions and Roles

Inconsistencies in the use of key terms run through the debate on irrigation organisations. The greatest confusion has been over the use of the terms 'organisation' and 'institution'. Some authors have drawn a sharp analytical distinction between organisation and institution while others, and sometimes the same authors, have used the terms interchangeably. The issue of how terms are defined and applied, and what connotations they hold is not one of abstract academic interest. The application of terms has a potent ideological dimension, the denial of which is itself symptomatic of a particular 'depoliticised' ideological approach; one that is

particularly evident in contemporary development policy. There has been a marked tendency to use words and concepts without an appreciation of the ways in which they 'have symbolic as well as denotative importance in the political arena' (Samoff 1990 p.515). These issues are seldom made explicit.

Often those writing about irrigation organisations have overlooked the complexity of social organisation in rural society and have focused on irrigation in isolation from other social activity and relations. This analytical trend is in many ways linked to the history of development bureaucracies from colonial administrations to those of newly independent states, and the emergence of line ministries with specific responsibilities (eg. forestry, fisheries, irrigation). The future of such line ministries and of their employees has relied upon the clear division of labour between them, encouraging a self-interest and tunnel vision. As bureaucracies become increasingly established and complex, and their codes of practice become increasingly institutionalised there is a growing emphasis on the role of formally registered organisations with which they can work.

Korten (1989) has acknowledged that many of those writing about local/community organisations have come from the disciplines of public administration and management. They have displayed a well-intentioned naivety of the full political dimensions of development. Even in acknowledging earlier shortcomings, it is unclear whether they truly appreciate the full extent of the political dimensions of development strategies; particularly of grassroots oriented strategies. They have tended to talk of institutions and organisations in an idealised and abstract manner which often seems to have little bearing on the realities of how people act. The alternative language between 'collective action' and 'management task performance' reflects the different disciplines involved in studying irrigation management and their differential involvement in development administration.

For most authors a distinction is drawn between institutions as 'complexes of norms and behaviours that persist over time by serving collectively valued purposes' (Uphoff 1984), and organisations as 'structures of recognised and accepted roles identified and performed by and for members' (Garforth 1990 p.19). In this way the norms, values and rules are separated from the structure of roles. Or as Apthorpe has argued, the distinction is made (but too often not fully appreciated) between 'the rules of the game' (ie. organisation) and 'the rules of the rules of the game' (ie. institution). Institutions are seen as the basis for organisations, and as organisations become established and representative of established norms and values, they too become institutionalised. Indeed, Garforth and Munro (1990) argue that the sustainability of organisations rests on their becoming institutionalised.

Yet the distinctions between institutions and organisations are often blurred. One practical source of confusion may be the expectation that collective action is always coordinated within an identifiable separate social entity existing only for irrigation. In fact, there are a number of locations where irrigation activities have been performed within a broader custom-based local management system. There are irrigation institutions (rules and roles) but no specific organisation, or only specific 'sub-organisation' for certain actions (notably maintenance). While specific roles may exist for special irrigation functionaries, and collective action may be mobilised specifically among irrigators, many roles are performed by representatives playing multiple roles in rural life. These have been most prominent in locations with 'clan-based' or 'territory-based' institutions (institutions based on affinity). Examples for irrigation

were found in Sumatra (Ambler, 1989), Morocco (Mahdi, 1986), the Luzon highlands of the Philippines (Bacdayan, 1974; Prill Bret, 1985), Peru (Guillet, 1991; Isbell, 1978) Madagascar (Bloch, 1975) Tanzania (Gray, 1965) and Sri Lanka (Leach, 1990). Many of these locations have experienced emergence of specific irrigation organisations, either through state imposition or practical use of legal opportunities to protect and assure water rights to the group. Collective action is a means to express identity as well as reproduce property rights and ensure that necessary activities are performed.

However, there are many locations which have specific entities for irrigation management, with an entire structure of rules and roles administered within the irrigation group, often quite separately from other rural activities. The best known examples of these are the *zanjeras* of the Philippines, the *muang faai* canal groups of Thailand, the Balinese *subak* and some of the hill canal systems of Nepal. While some of these had roots in kinship connections and non-exclusive membership, they are now certainly rooted into individual property rights. This issue of property rights is discussed further in section 3. Collective action has been necessary to raise high levels of resources needed for the infrastructure and rituals of these irrigation systems, but also served to reproduce and ensure production through managing an agricultural calendar. Specific entities often emerge through the granting of land and water rights by agencies of higher authorities, as well as through systems of resource mobilisation. For example, *zanjeras* and *subaks* were both entities defined by external approval as well as resource needs, even before the emergence of the modern state (Siy, 1990; Lieftrinck, 1969).

While collective action in these groups can remain an expression of identity, it may often express an externally-directed facet of local power and separateness rather than internal identity for group members. These entities have also taken on new forms of organisational identity, as part of required registration, means of legal protection or means to obtain state assistance. However, their experiences have been somewhat different to broader custom-based systems. These conditions may also give the state different reasons to intervene in collective action.

States may introduce standard legislation for irrigation group registration, or allow a variety of forms of organisation to be registered. However, behind this body of organisations will exist a range of past experiences with institutions and organisations that help explain the current dynamic of change in internal and external relations.

The following section reviews the way in which institutions and organisations have been defined. The ways in which these definitions have been applied will expose some of the confusion emerging in the literature.

Institutions

The term 'institution' generally denotes the rule dimension rather than the role dimension. However, it is a complex term and is used in a range of contexts. While not expecting a precise, universal definition authors' interpretations of 'institution' are not always made clear, and there is often considerable inconsistency in its use. The distinction between institution and organisation is often cloudy and hence the understanding of how people come to act collectively can become confused.

As with many terms, 'institution' is used in particular academic fields but also has a more general use. Dictionary definitions refer to 'institutions' as rules, norms and values; organisations and even buildings housing those organisations (Chambers Twentieth Century Dictionary). Such multiple usage is a great source of confusion, as Apthorpe writes;

'Key words may have quite ordinary as well as coded meanings.....It is when key words become routinized and ossified through repetitive use in these special, value-added, senses that terms become opaque. They can then conveniently be thrown like stones at the initiated. In development and policy positions they frequently are. Transparency to the habitual user insider can as well be the very opposite to the outsider' (Apthorpe 1984 p.128)

The often casual manner with which the term institution is used in strategies such as 'institution building' obscures the fundamental complexity of the concept.

Institutions, as rules, norms and values form the basis for an organisation. But as the organisation becomes established, its objectives and activities become more widely understood and accepted, the organisation can be said to become institutionalised. In this way, although 'institution' is used to denote norms, values and rules it is also used to denote a specific organisation. For example, the Church (and also the World Bank) is often referred to as an institution, rather than as an organisation. Once certain concepts and styles of practice become established, they too can be said to become institutions. For example, Biggs (1992) refers to an interdisciplinary field trip, or 'combined trek' (p.75) as an 'institution'.

Ostrom (1990,1993) is a keen advocate of the 'institutional perspective' in irrigation management and governance. She acknowledges that the term is used with three particular meanings:

- i) as a specific organisation
- ii) established human relationships
- iii) rules to order specific relationships

For her, institution has meaning in relationship to how people actually organise. She defines institution thus,

'an institution is the rules actually used (rules-in-use or working rules) by a set of individuals to organize repetitive activities that produce outcomes affecting those individuals and potentially affecting others.' (Ostrom 1993 p.4)

By adopting such a functional definition, she is arguing that rules have meaning in how they are used in organised activities. Ostrom tends to avoid the ideal dimension of rules, and how rules are open to multiple interpretations often having an influence that is not immediately apparent. There is a complex process by which rules are given meaning, how they become established, and how they are followed, evaded or ignored. Ostrom focuses on 'rules in use' suggesting that these rules (or for that matter, any rules) can be isolated and identified. There is a point at which this type of interpretation only reveals part of the picture. By ignoring the process by which rules are established, she presents an image of shared norms and values being adopted because they are shared. But perhaps the most important question is how do norms and values become shared, and what do we really mean by 'shared'. There appears to

be confusion over the multiple levels of rules eg. between the rules of the game, and the rules of the rules of the game. Norms and values also have both an ideal and actual dimension, and it is often very difficult to separate one from the other.

Mahdi (1986) writes of Berbers in Morocco talking with great conviction of the norms and values of Berber society, but in the next breath talking of how these norms and values can be avoided. The circumventing of these established shared norms and values rests upon the norms and values of evasion of orthodoxy. This contradiction between what people say and what people do is not new to anthropology and has inspired many lengthy debates as to the meaning and method of social enquiry. However, there is very little evidence of these debates in the literature on irrigation organisation. Too often the viability of institutions is seen in the degree to which norms and values can be considered to be shared, with no consideration of the mechanisms by which interpretations of values acquire a sense of legitimacy and orthodoxy, or of the range of meaning attached to these 'shared' norms and values. There is an obvious lack of detailed case material that explains how norms and values are established, challenged and reinvented. There is also very little ethnographic-type evidence that details the circumstances under which traditional institutions for collective action break down.

In irrigation interventions, there has often been misunderstanding of this institutional complexity of both theoretical and actual rules. In the aforementioned Berber study, complexity is not seen as a multiplicity of rules and regulations, but rather a fluidity to adapt water rights and systems of conflict resolution to the needs of the moment, to preserve harmony rather than destroy it (Mahdi, 1986). Indeed, demands for strict adherence to rules is often a sign of crisis. What exists is complexity of case law, with careful preservation of institutional memory, rather than a rule book. Introduction of standardised complex bye-laws, and loss of disappearance of roles that maintained institutional memory are elements in the breakdown of collective action, in addition to loss of specific physical opportunities such as weir repairs.

All too often irrigation literature minimises the significance and complexity of certain social phenomena by the casual use of such phrases as 'conflict resolution'. The idealised way in which institutions and organisations are often presented makes it hard to imagine how any conflict arises in the first place since all members of an organisation have shared norms and values. This simplistic analysis allows us to overlook the complex activities and manoeuvrings that ensure conflict is resolved, the hidden ways in which conflict arises, and the concealed forms of everyday resistance (cf. Turton 1987). These are the very types of activity that are not always evident to the outside observer, but that are essential for a comprehensive understanding.

Organisations

There is great variety among irrigation organisations, not least in the names by which they are known. Various they have been termed as 'water users associations', 'groups', 'organisations' and even 'companies'. Alternatively the emphasis has been placed on the members being farmers as opposed to water users, or the emphasis has been on the 'irrigators' as opposed to mere 'water users' or 'farmers'. There have also been combinations of the above strategies, for instance in the Cooperative Irrigation Team, or in the Farmland Improvement Association (in South Korea). Sometimes it is the looseness of the organisation that seems to

be emphasised (eg. in the use of terms such as 'association' or 'group'), while in other instances collective organisational and ideological characteristics are emphasised (eg. in the use of 'cooperative'). The traditional basis of the organisation is also highlighted by the adoption of traditional terminology (eg. *subaks*, and *zanjeras*), thus giving a sense of legitimacy to organisations that are often more contemporary innovations than their titles would suggest.

The definition of organisations is again complex and inconsistent. As with 'institution', the use of different definitions of 'organisation', and of organisational types has both a denotative and connotative dimension. Some authors such as Mase (1990) have felt content to dismiss the significance of this range of terminology, preferring instead to emphasise the importance of the substance of the organisation. Ostrom (1992) has also focused on critical features common to long-enduring institutions for common property management. These include clear functions, clear legal rights and responsibilities and clear means of control, and clear structures and boundaries to these functions, responsibilities and control.

The emphasis on substance rather than appearance is useful. However, overlooking the significance of the terms that are used minimises the wider ideological context in which development planning occurs, and thus obstructs a comparative analysis of organisational types. It can confidently be asserted that the title of the organisation does not necessarily reveal much of the organisation's character. Shah and Bhattacharya (1993) note that in Gujarat irrigation companies operate more like 'cooperatives' than the formally registered cooperatives who themselves display minimal levels of cooperation and accountability. But this observation raises the issue of what connotational meanings are associated with particular organisation names, and what importance this has in the process of gaining formal recognition (or evading state intervention).

The growing emphasis on organisations is very much a part of the wider process of bureaucratisation and the development of complex nation states, and administrative and political structures. For Robertson (1984) development plans are as much ideological statements as technical plans. Historically, emerging nation-states and governments within these states regarded development planning as a means of strengthening national cohesion within a particular ideological framework, and as an articulation of the nation state. The organisations that the state encourages can be seen as reflections of the ideology of state planning. For example, the cooperative movement in post-colonial Africa was not simply the adoption of a particular style of management but also a political statement on the direction of social organisation of the newly independent nation states. Accordingly there is a growing need for legal recognition within the framework of established organisational types.

Clearly, as Mase (1990) argues, we cannot expect the title of the organisation to reveal very much, but we should not overlook the ideological connotations of that title. The state may wish to mobilise water users to perform certain functions in irrigation management but encourages collective action in clearly specified areas. Or there may be a desire to build on irrigation organisations and to extend their functions. There is often a need to balance between encouraging functionally-oriented grassroots mobilisation, and between encouraging too much self-reliance and political assertiveness. Equally, water users must balance the desire to encourage collective action, the practical requirement to organise themselves in as

non-confrontational a manner as possible, and to avoid excessive and inconvenient organisational activity.

Definitions of Organisation

Several authors do attempt a definition of 'organisation' that goes beyond that of a system of roles. Esman and Uphoff (1974) define a local organisation as;

"an institution of local governance, such as a co-operative, which has some accountability to a local constituency, which represents local interests and in which local people can participate" (Esman and Uphoff 1974 p.)

They purposively adapt the notion of a system of roles to incorporate the concepts of leadership and accountability. However they manage to leave the definition fairly broad by the use of the phrase 'some accountability'. Accountability does not necessarily imply that those to whom the leadership are in theory accountable have an equal power of veto.

Kiggundu (1989) does not regard the failure to reach a universal definition of 'organisation' as problematic, but sees it as a possible source of strength. He defines an organisation as:

1. an organic social-technical entity;
2. which is mission driven and goal directed;
3. which at any time has a deliberately structured activity system;
4. with an identifiable boundary or boundaries;
5. which has generalised and specific task environment(s); and
6. which has various internal and external actors and stakeholders (individuals, groups, other organisations) with specific needs and expectations in exchange for contributions to the organisation's survival, growth and development. (Kiggundu 1989p.16)

Kiggundu draws some influence from biological science, recognising that organisations like living organisms can 'grow, decline, decay and die'(p.16). Although this analogy incorporates the possibility of change it is still limited. The processes that influence the growth, decay, decline and death of living organisations are physical, environmental and technological and also social, political and economic. Goals, boundaries and tasks remain subject to interpretation and reinterpretation. Organisations both influence and are influenced by the individuals, groups and other organisations that operate internally and externally.

The themes of mutual commitment to an objective, of accountable leadership and adaptability are common features of definitions and analysis of organisations and institutions.

Different Types of Organisation

In this section the usage of the terms 'association', 'collective' and 'cooperative' will be considered. In reviewing the types of organisations involved in the management of irrigation we must be aware of what the titles of organisations do and do not reveal, and the political history of the rise of certain organisational types. The history of rural organisations and the responsibilities they undertake can not be divorced from the history of nation building and the tension between the urban centre and rural periphery, and state/civil society relations.

Organisations as systems of roles can display considerable variation of the degree to which they are structured, often within the same geographical area. A distinction is often made between 'formal' and 'informal' organisations, depending on the degree to which organisational activities and roles are governed by 'explicit, written, possibly legal requirements' (Uphoff 1986 p.6). This type of interpretation of formal organisations can allow too great an emphasis on culturally specific understanding of 'explicit requirements'. The complex and often highly structured roles and patterns of behaviour that exist in rural societies can often be overlooked and dismissed as being 'informal' when often they are governed by highly structured codes of behaviour based on kinship, gender, age and class. These may be 'informal' to the outsider, but highly structured and more binding than formal legal codes, to the insider.

Landau (1990) considers 'organisation' as a continuum 'from primary groups to large formal organisations' (Landau 1990 p.62). The distinction between formal and informal organisations is thus a distinction concerning the size of organisations, and between organisations that gain official recognition and those that do not. Official recognition of organisations is also a mechanism by which the state or state authorities can gain political and managerial influence, and ensure rural peoples activities are incorporated into national strategies (Garforth 1990, Landau 1986). Formal recognition can give organisations access to resources from the state, but there is also possible tension between self-reliance and co-optation. Despite the widespread emphasis on decentralization and participation, and the disengagement of the state, the establishment of officially recognised and registered local organisations can, on the contrary, prove to be an efficient mechanism ensuring greater state control and penetration of rural areas (Hirsch 1989). However, rural people should not be regarded as being completely passive. There is also evidence of rural people being able to 'play the rules of the game' (and to 'play the state' and 'to play NGOs') in order to gain access to resources. Organising according to officials' criteria is an effective strategy in this 'game' (Vandergeest 1993) and is an example of how state rules can be manipulated.

Associations

One of the most widely used terms in irrigation management is that of the 'water users association' (WUA). The term 'association' generally implies a loose organisation, yet despite its widespread usage in irrigation management literature, its precise definition remains obscure.

Such has been the use and abuse of organisations in irrigation policy, that many authors prefer to use the term 'association'. However, it is often used loosely across the same spectrum of representative and purposive entities just described for 'organisations'.

Curtis (1991) classifies an association as a specific type of organisation. For him the determining characteristic is the ability of the members to exclude non-members, to impose sanctions on members including their dismissal from the association. He writes:

'An association is any form of organisation or social arrangement for common benefit which depends for its strength upon the ability of participants to exclude those with whom they do not wish to associate' (p.31)

Among organisational types, 'association' is perhaps the most neutral term, combining elements of organised structure with a sense of looseness and flexibility.

Co-operatives

There is such a large number of organisations that are referred to as co-operatives, that the term can be considered at one level to be 'purely nominal' (Esman and Uphoff 1974 p.62) However, the cooperative movement is linked to a particular historical period and had an explicit ideological motivation. For Curtis (1991) it was a particularly western model of organisation that owed more to the historical, political and economic particulars of the industrialised west than to many of the countries that adopted rural cooperatives in the post-colonial era.

There is a great variety of co-operatives throughout the world. Some are involved in supply, production or are service-oriented, while others combine activities. Some are single or multi-functional, some have legal recognition, and some are established by the state while others are more 'grass-roots' in origin. The difficulty in arriving at a universal definition of a co-operative is largely attributable to the ideological inspiration for many co-operatives. Thus there is often an essentialist (Apthorpe 1977) approach to definition which seeks to isolate the key features of a co-operative, in order to dismiss those organisations that are termed 'co-operatives' but which, in the eyes of the definer, are not 'true' co-operatives. Co-operatives that failed to meet co-operative objectives can then be dismissed because they were never co-operatives in the first place. In this way the ideology of the co-operative is justified, and any attempt at evaluation rendered futile as all those organisations that fail do so because they are not co-operatives. A commonly cited definition of a co-operative is taken from the ILO.

'A co-operative is an association of persons who have voluntarily joined together to achieve a common end through the formation of a democratically controlled organisation, making equitable contributions to the capital required and accepting a fair share of the risks and benefits of the undertaking in which members actively participate.' (ILO 1966 para 12)

This definition emphasises the voluntary origins and democratic structure of co-operatives. Co-operatives imposed by the state were therefore not 'true' co-operatives. But rather than seeking an essentialist understanding of co-operative, perhaps we should be asking what these organisations tell us about relations between rural people and the state, and state development strategies.

The co-operative movement of East Africa has already been mentioned in passing. Rather than being an organic 'coming together' of like-minded individuals, the cooperative movement was a state-imposed strategy that acquired a 'quasi-religious character' (Apthorpe 1977 p.2). There was very little co-operation within these cooperatives and they largely became what Apthorpe (1977) has called 'coercitives'. However these co-operatives can be seen as ideological statements. The cooperatives served their political purpose as statements of the positive value of collective organisation (almost irrespective of their success or failure) and as expressions of the state's political agenda and basis of its political legitimacy. Cooperatives were an expression of the transcendence of the new nation states over ethnic, religious rivalry. Curtis

(1991) argues that they were also expressions of the capacity for African people to organise in the face of the white and Asian agricultural monopoly.

The co-operatives were evaluated in a rather unfavourable light in the late 1960s and 1970s. It was found that they tended to mirror existing social differentiation, being dominated by rural elites, with few, if any of the benefits accruing to the poorer members (see, for example, Seligmann's 1986 study of cooperatives in irrigation systems in Huanquite, Peru). They were inefficient and expensive in supplying the inputs required, and offered state and co-operative officials opportunities for personal advancement. These failures have been explained in many ways;

- as exemplifying the fundamental weakness of co-operative economic action;
- because their objectives were too diffuse;
- because their membership was too wide;
- because the membership lost faith in the co-operatives' institutions (and saw co-operatives as mechanisms of state penetration into rural areas cf. Hyden [1983] on East Africa) (see Hulme and Turner 1990).

Other examinations of co-operatives have focused on the potential of collective action. Such an approach emphasises the conditions under which collective action can be successful. In this type of analysis the shared norms and values, and the sense of commitment of members are considered to be the determining factors. By approaching the issue in this way certain conclusions can be made. A close knit group of people with limited and clearly defined objectives and functions is likely to be more successful than one with several (poorly defined) objectives and functions (Greeley 1980). Almost by definition this appears to be true. Yet these findings have other implications. For example, these findings seem to suggest that co-operatives may not be able to transcend the ethnic divisions that they were often intended to transcend.

Collectives and Communes

Collectives and communes are usually understood in the context of socialist ideology, representing the socialist alternative to the firm (Curtis 1990). The collective was an integral part of an ideological movement in a particular historical period. The collective ideal was applied in different ways in different countries. In all the countries that adopted the collective as part of the national development strategy, there has been at least some degree of decollectivisation.

Collectives tended to be large-scale, divided into several layers. Despite the ideological call for co-operation it was a model that was usually imposed by a strong central administration. Curtis (1990) presents an ideal type definition of the collective farm and the commune as,

'large organisations with several layers of collective activity. At the base is a work team or brigade which is a basic unit of accounting and normally dedicated to a particular activity. Then there is a collective organisation at enterprise level, be it farm or firm. Above that is a farm or commune, consisting of several enterprises within a geographic area and carrying various educational and welfare functions as well. This is the equivalent of the

lowest tier of local government in the capitalist world except that it carries responsibility for productive activities as well as welfare.' (Curtis 1990 p.143)

Collectives and communes are distinctive in the wide range of activities that they take on.

The history of collectives is a reflection of the relationship between the state and the peasantry. In Tanzania the collective movement was tied to a wider process of villagisation that sought to extend state control through the restructuring of rural society in bounded territorial units. The revolutions in China and Russia had very different relationships with the peasantry. The Russian revolution was more formally based on 'classical Marxism' which regarded the urban proletariat as the revolutionary class, and the peasantry as essentially conservative. The collectivisation process in Russia was certainly influenced by the state's objective to mould the peasantry into a revolutionary class, and to control rural opposition while increasing agricultural productivity.

Under the leadership of Mao Ze Dong the Chinese revolution broke with 'classical Marxism' and the Russian revolution. Mao fought a prolonged battle within the Chinese Communist Party to base the revolution on the peasantry rather than on the urban proletariat. During the civil war the Chinese Communists lost control of the cities and were limited to control of the largely rural Southern states. Realising that their only chance of victory rested upon the support of the peasantry, the collective movement in China that originated in the land reform policies during the civil war tended to be more responsive to the demands of the peasantry.

Despite the differences there are some similarities. The collectives and communes operated on a large scale. They all had to deal with the problems of incentives and rewards in order to gain the compliance of their constituents. Curtis (1990) argues that 'collective enterprises.....have in both USSR and China been a consciously participative and sharing body" (p.152). Clearly such an analysis rests upon his understanding of 'participative and sharing'. It is a judgement on the collective movement that is not without its critics. It would be dangerously naive to assume the Russian and Chinese collectives to have been participative and sharing when they existed on such a large scale and within highly non-participative national political structures. However it would be equally unfair to completely dismiss the collective movement.

Summary

The concern with building organisations on appropriate institutions has highlighted the need for irrigation organisations to have some sense of legitimacy in the eyes of the organisation's members. While this approach has exposed the inadequacies of imposing inappropriate organisational structures and functions, there is a marked tendency to treat concepts of institutions and organisations in a far too idealised manner with inadequate attention to conflicts of interest in the interpretation and implementation of institutions and organisations.

However certain key features of appropriate institutions and organisations have been discussed;

- the need for mechanisms of conflict resolution and decision making
- the need for mechanisms of resource mobilisation and allocation
- the need for accountable leadership

- the need for links with irrigation bureaucracy

Organisation Types

As has been mentioned in the previous section, the inconsistency with which the terminology of irrigation organisation types has been used creates many problems. For example, a simple comparison of cooperatives with companies would soon confront the problem of determining to what extent these two categories of organisation actually operate in the way that we would expect from their titles. It is therefore also necessary to consider the origins of organisations, what types of activity they are involved in (eg. supply, production or marketing activities), and the structure of the organisations. In this review we will consider organisations according to the following criteria: their origins, evolution, structure, functions, and roles and rights.

Origins

From what basis does collective action evolve and sustain itself? A number of powerful anthropological debates have taken place around the influence of different forms of affinity, and of forms of property rights, which are also manifested in irrigation studies (Bloch, 1975; Coward, 1983; Leach, 1990). While kinship or lineage is the best known form of affinity, this can also reflect territorial occupation and sometimes even class identity. This brings us into distinctions between clan-based institutions and private property based institutions, and distinctions between rights because of belonging to a group, and rights through personal investment of resources. The issues of property rights within the organisation, and of ownership of the infrastructure and the responsibilities that such ownership entails are themes that underpin debates on irrigation organisation.

Research from well-established canal systems in Laos, Thailand, the Philippines and Nepal led Coward (1977, 1979, 1985) to analyse water rights as a form of property rights, and examine these property rights as a basis to irrigation management arrangements. Coward saw the organisational arrangements of many schemes as a reflection of an underlying property grid, formed during the initial period of construction. Water rights in particular were seen to be related to investments in the construction, operation or maintenance of schemes.

This work also led to studies on the responsiveness of institutions to change. Dani and Siddiqui (1987) made a series of hypotheses about how irrigation institutions evolve. They suggested that while they do respond to growth and externalities, the change will still reflect underlying property arrangements and pre-existing organisations. Also that external interventions will only succeed to the extent that they build on existing institutions.

Coward (1983) argues that 'the creation of the irrigation works establishes among the creators, property relations, which relations become the basis for their collective action in performing various irrigation tasks'(p.4). He refers to property rights based in water as 'hydraulic property rights'. He argues that ownership of and responsibility for hydraulic property coincide, and where non-owners have usufruct rights they make some kind of payment to the owners. Coward's concept of 'hydraulic tenure' has been a critical factor in understanding the management practices of many existing schemes, where rights to water are related to resource inputs. This involves a view of irrigation as a form of 'landesque capital' -investments that give greater outputs from land and increase the value of the land. Under 'hydraulic tenure' the

benefits from investment in irrigation accrue to the individuals, and their descendants, who have taken part in the investment and current management. Procedures for current management demonstrate and reproduce these property arrangements, and collective action reinforces the rights of the group performing the action. When state intervention has reduced or removed these tasks - through weir construction and performance of maintenance - collective action declines. With such action the structure and authority of pre-existing management arrangements can also decline. These findings have been instrumental in promoting participation in design and construction of new schemes, and ensuring ongoing participation in rehabilitated schemes, to maintain local management capacity and scheme performance.

Hydraulic tenure can explain some of the variety of institutions found in irrigation. Among 'affinity-based' groups, infrastructure may be managed for the welfare of the group as well as individual rights. Thus there may be no absolute rights for individuals, and customary individual rights may be over-ruled at times of difficulty - as in a severe drought where subsistence crops are treated. Good examples of these arrangements are the 'irrigation auctions' present in parts of Peru (Isbell, 1978; Guillet, 1991). In both of these patterns, water rights may be associated with lineage members or territorial occupants rather than blocks of land, so people can move rights if they acquire different lands.

However, where infrastructure has been developed as a private initiative by a specific group, then it is common to find rights as shares which persist over time for particular households regardless of qualities available in the system. The clearest examples of infrastructure developed specifically for the private gain of an exclusive group come from Nepal (Martin and Yoder) - although it should be noted that Nepal has a diversity of scheme types. The *zanjeras* of the Philippines are another example of a specific investment group, although for some *zanjeras* the performance of collective action to maintain an irrigation system may enforce their land tenancy rights, not only their water rights. In both these examples from Nepal and the Philippines 'members' with water shares' can be distinguished from ordinary users. Those with only 'usufruct' rights in these schemes have an entirely different status from clan-based systems where usufruct rights are only available.

External interventions have shown poor understanding of these different property arrangements, especially those operating for group welfare rather than individual profit maximisation. Indeed, many interventions have looked to transform institutions to enable greater personal action. As Bloch (1975) pointed out, overemphasis on concepts of property, narrowed to promotion of private property and profit maximisation, has led to misunderstanding and damage to groups still using communal affinity-based arrangements. Many external agents dislike common-property arrangements as 'inefficient' and automatically assume they are prone to over-exploitation. More commonly, however, local government changes have diluted the controls and sanctions available to a group, allowing local elites to dominate and abuse these property arrangements.

Property rights not only influence the social relations within the organisation and therefore the duties and obligations of the members, but also the relations between the irrigation organisation and the state. Failure to appreciate the significance of 'informal investments' by water users (particularly over previous generations) can cause state investment in irrigation to undermine the complex of social relations derived from hydraulic property rights (Martin

and Yoder 1986). It should be noted that property rights may extend to irrigation organisations being able to have services done for them, either by the state or by other organisations.

However, concepts of property and property rights alone do not explain organisations for collective action. As important as the concepts of property and property rights are, hydraulic property rights do not operate in isolation from other property rights and social relations of production. Regarding collective activity as solely creating property rights would appear to be far too reductionist. Communal building of a house can be seen as generating reciprocal relations between participants that can be expected to be called upon and honoured, rather than simply creating property rights between them. While there may be communal ownership of certain classes of property, this may well not be extended to other classes of property (see Clammer 1979). These themes run through the following discussion and will appear under each of the headings.

A simple uni-directional evolution is often assumed for irrigation organisations, and such experiences are visible of some Asian examples. However, many systems show the legacy of a multiplicity of externally-imposed changes on current management arrangements. These are best documented in Peru for the changes wrought by pre-Columbian, Hispanic and modern state interventions (Guillet, 1991; Lynch 1988). These represent a multiplicity of property rights that can be a source of strength or tension in local communities, depending on behaviour of different local groups. However, the range of experimentation by modern states under past nation-building activities and more recent policies of decentralisation has also left an impact on many localities, as shown by the Tanzanian case study in this volume.

In summary, we can see organisations evolving to administer and reinforce a diversity of rights to use water. External interventions have often sought to amend these rights. On the one hand, technical interventions may introduce more water, so that more people could irrigate. More commonly, however, interests control and sometimes reduce flows in the interests of catchment management, and in expanding the number of groups of users in a catchment. Under such interventions, water allocations become specified volumes, and rights to use water may conditional - for example conditions such as crop production, on political activities like groups registration. These conditions bring their own tensions to the internal dynamics of irrigation organisations, and their relations with the state.

Evolution

In talking of the evolution of irrigation organisations a useful distinction can be made between those that have their origins in traditional rural organisation, and those that have been inspired, established or partially taken over by outside forces, most notably the state. A common feature of irrigation management literature is the frequency with which existing local organisational arrangements have been overlooked. When the existence of local organisations has been acknowledged they have often been considered inadequate for managing the scale of irrigation and numbers of irrigators involved, or have been considered to be incompatible with national political principles. This has often led to the imposition of inappropriate organisational models that have been incompatible with existing social relations and world views. This in turn has led to the poor operation and maintenance of irrigation technology, with obvious adverse results. There is now a growing awareness of the need to gain some

insight into existing social patterns in order to ensure the sustainability of the organisations, the technology and the agricultural systems.

One common distinction is between 'farmer-managed', and agency managed' or 'joint-managed' irrigation systems, reflecting the variable role of agency staff in filling the roles of organisation and determining the pattern of management tasks. However, authors such as Ostrom (1993) have suggested that a better distinction might be between 'farmer-governed, 'agency governed' and jointly governed systems. This gives a better indication of who determines the rules operating in water allocation and in irrigation system membership. This paper suggests another option, between traditional and non-tradition irrigational irrigation systems.

Traditional Irrigation Organisations

These organisations have a well-established history, with a range of rules, management practices and rituals which reflect local social needs and customs. Despite the inference of much contemporary management literature, the concept of organisation is not a recent innovation. People have organised themselves as social beings in a vast range of styles and for an equally vast range of purposes, and often with a high degree of sophistication. As already discussed societies have management irrigation activities without the existence of specific management entities for irrigation. The inability of outsiders to perceive the complexity of rural social organisation has largely been the result of a search for recognisable social patterns. The desire to impose patterns more conducive to external objectives of state intervention has also played a role in the portrayal of local institutions as inadequate or non-existent.

There is a great deal of evidence of traditional irrigation management for examples from the *subaks* of Bali, the *zanjeras* of the Philippines, and the *muang faai* of Thailand. Irrigation by its very nature requires some level of group organisation. The water itself may travel across areas of land owned by various individuals and groups, and the technology required for water management often cannot be built or maintained by an individual. The degree of collective action is partly influenced by the physical environment and by the technology of the irrigation system (Siy 1990). Some irrigation systems require minimal technology and consequently very little operational management, so their collective ethos has a strong base in rules of water allocation and conflict resolution. The institutions that foster such collective activity may utilise concepts of community, kinship, religion, class or property (or any combination of the above), or they may be so embedded in the cosmology of the local society as to be almost inseparable so that irrigation is not conceptualised as a distinct social activity. The existence of collective activity in irrigation may itself become the inspiration for further collective action, and for the reinvention of the sense of community, both on a local and a national level. The *muang faai* have endured for several hundred years but only in Northern Thailand. Yet they have come to represent an important symbol for the capacity of rural peoples to organise and have now entered the national political discourse. As such, the *muang faai* have become a potent ideological symbol for various political interests wishing to manipulate notions of community and collective action (Rigg 1991, Hirsch 1989).

The *subaks* of Bali represent a traditional irrigation management system on one level, but a part of a wider complete social system that places great importance on the management of

irrigation and the cultivation of rice. They are local level associations of approximately a hundred farmers, quite distinct from the village. The *subaks* are technically specialised and the irrigation technology is cooperatively owned, even though land is held individually (Coward 1983), based in traditional Balinese law and subject to local control (Spiertz 1991). The management of water and the cultivation of rice have become central themes in Balinese cosmology and religion and the water temples and priests assumed overall responsibility for the management of the irrigation system at a supra-subak level (Lansing 1991). Not all subaks have the same history, and there are examples of recently established subaks that have drawn on the historical and cultural precedents, but have been developed by irrigators themselves (Pitana 1991).

Some of the potential effects of state agricultural policies on indigenous irrigation systems can be seen from the evidence from Indonesia. The enthusiasm with which the Indonesian state implemented a Green Revolution had a profound effect on rice production, irrigation and culture on Bali. The introduction of HYVs of rice meant that more crops could be produced and that traditional cropping practices did not need to be maintained (Spiertz 1991). Even though the traditional cropping systems have been replaced, the traditional rice and water rituals that marked the chronological order of cropping are still performed. This leads Spiertz to conclude that,

'the subak institutions have always served...as a means of contextualization of social relations on levels of rationalization other than those concerning water and crop management.' (Spiertz 1991 p.193)

Institutions and the ritual activity that they may inspire cannot be understood in a purely functional perspective. Existing 'traditional' institutions and practices can be reinvented to articulate social relations of a changing social order.

It is important to recognise the shortcomings of perceiving ritual activity as a social activity distinct from productive activities. Ritual is also a means of incorporating a range of social activities into a complete world view and social system. Certain activity is legitimised and a sense of continuity of norms and values is strengthened. For example, the *piti phi faai* ritual of Northern Thailand is performed on completion of weir repairs (Tan-kim-yong 1983). It serves the purpose of paying respect to the spirit of the weir and to the former irrigation association leaders who completed similar tasks in the past. A sense of ownership and involvement in the irrigation infrastructure and in the community is generated. It would seem that the sense of community, so widely cited as a precondition for sustainable organisations (Ostrom 1990), is in this example deeply embedded in activities that are given lasting meaning through the enactment of certain rituals. However, the political interests that are served by this reinterpretation of ritual and the means by which this reinterpretation has been 'established' are not made clear from this functional analysis of weir repair ritual.

When talking of traditional organisations it is essential to have a holistic understanding of the cultural context in which such organisations operate. In this way it is possible to build on the complex of existing norms and values and social relations, and to identify how vulnerability in a particular area of social activity can have wider ramifications.

Non-traditional Irrigation Organisations

Non-traditional irrigation management systems may exist in a number of circumstances:

- where there is no history of irrigated agriculture; or
- where the state (or other external agencies) have imposed their own organisational structure, have taken over existing organisations, or inserted their own agency staff as functionaries; or
- where rural people have developed new organisations for themselves, or have adopted other non-traditional models in response to the internal or external pressures.

Many of these non-traditional organisations may use tradition as a means to greater legitimacy, through the choice of name, or persistence of older terms. Evidence would suggest that where the state has utilised existing organisational and institutional arrangements, the management of irrigation has been more successful. Many new organisations often allow the continuation of customary rules of water allocation and customary roles for overseeing distribution of water. Standardisation of rules, regulations and representatives have often brought problems to new organisations. However the results are mixed. Not all *Dharma Tirta* of Central Java have been successful, and despite the enthusiasm for the *zanjeras* of the Philippines, they have continued to operate successfully largely by being left alone. Other examples of non-traditional irrigation organisations are grass-roots initiatives that adopt a corporate structure (eg. tubewell companies of Gujarat).

In his discussion of irrigation management in Africa, Diemer (1991) emphasises the need to build on existing irrigation organisations and institutions, and for planners to understand the objectives of local society. He details the internal organisational mechanisms of Haalpulaar villages in Senegal where there are a range of traditional local organisations that are designed to generate a sense of social cohesion, and perform functions of communal interest. These associations are deeply embedded in the cosmological and political structure of the society. Diemer regards the age-set as the basis for this process of socialisation, or, as they are perceived within the village, the 'schools' (p.13). In these age-sets children learn the essentials of collective action, particularly making and imposing decisions. The irrigation associations were managed in very much the same ways as the age-sets were managed. As Diemer writes:

'The success of the village irrigation schemes is partly due to the match between the local political system and the infrastructure, as well as the fact that valley dwellers were free to organise the management of their schemes along the lines of a model with which they were all familiar.' (Diemer 1991 p.14)

Traditional irrigation systems should not be seen as static. Their sustainability is largely the result of their adaptability. The *dharma tirta* of Central Java are recent adaptations of traditional irrigation practices, that remain flexible to local situations. Formally instituted by provincial decree in 1971, they were adaptations of the traditional *ulu-ulu* (village irrigator) system. Duewel (1985) details two *dharma tirta* that were established in response to local initiatives as conflict over water distribution during the dry season became more intense. As such they represent the capacity of local institutions to reinvent organisational principles with the support of the state administration. Recognition by the state required the adoption of formal constitution and by-laws and the establishment of leadership positions and roles

(Duewel 1985). A constant theme in building on existing organisations and institutions is the need to strike a balance between the desire for local autonomy and the practical need for legal status, and for the state to maintain some control and influence.

The very process of imposing an organisational model from the centre has been identified as the cause of organisational failure in many instances. Garforth and Munro (1992) refer to the demise of the Water Users Associations of Thailand, established by the Royal Irrigation Department (RID) in 1966. Despite initial enthusiasm they have experienced a gradual decline, no doubt precipitated by the decrease of funding. The causes of failure that Garforth and Munro list can be summarised as a general lack of responsiveness by the RID to local needs and perceptions, and failure to generate a sense of ownership among the farmers. However, when the organisational model that is imposed builds on existing patterns of indigenous cooperation, based on kinship and traditional leadership, there is evidence to suggest that it may be more successful (Garforth and Munro 1992). Coward (1983) details a case in Nepal where the state sought to extend an irrigation system to a new community. He argues that by doing so the state ignored the investments made by the communities that were the existing managers. By extending the benefits of the irrigation system to a group that had made no such investments, the state had failed to appreciate the importance of shared property (derived from shared investments) as the basis for collective action. The extension inevitably met considerable opposition.

Structures

The structural dimension to irrigation organisation focuses on the internal and external dimensions. The internal dimensions deal with the structure of the roles within the organisation and the composition of the membership. The external dimension addresses the relationship between the local organisation and the state bureaucracy.

The Internal Dimensions

The internal structure of irrigation organisations is primarily concerned with the structure of the membership. Is the membership based on residence within a particular village, or does it transcend village boundaries? Is the distribution of water according to principles of common property, or according to the land-holdings of the members? Is the membership based on kinship, religion or class? Are the members farmers irrigating their own land, or are they contracting their services as irrigators to landholders?

The village is often, but not necessarily always, the basic unit of collective action. In many situations the village is not itself an organic unit of organisation, and may well be the construction of an expanding state instituting administrative reforms in rural areas in order to extend its influence. Such observations have led Kemp (1987) to refer to the village in many parts of Thailand as a 'seductive mirage'. The bounded territorial unit of the village is a recent innovation of the Thai state, and does not reflect the historical basis for collective organisation in rural Thailand which had previously been based on kinship. Village organisations have been incorporated into the administrative structure as a means of ensuring state influence in rural areas, particularly in the context of the communist and peasant insurgency (Hirsch 1989).

However in many situations the village is indeed the basic unit of collective action. The importance of the village in irrigation management depends largely on the extent to which village boundaries fit with the boundaries of farmers' fields, and with irrigation outlets (Ralston 1977). For Hunt and Hunt (1974) the boundaries of village and farmers' fields for the Sonjo exactly coincide. Yet this is not always the case. Coward (1980a) draws a distinction between village systems and villager systems, since the most important factor is whether individuals are field neighbours rather than village neighbours. The extent to which an irrigation organisation is considered to be a village-based organisation depends largely on the history of the village as territorially bounded unit. The Pul Eliya irrigation system of Sri Lanka is based on the village irrigation tank, and members of irrigation organisations are members of the same village since the irrigation system and the fields they farm are within the same village unit (Leach 1990).

The basis of authority within the village is also of importance in order that local organisations have a sense of legitimacy. Not only may the village be a bounded territorial unit, but it may also represent a 'moral economy' (Kawagoe et al 1992). Where the outlet may not coincide with the village, there may still be great value in establishing water users organisations based upon the village if it is the village that is the basis of authority (Wade 1985). A water users organisation that contradicts village-based authority may simply not be perceived as having the degree of legitimacy that it requires in order to organise its members and fulfil its responsibilities. Authority in rural India is very much based around the village, in which the panchayat is the dominant organisation. The importance of the village in national development was emphasised by Gandhi and the village panchayats were established in the constitution and became central tools of the Community Development Programme (Robertson 1984). The village panchayats.....

'...express the Gandhian enthusiasm for the organic Indian community, whose authentic decision-making and executive capacities were supposedly stripped away by British rule, thereby eliminating internal resources and progress and development. Critics of panchayat raj, who took a more individualistic view of India's citizens and who found the premise of inequality in village life morally unattractive, could take some comfort in the fact that the new bureaucratically specified councils had their roots not in India's social past but in the minds of western-educated lawyers and civil servants.'

(Robertson 1984 p.172)

Thus the village and the panchayats were based on a reinvention of the past and incorporation of western ideals of democracy.

Irrigation has been managed around this village-based organisation with the introduction of the Irrigation Panchayat (Wade 1990). However irrigation may not be the only activity that is organised collectively within the village. Kawagoe (1992) notes that in many situations other activities are managed collectively by the village including funerals, building and repairing bridges. It is also important to appreciate to what extent these activities are manifestations of a sense of community, and to what extent they are means of generating and reinventing this sense of community. Thus if a community-based activity is taken away from the village it may have far-reaching effects in undermining the sense of cohesion and community within the village. Equally if specific activities and responsibilities are taken away

from the village as a whole, and handed on to village sub-groups, this may have a divisive effect on the village community.

Irrigation management may require more than one village to cooperate. Often the village is not the primary basis for social organisation and individuals may have ties of allegiance that transcend village boundaries. The subaks have already been mentioned as examples of such organisations (Geertz 1990). Coward (1980) describes the subak as a 'task-oriented coalition of individuals whose membership is defined by field locality' (p.209). Mahdi (1986) discusses the Berbers of Morocco who have complex patterns of social structure, being divided into extended families, lineages, villages and fractions. Individuals are members of particular villages, but also members of fractions which may comprise several villages. Villages themselves are divided into four quarters comprising two lineages. For Mahdi, Berber rural life is characterised by a high degree of tension. Despite 'established' norms of practice, the Berbers are quite willing to manipulate their allegiance to particular groups in order to maximise their water rights. This could well be interpreted as being symptomatic of a complex social structure, or of the limitations in thinking terms of 'established' norms and values without incorporating some notion of dynamism

Within village-based irrigation organisations we can distinguish between those that are based on hierarchical authority structures and those that are based on equitable group consensus. Coward (1983) regards the irrigation *panchayats* and the *muang faai* to be elite-owned systems of irrigation management. In both these societies there is a strongly hierarchical structure with patron/client networks being prevalent. The irrigation organisations merely reflect the wider social organisation.

Shah and Bhattacharya (1993) examine irrigation companies and tubewell cooperatives in Gujarat. The internal structure of these organisations is quite different, both from each other and from what one would expect of each. They conclude that the cooperatives tend to be cooperatives in name only and 'oligarchies in fact' (p 20) whereas the companies 'are strikingly similar to an idealised cooperative' (p.20). The irrigation companies are founded on the design concept of a member company. Members of companies are drawn from the command area of the proposed tubewell. All members invest money and labour for operation and maintenance, and the company is regulated by the Management Committee who hold regular meetings. The manager, who tends to be large stakeholder, is ultimately responsible for the day to day running of the irrigation system. Shah and Bhattacharya (1993) argue that the success of the company is based on the fact that all members have made a significant personal commitment to the company and that the management regime remains open. This is in stark contrast to the tubewell cooperatives. Formation of a cooperative entitles it to various subsidies. Such entitlement is often the main motivation to form a cooperative and is an effective means for large landholders to form an officially recognised organisation (and therefore one that is eligible for subsidies) that will in effect serve his own personal interests. The efficient and equitable running of the irrigation service is a secondary concern. It is interesting to note that whereas the tubewell cooperatives are officially encouraged and recognised, the companies were established on the members own initiative and their own resources. It is unclear whether there is any significant difference in the economic position of the members of the companies and of the cooperatives, even though formation of a company requires some initial capital.

Although the desire to irrigate one's own land is a powerful motivation to join an irrigation organisation, not all irrigation organisations are run by landholders themselves. Some are service organisations responsible for operation and maintenance who are subcontracted by organisations of farmers. In Ilocos Norte a distinction is made between two types of *zanjeras*: those that are comprised of farmers irrigating land that they are already cultivating, and between those that are non-farmers wishing to acquire farming land by supplying irrigation services (Siy 1990). Recent innovations in Bangladesh by local NGOs have organised groups of four or five landless peasants to provide irrigation services by operating tube wells (Wood and Palmer-Jones 1991). In this way the landless gain control of a vital agricultural resource which otherwise would have been taken over by the rural elites.

The number of people involved in irrigation organisations can also be of great importance. The logistical problems of co-ordinating large numbers of people and of reaching some degree of consensus among them should not be underestimated. In Laos there is a strong institutional tradition of collective organisation, but it is appreciated that between 70 and 80 people involved in an irrigation organisation is the maximum (Coward 1980 b I in Asia ch 15). The number of people involved in an irrigation organisation is also partly influenced by the scale of irrigation structure. There are significant institutional and logistical limitations of adopting a management model that is unable to fulfil the desired objectives of an organisation. Key organisational activities as identified by Uphoff (1986) such as monitoring, decision-making and consensus reaching become more difficult in a large scale organisation.

The External Dimension

Local level irrigation organisations may also be categorised according to their relations with the state and irrigation departments. Since Wittfogel there has been the argument that large-scale irrigation systems requires and allows a strong centralised state. This argument has been widely criticised (eg. Rigg 1991) but still has some influence on the literature that examines the relationship between water users and the state. The relations with external authorities depends in part on the level at which they operate, whether it is at the central, command area or farmer level (Freeman and Lowdermilk 1985). This in turn influences the range of activities and responsibilities that the irrigation organisation may undertake. In assessing the relationship between water users and the state Coward (1980) suggests three issues that need to be considered:

- who has responsibility for what decisions ?
- what political influence they have ?
- what resources are available ?

The influence of the local irrigation organisation is greatly influenced by the capacity it has to set its own agenda or follow that of the state. It is not only the state that makes claims on the irrigation organisation. The state has responsibilities to its constituents which it may be called upon to fulfil in times of crisis. Decentralisation of power to local irrigation organisations is often a means by which the state is able to off-load such obligations, but not necessarily to organisations and institutional structures that are capable of managing these responsibilities.

Coward (1980 b) describes four types of arrangement between the water users and the central authority: the Gezira, the Taiwanese, the Californian and the Lao solutions.

1. Gezira model-with strong control by the water authority at project and farm level and a centralized management scheme in which individual water users operate.
2. Taiwanese model- 'water users are represented at several levels of project operation through selected representatives'(p.330)
3. Californian model- 'water users form an association to purchase water wholesale from the central authority and retail it to their individual members' (p.330)
4. Lao model-adaptation and incorporation of indigenous irrigation leadership roles of already experienced irrigators.

It is difficult to assess the empirical foundation of such a neat typology. The fieldwork material from Laos all predates the Pathet Lao revolution. Very little material concerning the Gezira model has emerged during the last decade as a result of the civil war. Evidence on the degree of farmer participation and representation from Taiwan is far from conclusive.

Wade (1990) presents a two-piece model in which he contrasts the Departmental model (eg. in India) and the Irrigation Association model (eg. in South Korea). He argues that most irrigation systems fit into one or other of these two models. The main difference between the two is in the management of the canals, and the degree to which those managing the canals are responsible to the beneficiaries. In the Departmental model the canals are managed by a centralised government hierarchy with the administrative units of the Department of Irrigation being based in regional cities or towns. In this model the chiefs of operation and maintenance are near the command area, and field staff are placed in the command area. In the Irrigation Association model, the canals are managed by staff paid for and sometimes appointed by the beneficiaries, who also have responsibility for some of the capital costs. The Farmland Improvement Associations, parastatal bodies which run the larger of the small-scale systems, are distinct from the Ministry of Agriculture and take on a range of other functions including agricultural extension, land development and water charge assessment and collection. The differences in performance are not just attributable to the different organisational models. There is a greater degree of local level responsibility and accountability in the Korean case, but the canals are still poorly run. A crucial factor for Wade, is the reliability of water supply which is determined by physical and technological factors, as well as organisational factors..

In all these models a crucial variable that influences the success of the system is the authority that the local organisation has. When the central authority takes on responsibility for activities which the local organisation is capable of performing, irrigation is likely to be managed less efficiently and less responsively to local conditions and needs (Bagadion and Korten 1985). When water users are faced with an inefficient and unresponsive central authority the irrigation system may suffer, or the water users may well decide to take matters into their own hands. Van der Zaag (1992) describes 'the domestication of government property' in Mexico. The central authority was unwilling or unable to ensure maintenance of the irrigation system so that farmers were compelled to take these responsibilities upon themselves and thereby

'reaffirmed their ultimate ownership of the canal infrastructure....Formerly it had been unclear who owned the canals in this government-managed system. Now, after investing labour, organisation and money in the canal, it has

become apparent that the farmers own it and the District has lost its control over it.'

(van der Zaag 1992 pp.10-11)

The sense of ownership or participation is an important incentive for water users to manage the irrigation system. However, generating this sense of ownership is also a valuable political tool for the central authorities and is a sophisticated mechanism for ensuring greater central control through the appearance of greater decentralisation. The extent to which local control can be regarded as genuine can perhaps best be assessed by examining the range of activities over which the local organisations have control.

Functions

For Uphoff (1986) organisations should be understood 'in a functional way, not as anything rigid or abstract' (p.6). The range of functions that an irrigation organisation may undertake is partly influenced by technological features of the irrigation system itself and the physical features of the environment in which it operates. The capacity to organise collectively and the political relationship between the irrigation organisation and the central authority will also influence the range of functions that the organisation is able or willing to undertake. Collective action may be restricted by the state, or such action may be regarded as being an interference with the state's own responsibilities. Some irrigation organisations undertake other activities (eg. agricultural extension, credit supply and marketing) while in other instances the collective management of irrigation is only one feature of a more broad based local organisation.

Uphoff's organisational matrix has had a great influence on irrigation management literature. He divides activities into three categories: organisational activities, control structure activities, and water use activities. Under the category of organisational activities he includes decision making, resource mobilisation, communication and conflict management. Under the category of control structure activities he includes design, construction, operation and maintenance. By water use activities he refers to acquisition, allocation, distribution and drainage (Uphoff 1986 p.33).

The level of activity required under the categories of water use activities, and control structure activities will largely be determined by the physical and natural conditions of the irrigation system and its environment. Some irrigation systems require sophisticated technology that in turn require regular maintenance to ensure continued operation. For example, the Qanat of Iran are largely self-managing and therefore the organisations responsible for their management have few regular responsibilities.

For Uphoff all organisations will display the features placed under the heading of organisational activities as a means to deal with water user activities and control structure activities. Resource mobilisation may be the most visible activity, while other activities may not be immediately apparent. The process of making decisions and resolving conflict cannot be expected to operate according to universally recognisable principles, but nonetheless may operate according to complex socio-cultural principles. The constant reinvention of the sense of legitimacy of the local organisation is an essential feature of any sustainable organisation. How this is achieved is partly influenced by the performance of the more visible tasks, and partly by the utilisation of cultural and ideological symbols.

Irrigation is just one of a range of agricultural activities. The successful management of irrigation is not an end in itself. That irrigation should be identified as a separate agricultural activity itself requiring distinct activities, is in many ways symptomatic of the process of rationalisation of development administration. It is often in the interests of distinct line ministries, such as the Department of Irrigation, to maintain irrigation activities as clearly defined and separate from other activities (eg. extension or credit) which may be the responsibility of other government departments. The poor coordination between line ministries with overlapping areas of responsibility in Thailand is attributed to way in which ministries have become the basis of 'empire building' for influential patrons within the ministries (Rigg 1991). These clearly defined boundaries of responsibility may be of little relevance to water users who see irrigation as one feature of their agricultural activity, but who also require other activities (eg extension, input supply and credit).

Rural organisations may regard a range of activities as being inseparable from irrigation. Such other activities may include income generation, marketing, livestock, extension and credit supply. The success of irrigation cannot solely be assessed in terms of crop output if the value of that crop deteriorates. The impact of successful irrigation management may be eroded by market failure or poor transport links to the market. These other functions may well be appropriate for irrigation organisations. Siy (1990) notes that *zanjeras* that have attained a surplus in terms of members' contributions do take on marketing and credit activities. It is not clear whether they take on these other functions as a result of their success in managing irrigation, or whether it is due to the realisation of the limitations of single-function activity. Perhaps those *zanjeras* that generate a financial surplus are more capable of managing a range of activities. While rural organisations may wish to take on a wider range of activities there is a need to strike a balance between a large number of single-interest organisations and the existence of overstretched organisations unable to fulfil any of their responsibilities adequately (Raby 1991). Theories of collective action (eg. Olson 1965) argue that when cooperation is limited in objectives, functions and has only one category of participant, it is more likely to meet its objectives than when it is based on multi-purpose community cooperation (see also Greeley 1980). {It should be noted that an organisation with one clearly defined goal is by definition more likely to meet its objectives than one with several inter-connected objectives.}

There is also the need to consider under what conditions and for what purposes, people are willing to cooperate. These conditions will vary according to the socio-cultural context, and the extent to which collective activity is institutionalised. In his analysis of common property resource management in South India, Wade (1985) concludes that villagers are willing to cooperate 'only to achieve intensely felt needs that could not be met by individual responses' (p.248). He regards the defence of production as being attributed the highest priority for collective action, closely followed by the 'enhancement of income'. Activities pertaining to health, education, nutrition and civic consciousness are given far less importance as motives for collective action. If these conclusions were applied to irrigation management in general, we might expect that activities that had a more immediate and visible impact would be more readily engaged in. There are perhaps lessons to be drawn concerning how and in what circumstances multi-function organisations can be established.

Roles, Rules, Rights and Responsibilities

In this section the institutional and organisational factors will be brought together to consider the rules and the roles with which irrigation organisations operate. Issues of what offices exist within organisations, and what their responsibilities are, will be tackled. A fundamental issue in irrigation management is how water is distributed and what responsibilities members of organisations have. As with other issues in irrigation organisations, these themes are related to the type of irrigation system, and in particular, the quality and reliability of water supply (Wade 1990). The importance of irrigation as a vital resource and consequently a highly politicised resource is not always recognised. In recommending more detailed ethnographic information Hunt and Hunt (1974) remark that irrigation is 'a resource of great structural potential; it is systematically linked with major features of the social organisation, closely linked with differential power, and embedded in the local-national linkages of states'. (p.398). The following discussion will attempt to address some of these issues.

Roles

The internal stratification of irrigation organisations is influenced by the size and reliability of the irrigation system, and the membership of the organisation. Irrigation systems that require regular maintenance and regular resource mobilisation require a greater range of tasks and a clearer division of labour. Those systems that are more or less self-regulating in the day to day running will require less internal stratification, but perhaps more clearly defined mechanisms for resource mobilisation for less regular operation and maintenance activities. Depending on whether the organisational model is based on traditional institutions for collective action or whether they are recent innovations or are imposed, the offices within the organisation will be based on established divisions of labour and bases of authority, and individual responsibilities will be more clearly defined and understood.

There is a trend within the literature on organisations for irrigation management to impose a universally applicable management model that seems to be based on a specific Western model, with the key positions of president, treasurer and secretary, and regular meetings. It should not be assumed that such models would be appropriate in all situations. An irrigation organisation that requires minimal maintenance activity, will also require minimal financial input from the members, and therefore will not require a treasurer. When the water distribution and labour mobilisation rules are complex, there may well be a need for an office holder to manage and record these responsibilities.

With more established bureaucratic structures there is a real need for local organisations to be able to deal with state administration, and to do so within established structures. Irrigation organisations that wish to negotiate competently with the irrigation administration need to be able to do so on the terms of the irrigation department. Such organisations need to be conversant with national institutional (ie. rules, norms and values) procedures. An official may need to act as an intermediary between the irrigation organisation and the government irrigation department (van der Zaag 1992, Ostrom 1993). The broader the range of functions that the organisation undertakes, the more it must be capable of dealing with the state and market, as well as its internal responsibilities.

Officials that take on such responsibilities are inevitably drawn into a highly politicised relationship. Although the motivation for taking on positions of responsibility must be acknowledged as being highly varied, it must also be acknowledged that in some circumstances

'the incentive for a person to assume executive responsibility for a local irrigation system lies in the possibility of differential control of the deployable surpluses of the system.' (Hunt and Hunt 1974 p.397)

An incentive for the state is to have recognised structures and procedures, and a mechanism to ensure compliance with state policy.

The accountability of the leadership of irrigation organisations is an important factor influencing the performance and sustainability of irrigation organisations. Water is an essential (and often scarce) agricultural resource, control over which has much wider political and economic implications. In some instances the leadership is imposed on the organisation by the Irrigation Department. Such a leader can become a source of state patronage that enables the state to maintain its influence over the irrigation organisation. As Hunt and Hunt (1974) write of the Pul Eliya in Sri Lanka:

'the irrigation headman is the bottom rung of a long ladder of government offices and local elite roles, and he is integrated into the state power structure' (p.396).

Not only is the management of the water resource an issue. The capacity of rural people to organise themselves collectively has political implications and can be regarded as a threat to the state and rural elites upon whom the state depends. Efficiency of irrigation operation and management is not necessarily the only agenda.

Even when the material rewards of leadership appear to be minimal there may also be unofficial sources of material advancement, and/or compensation in non-material forms. The status associated with leadership of irrigation organisations can in itself be highly valued, or can allow the office holder enhanced access to other forms of compensation and influence. As Leach (1980) writes of the Vel Vidane (Irrigation Headman) in Sri Lanka, he is theoretically elected by villagers, but

'... once elected can hold office for many years, until he either resigns or is dismissed for malpractice. It is an office which entails a large amount of tedious clerical work, for which the direct rewards are small, but in a prosperous village the indirect advantages which accrue to the Vel Vidane through his position of influence can be very great.' (p.94-95)

In Pul Eliya water is such a vital resource that the office of Vel Vidane has political and economic influence throughout the community. Excessive cynicism should not allow us to dismiss altruism as the motivation for taking on responsibility for collective organisation.

The accountability of the organisation's leadership cannot be determined solely on the basis of the official title of the organisation. Shah and Battacharya (1993) observed that Gujarati

irrigation companies operated in a more cooperative manner than the state sponsored irrigation cooperatives. They conclude that the financial contribution of members in the companies to provide an income for the company leadership is a powerful mechanism for regulating their activities and ensuring accountability. This is an important observation. The regulating influences of a 'moral economy' will not apply in all socio-cultural situations and can become severely strained in periods of rapid economic and political change. The financial accountability to organisation members may well be an effective mechanism to prevent local elites dominating irrigation organisations. Financial involvement in the company is also a strong incentive for members to fulfil their obligations and to ensure that their initial investment is made more worthwhile.

A common feature of many irrigation organisations is the office of the outlet controller, in whom a great deal of influence and authority is based. It is a position that may allow access to bribes or that may be open to threats of violence or coercion (Wade 1985, Van der Zaag 1992). The authority of the outlet controller is in turn influenced by the sense of legitimacy he holds with the organisation membership, but also depends upon the reliability of the water flow and the control he has over that flow. The relationship between the field level outlet controller and higher state authority is also an important factor in the running of the local organisation. An Irrigation Department that is unresponsive to the needs of farmers as expressed through the office of the outlet controller may well lose credibility with the field level organisation, as has already been documented in the cases in Mexico (see references to van der Zaag 1992).

The outlet controller is not necessarily the dominant office within the irrigation organisation. Depending on the level of collective organisation that is required, the level of members' financial contributions and the frequency of organisation meetings, offices equivalent to those of 'president', 'treasurer' and 'secretary' may be established. The irrigation organisations of Nepal (see Martin and Yoder [1986]) elect a leader (*mukhiya*) and a secretary. The *mukhiya* is responsible for organising and supervising work, and the secretary is responsible for the organisation's accounts, recording members' water allocation and attendance at work, and for keeping the minutes of the organisation's meetings.

There are examples of state and NGO initiatives that attempt to bridge the organisational gap between the field organisation and the bureaucracy. The 'social organiser' (also known as 'community organiser', 'institution organiser', 'community organiser') was a role that was introduced in many parts of South East Asia (Manor et al 1990, Bruns and Atmanto 1992). Responsibilities differed in each country but generally were considered to be to act as a catalyst in the establishment of irrigation organisations, to increase resource mobilisation and to increase agricultural output (Pradhan and Sharples 1990).

Rights and Responsibilities

The key rights and responsibilities of an irrigation system refer to the distribution of water, and the types and amounts of resources that members of the organisation are required to supply (Ostrom 1993). The system for the distribution of water usually follows one of the following outlines:

1. Fixed Percentage
 - a) according to land holdings
 - b) according to household size
 - c) according to shares held by members (which may or may not be transferable.)
 - d) according to members inputs
 2. Fixed Time Slots
 3. Fixed Orders
 - a) according to individuals/communities who may have primary rights
- (Adapted from Ostrom 1993)

Ostrom (1993) concludes from her survey of 47 irrigation organisations that water distribution according to fixed time slots is the most common. She suggests that this may be because this method requires the least complex calculations. However it may not be appropriate in all physical and social settings, particularly when the water supply is erratic. In periods of water scarcity there may well be a mechanism to alter the system of water distribution and rates of allocation across the year, or at times of duress such as drought (Cormick, 1983; Downing, 1974).

Property rights are regarded by Coward (1983) to be the crucial factor in the distribution of water. We then need to consider how new property rights fit with existing property rights and what kind of impact these new property relations will have on existing property and power relations. As with the introduction of any new resource, the establishment of an irrigation organisation is not necessarily an empowering process for those who benefit least from existing property relations. The nature of shares is particularly variable, and external interventions have sometimes failed to understand their implications when new water supplies are mobilised. Martin and Yoder document different rules in two neighbouring systems in Nepal. Only where new water shares could be created and purchased were technical changes able to benefit a larger number of irrigators.

For Coward, 'allocation of water is a function of rules of land allocation'. Land allocation itself may be highly complex, as in Sri Lanka (Leach 1980, Spiertz 1991). Indeed land and water rights may not always be inseparable. Hunt and Hunt (1974) compared the situations in Syria and Yemen. In Syria where irrigation is based on large rivers, water rights and land rights were inseparable. In times of scarcity, reductions in water allocation were proportional to land rights. Examples from oases in Yemen showed very different practice, with water rights based on a fixed time quota, and can be sold or transferred. In times of scarcity individuals or communities have primary rights of access to water. However, it should be noted that this analysis does not take into consideration the considerable diversity between systems in both countries. While remaining sceptical of the accuracy of such a sweeping analysis the implications that rights to water mirror those to land should be noted.

Rights to water are not necessarily fixed and in some situations can be transferred. Martin and Yoder (1986) detail how in Nepal, only those who have invested their labour or money in the irrigation system have rights of access to the water that the system distributes. Water rights are determined on a household level, and it is possible for some households to acquire rights to more water than they require. They are then able to sell their shares but even though the price is nominally fixed by the organisation management committee, the market price is far higher (Martin and Yoder 1986). It would appear that such a system of water distribution

allows large landholders to gain a surplus in water rights and further enhance their economic and political position by selling these rights.

The significance of property rights has already been mentioned (see Coward 1983). Yet there is also a policy issue of generating a 'sense of ownership' which may or may not reflect legal rights, and the authority that organisations have to make decisions about the irrigation system. The sense of ownership in a common property resource is considered to be a necessary condition for the resource's sustainable management (Ostrom 1990). It acts as an incentive to invest in the resource's upkeep and to do so even if the benefits will only accrue to future generations. As with the sense of participation in development projects, it is also a mechanism for mobilising local resources, whether or not the ownership can be considered to be genuine.

When considering the decentralisation of irrigation systems the state needs to balance the desire to maintain some control over the system, and the desire not to be held responsible for the system's operation and maintenance (Bruns and Atmanto 1992). Turn-over of irrigation systems to local irrigation organisations can kill two birds with one stone; it can ensure sustainable management of the irrigation system, with lessened financial and administrative responsibility.

Summary

The analysis of the variety of organisation types relies upon more than an idealised understanding of organisations according to their titles. The origins, functions and structures of organisations will also influence their capacity and sustainability. Irrigation is one of many interlinked activities that are central to rural livelihoods. Separation of irrigation activities from other rural activities may have practical value in establishing functional organisations, but when taken too far can limit our understanding of how people organise collectively to protect their livelihoods.

Conclusion

The preceding discussion has highlighted the great diversity in irrigation organisations, not only in terms of the titles of these organisations, but also in terms of their origins, structure, functions and the roles and responsibilities they establish. Even though it may not be possible to compare organisations with the same title, the connotations of particular titles, and of organisations that adopt titles with particularly strong connotations are still worthy of consideration.

The diversity in organisation types is not directly influenced by the type of irrigation in which they are involved. Different irrigation technology may require different organisational activities, but the way in which those functions are organised cannot be easily predicted. Within the same locality, with similar physical features, there is evidence of a range of organisation types. Clearly there are cultural variables that are of significance and which are worthy of more detailed analysis.

The functional-type analysis of irrigation organisations may not give a complete picture. Organisations may have different objectives some of which may be more explicit and functionally oriented than others. It is very difficult to assess the sense of solidarity or group

cohesion that is generated through collective activity. A more detailed analysis is required if the conditions for successful scaling-up of irrigation organisations is to be understood.

The design concept of organisations may only be universally applicable in the broadest of terms eg. the extent to which the organisation is in response to perceived local need, the extent to which it is founded on established norms and values. The emphasis on existing institutions does not seem to take into consideration the impact of social and economic change which is after all a key feature of developing countries, particularly those that are going through structural adjustment-type policies and disengagement of the state. This is particularly relevant because it requires local organisations to make an institutional change to accommodate wider political and institutional changes. There is still a lack of evidence concerning what people do in these circumstances.

The learning process approach emphasises the necessity for local organisations to have the institutional capacity to adapt. There is still some confusion between the bureaucratic ideal and the political reality (Robertson 1984). There is rarely any mention of issues of power, and how distribution of vital resources (such as irrigation water) influences social differentiation. It seems to be inferred that if appropriate institutions are established within the 'learning process approach' framework, issues of elite domination and inequality will be overcome for once and for all. It is also unclear how norms and values can be adapted and how people can change their sense of affiliation, for example from ethnicity to class. The emphasis on notions of 'community' as the basis for irrigation organisation tend to emphasise a sense of homogeneity which obscures analysis of internal social differentiation. While the concept of 'community' may operate as a (potentially) potent ideological mechanism for collective action, it is an ideological concept that remains open to reinterpretation and reinvention.

In order to understand the sustainability of irrigation organisations and their vulnerability and capacity to take on other functions, it is necessary to place organisations in a fuller socio-political context. Organisations and institutions themselves operate as resources that allow people to act collectively and to deal with complex external structures (eg. the state, the market and NGOs). However, there are a range of other resources that influence and are influenced by organisational/institutional capacity, particularly material, economic, human, natural and cultural resources. None of these sets of resources operates in isolation from the other. Vulnerability in one may well lead to vulnerability in another. Thus poor performance of the material resources of irrigation systems and changing market conditions are likely to have ramifications for organisational performance. The collapse of some irrigation organisations cannot solely be explained in terms of institutional weakness if the material resources necessary for irrigation are unavailable, or if changing economic conditions increase indebtedness or rural migration.

The relationship between local level irrigation organisations and the development administration has been shown to be of great importance. This is not simply a managerial relationship. It is too often analysed in a depoliticised manner that minimises the central issues of power and production and state/civil society relations. This is an increasingly serious oversight given the rapid political changes that are occurring in developing countries, and the range of organisations (particularly non-governmental organisations) that are becoming involved in development policy and practice. Although there may be practical requirements

for toning the political analysis, failure to appreciate the political dimensions of local level organisation (such as irrigation organisations) may well have far-reaching implications.

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IRRIGATION ORGANISATIONS IN THAILAND

Richard Friend

Irrigation has special significance in the current debate concerning rural peoples organisations (RPOs) in Thailand. There is a plethora of rural organisations in Thailand, most of which are single function organisations established through the efforts of particular government ministries and departments within ministries. However, the support from the local people which these organisations enjoy has been limited, and those organisations that have been established have very often collapsed or performed less well than was expected. Despite this record of poor performance there is an established history of indigenous irrigation organisations in the North of Thailand, the *muang faai*, that have become an important ideological symbol of the capacity of rural people to organise themselves and manage their natural resources in an equitable and sustainable manner. Although irrigation organisations are not the most prevalent in the kingdom, they continue to have an impact on the general debate concerning rural organisations.

The discussion of rural peoples organisations has tended to limit itself to the discourse of public administration and management. Despite the almost universal rhetorical commitment to the importance of strengthening or establishing rural organisations, the interpretation of what these organisations should be, what they should do and whose interests they serve inevitably raises uncomfortable political issues of power and production. In examining rural peoples organisations in Thailand, the discourse of public administration will get us only so far. At some stage a more political economy type analysis is required.

Development policy is not a neutral managerial technique. Policy seeks to impose change, through ideas, institutions, organisations and technology, and inevitably affects relations of production and power. The growing emphasis on organisations and institutions is a reflection of a particular approach to collective action; one that is deeply embedded in notions of bureaucracy. Indeed Robertson (1984) argues,

'Community and bureaucracy are evidently two antithetical styles of social organisation which serve to distinguish the two major protagonists in planned development; the people and the state.' (p.150)

Bureaucratisation of social organisation is a process of specific political and organisational interest gaining influence of the state apparatus, penetrating all areas of social organisation.

The discussion of rural organisations must address issues of the relationship between the state and civil society, urban/rural relations, and issues of local and national 'community'. These issues are now entering the national political discourse in Thailand. The conflicting interpretations of the direction of national and local development have become even more significant with the marginalisation of large sections of the rural population, and devastation of the natural resource base, as Thailand has pursued a largely export-oriented, urban-biased course of development. These issues are increasingly being addressed by the state, by NGOs and by rural peoples themselves. It is in this context that the village in Thailand is becoming an arena of contested space (Hirsch 1989). Widely referred to as the essence of Thainess, the

state, NGOs and rural people compete amongst each other for the soul of the village. The discussion of rural organisations is caught up in this conflict, or what Robertson (1984) refers to as a conflict between two antithetical modes of organisation, bureaucracy and community, the former belonging to the state and the latter to the people.

Power in the Thai nation historically has been based in the urban centre and has spread out to the rural areas (Hirsch 1989). The village is argued to have become the client of the city. The Thai administration maintains the clientist position of the village by steering any village level participation into a subordinate role. Decisions are made in the centre only allowing the village flexibility within the existing social and political framework. As Gohlert argues:

'the relationship between the rural and urban spheres from the perspective of the villagers, continues to be characterized by the principle of patrimonial obligation, ie. as long as the village meets its formal obligations to the urban authorities, they should be able to pursue their own affairs relatively undisturbed.' (1991 p.79)

Yet the obligations of the village are themselves tightly controlled within the administrative system that perpetuates the state's presence in and control of the village.

Rural Organisations in Thailand

There has been a remarkable growth in the number of rural organisations in Thailand in recent years. Presented within the broad framework of a 'bottom up' strategy that encourages participation and decentralisation, the policy of promoting rural organisations that operate through existing administrative structures (developed in the tambon administrative reforms) the state has increasingly bureaucratized the village (Hewison 1993). In so doing, it has established and legitimised particular courses of action and types of organisation, to which all must comply.

The National Economic and Social Development Board (NESDB) is the state body responsible for five year national development plans. Both the Fifth and Sixth Plans made a rhetorical commitment to the participation of rural peoples through rural organisations working within the tambon administrative structure as a strategy to address the social, economic and environmental problems of rural people. However, as Hewison argues,

'The NESDB has so bureaucratized the 'bottom up' process that the decision-making tree sets out a minimum of twenty steps from the village to the cabinet and back, a process taking at least 18 months. At the lowest levels this now involves a whole range of groups at the subdistrict, village and subvillage level...The state's 'bottom up' or grassroots development process is no such thing, and is never really intended to be other than top down.' (1993 p.1702)

A vast array of organisations that are supposedly serving the interests of rural people can now be found in rural Thailand. Examples of such organisations are as follows:

- farmers groups
- credit groups
- housewives groups

- young farmers (4H)
- water users groups
- cooperatives
- rice/buffalo banks
- seed/fertilizer
- livestock
- orchard
- fishery
- cattle
- poultry
- pigs

(see Garforth and Munro 1990)

There may be several single-function organisations operating within the same area. Membership of organisations often overlaps (reflecting the economic activity of villagers), but in order to obtain the benefits one must be a member of each specific organisation. Villagers are often unfamiliar with such a system of organisation, and unaware of the need to be active members of organisations in order to receive specific rights and benefits. Each organisation must maintain its own independent structure and agenda in order to gain formal recognition and support from the relevant government department (Garforth and Munro 1990). Each government sponsored group is established by a particular department or ministry. The main ministry responsible for setting up local organisations is the Ministry of Agriculture and Cooperatives (MOAC). Within the MOAC are a number of particular departments eg. the Royal Irrigation Department (RID), the Department of Cooperative Promotion, and the Department of Agricultural Extension and the Royal Forestry Department. The Ministry of the Interior (MOI) is also involved in rural development through the Community Development Department, and all rural organisations must register with the MOI. The Bank of Agriculture and Agricultural Cooperatives is actively involved in rural development and the establishment of rural organisations, particularly credit, input and supply organisations. With such a wide range of state departments involved in establishing rural organisations, it can be seen that,

'the distribution of cooperative activity in any one area only reflects the strength of the programme of each particular ministry in that area.'

(Demaine 1976 p.9)

The poor performance of rural organisations has often been attributed to the poor coordination between ministries and departments within ministries (NESDB 1987). While managerial and administrative reforms are advocated as possible solutions, the conflict of interests between government departments may have more fundamental explanations to do with the structure of authority within Thai society and bureaucracy, and the political self interest of particular departments and ministries. The Thai bureaucracy has enjoyed a privileged position of power and influence within the Thai state since the 1932 constitutional revolution. Riggs (1966) referred to the Thai state as a 'bureaucratic polity' to describe the dominant role that the bureaucracy enjoyed. Despite the growing influence within the state of the military and business interests, the bureaucracy has maintained its position of influence. Yet it remains a position that is under threat. The Thai state is comprised of an uneasy alliance, more often than not characterised by internal conflict and competition between the bureaucracy, the military and business interests, and permutations thereof.

Patronage networks are a feature of many societies but are argued to have particular significance as impediments to participatory and grassroots development in Thai society (Rigg 1991). Government departments are often run as 'empires' of dominant bureaucrats operating in a hierarchical structure of patron/client relations. Departments defend their own interests and are in competition with other departments and ministries. The case often arises where several departments and ministries are operating according to incompatible or overlapping strategies within the same area. Rigg (1991) argues that innovation within the bureaucracy is also stifled by patronage networks. The rise of a junior bureaucrat is also dependent upon the patronage of a more senior bureaucrat, who himself owes his position to his superior. Entourages or '*klums*' develop within the bureaucracy perpetually competing with other *klums* for resources and influence.

The rural development administration based around the tambon reforms (see Appendix A) has been seen to be a mechanism that also guarantees state penetration of often troublesome rural areas (Hirsch 1989). The administrative structure of the tambon reforms places great power and influence in the hands of the *kamnan* (tambon leader) and the *phu yai baan* (village leader). Their own authority is dependent on the support of the state and local elites, and they have been widely referred to as being 'the eyes and the ears of the state' (see Turton 1987, Hirsch 1989).

In order to understand why state initiatives at developing rural peoples organisations have had such limited success it is essential to consider the relationship between the state administration and their rural constituents. Despite the current rhetorical commitment to participation and decentralisation (eg. as expressed by the NESDB 1987) this has received much criticism for being a mechanism to ensure state penetration of the village. There is a long and violent history of state suppression or cooptation of local organisational initiatives (eg the Farmers Federation of Thailand). Current official registration procedures are argued to be a more sophisticated extension of this historical trend (Garforth and Munro 1990).

There is also a history of traditional and grassroots organisations in Thailand. The *muang faai* irrigation organisations of northern Thailand will be discussed as examples of traditional organisations in a separate section later. The history of more contemporary grassroots organisations is dominated by the Peasant Federation of Thailand (PFT). Between 1973 and 1976 it gained widespread rural support and forced the state and rural elites to take notice of peasant grievances (Grace 1983, Turton 1987). The end of the democracy period also marked the violent end of the PFT. Many leading activists were murdered, fears of communist agitation against the Thai nation were manipulated and the PFT crumbled. Yet its legacy remains as a potent reminder of the potential of rural people to organise themselves according to their own terms. The involvement of students and NGO workers in the PFT has also left a lasting impression on the contemporary Thai NGO movement. More recently there have been well organised campaigns by rural people to protest the building of large scale dams (viz. the Nam Choam dam), illegal logging and eviction from lands that had been squatted.

For the Thai state, involvement in promoting rural organisations is balanced by the realisation of the political threat that autonomous rural organisations may pose. Experience of the PFT era has taught the state elites the efficacy of more sophisticated co-option of grassroots organisations through the manipulation of concepts of participation and decentralisation.

The Poor Performance of Rural Organisations

The poor performance of rural organisations other than credit organisations, has in general been a key feature of Thai rural development. As mentioned earlier the NESDB sees the organisational and management problems of Thai development as lying at the root of wider administrative problems. There have been a wide range of explanations offered, summarised under the following headings:

- reluctance of rural people to cooperate,
 - because of cultural inclinations to self-interest
 - reluctance to cooperate with/mistrust of the state
 - uncertain rewards
- poor administration of development bureaucracy, because of
 - poor coordination
 - lack of legitimacy with rural constituents
 - development perceived to be a form of state cooptation
 - internal political conflict
- organisational problems;
 - given too many functions, not enough support
 - lack of local leadership
 - inability to provide desired benefits

Various combinations of these explanations have persisted. The cultural explanations which present Thai farmers as being too self-interested to cooperate for the collective good have endured and inspired diverse responses. The apparent reluctance of rural peoples to cooperate required the state to take the initiative in imposing development, coopting local leadership and labour. However, the state and its development initiatives often had very little legitimacy in rural Thailand. An ideological campaign to generate a sense of community was waged that was based on notions of security and the threat of communism, but was widely perceived to be a mechanism that ensured state penetration of the countryside with uncertain rewards for the rural population (Turton 1987). Vandergeest (1991) argues that development from the state was presented as a 'gift' that in effect claimed that villagers were obligated to the officials...and kept the projects at the discretion of the officials' (p.433). A paternalistic relationship was established, in which development was a reward from a benevolent state to rural people that were prepared to comply with state policy, rather than a right which the state is obligated to fulfill. As Robertson (1984) has argued, development planning both required and evoked a sense of national community. In Thailand, the development process cannot be analysed in isolation of the process of nation building, and the interest groups that struggled to gain political control of the emerging nation. Development in Thailand has had very unequal effects, largely serving the interests of state elites and urban centres.

This general trend has not gone unchallenged. A counter narrative of development has evolved that emphasises the capacity of rural peoples to organise, and to manage their local resources in sustainable manner. The deterioration of the natural environment and of rural communities is argued to be the result of a particular style of development. It is a narrative that has been widely absorbed into the 'community culture' school of Thai NGOs that argues for a return

to cultural roots (Phongphit 1989, Gohlert 1991, Hewison 1993), rejecting export-oriented industrialised growth in favour of small-scale environmentally and culturally sustainable development, and the self-reliance of rural communities. It is within this community culture school of development that the *muang faai* have been adopted as an ideological symbol of rural peoples capacity to organise and manage natural resources in a sustainable manner.

There are also more obviously managerial explanations for the poor performance of rural organisations. Organising people for collective action is a complex and difficult process that must address issues of individual psychology and personal relations as well as more overtly political issues of production and power. Creating rural organisations within the frameworks that state development initiatives have established requires the ability to utilise very particular styles of management. The need to utilise existing institutions has been widely espoused (see Ostrom 1990, Coward 1985) and to incorporate key functions within the organisational design. There remains the perennial problem of balancing the range of functions of a particular organisation. While rural livelihoods depend on a number of interconnected activities, there is a practical managerial problem in an organisation taking on too many functions so that it is unable to perform any adequately. This is counter balanced by the need to integrate as many interrelated functions as possible. Of course organisations grow and develop (as well as decline and die) and depending on their stage of life and levels of experience (as well as their political, institutional and financial viability) are more capable of performing a varying range of functions.

An analysis of the performance and potential of rural organisations needs to incorporate all these issues. When managerial ('practical') issues are being discussed, one should not lose sight of the more fundamental political issues that are often not very far beneath the surface. The management of rural livelihoods and natural resources in Thailand is increasingly being brought into a wider political debate.

Irrigation Organisations in Thailand

Irrigation has an established history in Thailand. It has been practised extensively in the northern region for at least the last seven hundred years, and the first large scale irrigation project dates back to the 1890s (Riezebos 1989). However, there are regional differences in the extent to which irrigation is practised and organised largely due to the geography, topography and rainfall.

The climate is tropical and monsoonal, with high humidity but seasonal and regional variation in rainfall. The southwest monsoon affects the central, northern and northeastern regions but the amount of rainfall also depends on the affects of mountains. The rainfall in the south is 2000mm, and 1200mm in the other three regions (Riezebos 1989). The amount and distribution of rainfall also greatly influences the cultivation of rice, which is generally limited to the wet season.

State initiatives in irrigation have resulted in 872 large and medium scale dams being built, irrigating an area of 20 million rai (13 % of total agricultural land area). Exact figures for dry season irrigation are unavailable but can be expected to be considerably lower. For example, in the 1980s 6% of total agricultural land was irrigated in the wet season, but only 1.5% was irrigated in the dry season.

The Royal Irrigation Department, established in 1902, operates as a department within the Ministry of Agriculture and Cooperatives (MOAC). It is the main government department responsible for irrigation and receives 60% of the total MOAC budget (Prasert Kanoksing 1981). The ratio of RID expenditure on its three main categories of activity for 1991 was as follows:

supporting services	:	operation and maintenance	:	construction
27	:	26	:	45

Despite the implications of this breakdown of RID expenditure, issues of irrigation management are being assigned greater importance. Since the late 1970s there has also been a shift towards more small-scale irrigation projects (SSIP).

Irrigation is not only used for agriculture, but also for power generation, industry, metropolitan and household use. Consequently there are competing political interests involved in water management issues and often there are different government departments competing with each other over water resources.

Several other departments also take on irrigation responsibilities, often as part of integrated development projects. Competition for water resources for purposes other than irrigation brings the RID into contact with other agencies, particularly the Electricity Generating Authority of Thailand (EGAT). Thirty nine large-scale dams generate 11% of total energy produced (Santasombat 1992). Water has been diverted from irrigation projects to such diverse projects as tourist resort and golf course development (Lohmann 1990) and often for urban needs. Indeed, in 1992 farmers were informed by the chief of the Bangkok Metropolitan Water Authority that they would have to refrain from planting the second rice crop that they had previously been exhorted to cultivate in order to ensure that the city received an adequate water supply (Lohmann 1993).

Irrigation has been an integral component of a national strategy of export oriented growth and the commercialisation of agriculture (Santasombat 1992). As well as adverse impacts on the environment and agriculture, a key feature of state initiated irrigation projects has been their poor management performance. This has led to a shift of emphasis towards small-scale irrigation, that will be jointly or farmer managed. As the NESDB itself acknowledges,

'the utilization of irrigated land continues to be limited because of inefficient management, while the development of small-scale water resources has yet to reach all target areas even though large-scale water resources have nearly all been developed. The development of rural water resources in the Sixth Plan period will therefore concentrate on improving water utilization and developing small-scale water resources in all potential areas.' (1987 p.350)

The issue of farmer participation in the management of irrigation projects has been identified as being essential to successful irrigation management (Coward 1985). The history of irrigation management performance on state projects in Thailand is particularly poor. As Kanoksing notes,

'farmers' organisations which were established for on-farm water management and system operation and maintenance are generally not functioning effectively due to their poor participation. In some cases, they are not well organised and operated causing their organisation to be dissolved later. The lack of proper understanding on the efficient use of irrigation water and the negative collaboration among members are major problems that need to be resolved.'

(1991 p.296)

In attempting to resolve these problems a number of different management projects and organisational designs have been implemented. There has been a growing recognition of the role that participatory farmers' organisations can play, and of the lessons that can be learnt from long established management systems such as the *muang faai*. State initiatives will be discussed later, but first the history and performance of the *muang faai* will be considered.

The Muang Faai

The *muang faai* of Northern Thailand are widely referred to (but not so well documented) communal irrigation systems that have been in existence for over seven hundred years. Historical evidence suggests that they date back to the time of the thirteenth century and the reign of King Mengrai, the ruler of the Chiang Mai kingdom of Lannathai. It is argued that many of the regulations established in 'The Laws of King Menrai' (written in 1292) are 'apt descriptions of the irrigation works as they exist today' (Unknown p.81). *muang faai* are found throughout the northern region, both in lowland and upland areas (Tan-kim-yong 1983). They range in size from systems operated by a few families irrigating one and a half hectares, to others that include twenty-five communities and several hundred members, irrigating 800-1600 hectares (Tongdeleert and Lohmann 1991). In the 1980s there were an estimated 2000 *muang faai* irrigating 96 000 hectares in Chiang Mai province, compared with the four government built dams irrigating 52 000 hectares (Tongdeleert and Lohmann 1991, Tan-kim-yong 1983)

The recent history of the *muang faai* has been more troubled due to the combined effects of rapid social and economic change, population movements, intensified usage and conflict over natural resources, and tension between the state authorities and the established communities of the North. More recently, as national political discourse makes constant reference to rural Thailand as the backbone of the nation, they have become an important ideological symbol of the potential for rural people to organise themselves and to manage natural resources in a sustainable manner. This discourse has not been the monopoly of any particular political group as the notion of 'community' becomes an integral component of all factions' interpretations of development, including the state, NGOs and opposition political parties. The mixed results of state-sponsored irrigation schemes (particularly the poor maintenance record and the unsustainability of the technology) has renewed interest in traditional based irrigation systems. However, the way in which they have been written about has very often reflected various ideological concerns.

The *muang faai* is often presented as being more than an irrigation management system (Chatchawan and Lohmann 1991). Based upon a sophisticated, locally-specific knowledge of agriculture and the natural environment, the *muang faai* both generates and relies upon a sense of community. Collective action and roles and duties are institutionalised in a world view

that incorporates natural, human and spiritual phenomena, reinforced through the performance of ritual. The annual maintenance activities re-establish a sense of continuity with collective activities of previous generations and with the spirits of nature. However, there is little evidence of the collective action of *muang faai* irrigation systems being extended to other activities, except recent isolated campaigns to protect the local environment and local livelihoods (Lohmann 1991). The durability of *muang faai* is presented as testimony to the willingness of rural Thai people to act collectively for a specific function that is perceived to be of local importance. This is in contrast to state and some NGO attempts to organise people according to role (eg. the Housewives Groups, Young Farmers Groups).

Muang Faai Administration

There is no universally applied management model among *muang faai*, although some features are more or less constant. Since the size of *muang faai* membership, the scope of irrigation it controls and the geographical setting in which they operate may all differ, it is perhaps not surprising that there are some differences in management styles. Some *muang faai* are more recently established than others, and some have closer contacts with government departments than others (Ayutthaya 1979).

Membership of *muang faai* is not confined to members of the same village. As Coward (1984) has argued, field location is the determining factor in co-operation in the collective management of irrigation. This can also be explained in the Thai context by the history of the village in Thailand which tended not to be a bounded territorial entity until recent administrative reforms (Hirsch 1989, Kemp 1988). Membership may transcend tambon boundaries as well as those of the village. The organisational pattern follows that of the canals, and sometimes the *muang faai* are divided into sub-organisations that are based around the secondary canals (Tan-kim-yong 1983).

The rules and regulations of *muang faai* are often written down and posted around the jurisdiction of the system. This happens more the larger the system. These written regulations are referred to as '*sanya muang faai*'. The specific rules vary with each *muang faai* but all stipulate the precise regulations for collective maintenance activities, and the day-to-day running of the irrigation system.

The Administrative Structure of *Muang Faai*

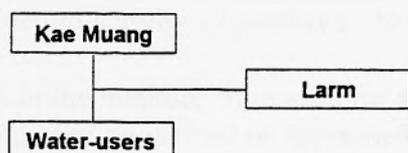
The administrative structure of *muang faai* reflects more widespread hierarchical social patterns of authority that can be found throughout Thai society. The literature tends to emphasise the communal nature of *muang faai* and only refers in passing as to how positions of authority are established, maintained and challenged.

The key offices within most *muang faai* are those of the *kai muang* or canal level leader; the *kae laka* or assistant/secretary; and the *laam* or messenger (Tan-kim-yong 1983, Ayutthaya 1979). These positions vary according to the size of the *muang faai*. For example, the position of *laam* (messenger) is not always necessary when the scale of the organisation allows for the easy passing on of information. In some *muang faai* the above mentioned offices can be incorporated into the responsibilities of one particular office holder.

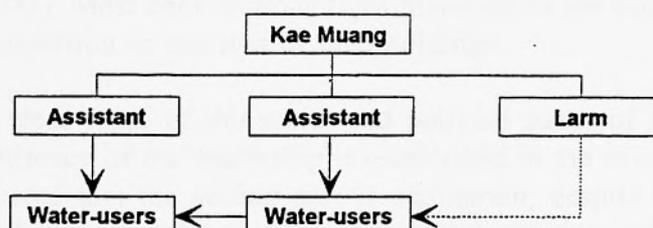
The variety in *muang faai* is perhaps the explanation for the variety of terms used to refer to the canal leaders. The most common term in the literature is that of *kae muang* (Ayutthaya 1979, Tan-kim-yong 1983), although the term *hua naa muang faai* is also used for larger *muang faai* (sometimes with a membership of several hundred). Rigg (1991) refers to the *hua naa muang faai* as the *pan meng*, implying the term is more or less interchangeable. It appears that the office of *hua na muang faai* exists in large systems, and is the co-ordinator of the *kai muang*.

The most widely documented administrative structure is as follows:

1. Small System



2. Large System



(see Tan-kim-yong 1983, Ayutthaya 1979)

Administrative Responsibilities

Ayutthaya (1979) draws a distinction between administrative responsibilities and engineering responsibilities of the *kai muang*.

a) Engineering Responsibilities

- annual ditch and weir inspection
- calculation of members' share of material contributions required for maintenance activities
- supervision/advice for maintenance
- water allocation responsibilities
- control of water use in the ditches

b) Administrative Responsibilities

- enforcement of work agreements
- arbitration of disputes
- control of funds
- keeping of records (of members' contributions, fines etc)
- calling of annual meetings
- assigning work to assistants and messengers

(see Ayutthaya 1979)

The responsibilities of the assistants are partly determined by the needs of the irrigation system and of the *kai muang*. Broadly they are to assist the *kai muang* in the performance of the above duties, but with the added responsibility of acting as the *kai muang*'s representative in negotiating relief supplies from neighbouring *muang faai* in times of water scarcity.

The *laam* (messenger) appears only to be necessary in *muang faai* with a membership greater than thirty. With greater ease of access and communications this position is not of such importance as in previous times. However, compliance with *muang faai* rules and norms depends upon a free flow of information and the capacity of the decision makers to respond to changing conditions. The management of maintenance work needs to be organised as efficiently as possible so as to minimise disturbance to farmers' other responsibilities. Such organisation may require the *laam* to make several journeys to members so as to co-ordinate efficient collective activity (Ayutthaya 1988).

The variation in the methods of reward for and appointment of leadership positions is notable. The leadership may be elected or appointed on a permanent or temporary basis. The system for rewarding the leadership may be in the form of a direct income from the membership, or by means of exemption from water fees or by receiving an additional share of water (Tan-kim-yong 1983). Most contributions from members to the leadership is in the form of rice in an agreed proportion to the area of land holdings.

There is no clear sense of the social and political status of the leadership, nor of how the sense of legitimacy of the leadership is established in the eyes of the wider community. It is strongly inferred that the *muang faai* is egalitarian, despite the hierarchical administrative structure and the prevalence of patron/client relations throughout Thai society. The leadership's responsibility for the performance of ritual activity is a mechanism whereby the sense of continuity from previous generations and the sense of legitimacy of the current administration is generated. At the completion of the annual weir repairs the ritual of *piti phi faai* is performed, for which the *kai muang* has responsibility. This ritual appears to have only been analysed in a functionalist perspective, with no reference to issues of power over the administration of the irrigation system, or of power over interpretation of the ritual.

Tan-kim-yong (1983) notes how the annual weir rituals to honour the spirits of the weir have been reinvented to honour the previous generations of *kae muang*. Coward (1983) regards this to be indicative of the importance of property rights over a sense of biological ancestry. Without primary research evidence it is difficult to chance alternative interpretations. However, it would seem that if one addresses issues of power and social differentiation within the *muang faai* and the village, the performance of ritual in the way that Tan-kim-yong reports is not simply a means for legitimising collective action in terms of hydraulic property rights established by community ancestors, but a means of legitimising the power relations that the contemporary leadership has established. These issues of power are of increasing significance given the incorporation of *muang faai* into state administration structures and the intensified commoditisation and competition over natural resources in rural Thailand, which themselves intensify social differentiation.

Duties and Obligations

Ayutthaya (1979) does make passing reference to the social differentiation within the *muang faai*, but he fails to elaborate on the significance of such differentiation. In his discussion of the duties of members of *muang faai* he draws a distinction between the duties of landowners and of farmers, as follows:

- i) Landowners' Duties:
 - elect leaders of *muang faai*
 - co-ordinate with other landowners to draw up rules (*sanya muang faai*)
 - share maintenance/repair costs

 - ii) Farmers' Duties:
 - obey orders of leadership
 - help maintain/repair weir
 - clear canal
 - not to steal water and to pay fines
- (Ayutthaya 1979 p.36)

Members' contributions are in direct proportion to the size of their landholdings. The main contribution is for the annual repairs, particularly of canals, ditches and channels.

The literature on *muang faai* explains the sustainability of *muang faai* in terms of its perceived egalitarian and communal principles. While not wishing to disprove these findings, it is worth pointing out that there is no serious analysis of the internal dynamics of the *muang faai*. A notion of the 'moral economy' permeates through the *muang faai* literature (see especially Tongdeelert and Lohmann 1991). Rules and regulations are idealised, corruption and abuse of power are unheard of. Face-to-face contact ensures compliance, and leaders are subject to the rigours of frequent elections (Tongdeelert and Lohmann 1991). As true as such interpretations of *muang faai* may be, they surely cannot be substantiated without more detailed analysis.

The institutions of the *muang faai* are presented as essentially equitable. As Tongdeelert and Lohmann write,

'The fundamental principle of water rights under muang faai is that everyone must get enough to survive; while many patterns of distribution are possible, none can violate this basic tenet.'

(1991 p.103)

It would seem that there is some confusion between all members getting enough to survive and a system being equitable. Compliance with *muang faai* institutions would be most difficult if there were no material benefits for those complying. Yet this hardly amounts to an egalitarian or equitable institution. While some systems may be more equitable than others, evidence of the social differentiation in the Thai village would suggest the likelihood of many *muang faai* displaying similar such differentiation. This is not an attempt to undermine the communitarian nature of *muang faai*. But the idealised way in which *muang faai* is written about makes no consideration of the internal dynamics and power relations of *muang faai*, and consequently fails to effectively analyse the influence of rapid change in rural Thailand. In

order to understand how *muang faai* actually operate and how such institutions can be sustained to protect the livelihoods of the members, and particularly of the poorer and often landless members, one should be wary of falling into idealised communitarian myopia.

There is enough evidence of the hierarchical power relations in rural Thai society to make us suspicious of idealised interpretation of rural organisations (Turton 1987, Hirsch 1991). Ayutthaya (1979) discusses the election system in which each landowner, irrespective of the size of his landholdings has one vote. Elections usually take place in the temple or the home of the *phu yai baan* (village headman). However, these are not neutral settings, although not necessarily incompatible with democratic principles. The power and influence vested in the office of the *phu yai baan* in particular has tended to allow him to monopolise village organisational and political resources. These *muang faai* elections are presented as being apolitical; a most unusual feature for any election. It would be interesting to study how the electoral system and accountability of the *muang faai* operate in practice.

Traditional Irrigation of the Karen and Hmong

muang faai type irrigation organisations are also found among the hill tribes of northern Thailand. Detailed evidence of irrigation activities is not available but it is widely asserted that the Karen and Hmong in particular have a sophisticated holistic understanding of their natural environment that fosters sustainable natural resource use (Tan Kim Yong et al 1989, Tapp 1986). The pressures on natural resource availability because of growing populations and competition for resources has led more hill tribe people to abandon swidden agriculture in favour of terraced wet rice cultivation. State efforts to control the production of opium have also forced hill tribes to cultivate other crops and have pushed them into a more sedentary existence.

Water is considered to be collective property and is shared between those who invest time and labour in construction and maintenance of irrigation infrastructure (Tan Kim Yong et al 1989). Decisions and work activities are undertaken collectively, and agreements are made verbally. As more hill tribes are brought closer together and lowland Thais move up into the hills looking for new lands, various ethnic groups are obliged to negotiate and cooperate in the management of natural resources. Tan Kim Yong writes:

'Local irrigation organisations have provided a mechanism to safeguard resource rights and equitable share of benefits for the diverse ethnic communities and cultures of the northern region.' (Tan Kim Yong et al 1989 p.158)

Such equitable management is increasingly under threat. Hill tribes are gradually losing control of land to non-local landlords and companies resulting in a declining role for traditional irrigation institutions and organisations. State irrigation agencies have not been able to overcome the mistrust and resentment that has traditionally characterised the relationship between hill tribes and outsiders (Tan Kim Yong et al 1989). Although there is growing recognition of the value of traditional hill tribe resource management, ultimately it is the political relationship between hill tribes and the Thai state and other external agents that needs to be resolved in order to ensure sustainable resource management. Perhaps more than any other group in modern Thailand, the hill tribes have felt the effects of the extension of the Thai state. Increasingly they find traditional cultural values and practices are being eroded.

Examples of Linkages with the State

muang faai have become increasingly involved with national irrigation departments and policies since the 1939 People's Irrigation Act. This act incorporated *muang faai* areas into national rural administrative structures giving the *amphoe* division of the *changwat* responsibility for the administrative work of the irrigation system. *Amphoe* officials have the authority to appoint heads of irrigation systems (as long as those appointed receive the support of the water users), and to arbitrate in disputes (Ayutthaya 1979 p.38).

The administrative structure of Thai rural development allows the state greater access to rural communities (Hirsch 1989, Kemp 1988) and shifts the accountability of local leaders from their community constituents to the state officials. The patronage networks that tend to operate within the Thai bureaucracy create hierarchical structures in which subordinate officials are dependent on superiors. Local leaders become the agents of the state administration rather than the representatives of the locality.

The drive towards modernisation led to official moves to replace existing *muang faai* with more modern technology. Rural job creation schemes were implemented in order to replace existing wood and bamboo irrigation structures with concrete. Such technical innovation had unanticipated consequences. Prone to siltation (exacerbated by erosion caused by deforestation) they required major repairs and the use of materials that were not locally available. The cost and logistical problems of hiring such equipment was prohibitive and the new dams fell into disrepair and were often abandoned (Tongdeleert and Lohmann 1991).

The increased commoditisation and competition for natural resources has also put great strain on *muang faai* systems. The widespread deforestation of the northern regions of Thailand have been blamed on illegal opportunistic logging (often by coalitions of state, military and business interests), on growing population pressures (partly caused by migration) and on economic pressures that encourage tree-felling for its own sake or in order to plant cash crops (Tongdeleert and Lohmann 1991, Hirsch 1990). These factors have combined to undermine the ecological balance of the *muang faai* regions and the social cohesion of *muang faai* communities.

In the scramble for natural resources the rural people that operated *muang faai* have been seriously disadvantaged. Multi-purpose dams and irrigation systems have been established, the benefits of which seldom accrue to those previously involved in *muang faai*. As Tongdeleert and Lohmann (1991) argue:

'In the end, the bulk of the benefits of modern irrigation systems go to business, large landowners and state bureaucracies (including the army). Golf courses, resorts, housing developments, cattle ranches and agribusiness plantations have been among the more notable beneficiaries of recent state irrigation projects in the North.'

(p.106)

The management and viability of *muang faai* systems are clearly linked to the management of natural resources on a national level, and to the distribution of national assets and power. The growing recognition of the sustainability of traditional, locally specific irrigation systems

and the state's rhetorical commitment to farmer participation now place fresh (if limited) political resources in the hands of rural people. The development contract that had previously been one of obligation of rural peoples to state policies is gradually shifting in favour of the rural people themselves (Vandergeest 1991). However, the sustainability of this current shift of emphasis in part depends on the level of accountability and responsiveness from the state administration that rural organisations can command (see later). We should also remain wary of idealised notions of irrigation systems such as *muang faai*. Such systems will never remain free from changing social, political and economic pressures. In order to gain a better understanding of their sustainability we need a clearer analysis of how they adapt to change.

State Sponsored Irrigation Organisations

As well as traditional management of small-scale irrigation systems, there is a well established history of state involvement in irrigation organisations. The period from the mid 1960s to the 1970s is one of concerted state involvement but with very mixed results. The 1980s witnessed a change of emphasis and growing acknowledgement of the importance of farmer participation at earlier stages of project design, and a range of organisational approaches. There have been several development projects that have incorporated irrigation organisation as part of a general development strategy eg. RJCP, Community Based Integrated Rural Development. In many of these projects irrigation was seen as one of several interconnected components of rural development. This holistic type approach to rural development has been widely advocated by Thai NGOs. However, the problems of balancing the need to integrate different strands of rural development while not wishing to overburden the rural organisations have plagued such an integrated approach.

1. The 1960s to 1970s

Water User Associations (WUAs) were first set up as formal organisations by RID within the National Irrigation System in 1966. The promotion of WUAs was further encouraged with the establishment of the Centre for WUAs in 1968. It was intended to act as a base for the establishment of local WUAs responsible for the operation and maintenance of irrigation systems (Surarerks 1986). The RID envisaged WUAs operating as a 'forum for co-ordination between farmers and project technicians and water delivery administrators.' (Surarerks 1986 p.232)

In the first few years WUAs grew in terms of membership and popularity, but failed to sustain the early enthusiasm (Surarerks 1986, Garforth and Munro 1990). Surarerks (1986) argues that the reasons for the failure of WUAs in this period were to do with the lack of institutional and financial support, and the imposition of inappropriate organisational design models. She summarises the main causes of the disappointing performance of WUAs as follows:

- i) Poor regulations that allowed farmers and non members to use water freely
- ii) Inability of Associations to collect fees, due to lack of legitimacy of the committees in the eyes of members, and corrupt practices of committee members.
- iii) Poor co-operation and co-ordination between committee members and water users
- iv) Failure to ensure efficient, reliable and equitable water distribution
- v) Responsibility for management of too large an area

- vi) Establishment of WUAs was initiated by RID with minimal farmer input, and relied on inappropriate formal regulations
(Summarised from Surarerks 1986 pp240-241)

Palayasoot (1986) argues that the WUAs of this period were largely unsuccessful because they were imposed and operated by government officials. These early experiences with WUAs have influenced subsequent RID policy. The extent to which they have been learnt and put into practice will be discussed later.

At the same time as RID were becoming involved in the setting up of WUAs the Administrative Department of the Ministry of the Interior also became involved in the establishment of Peoples Irrigation Associations at amphoe level. That two government departments should be involved in competing activities is perhaps a reflection of a more general trend in the Thai bureaucracy (see discussion of these general issues in the introduction). However, the Ministry of the Interior initiative also failed poorly and the organisations that had been established had largely disappeared by the late 1970s.

2. 1970s to the present

There has been a clearly recognisable change of RID strategy in the setting up of WUAs since 1981. Several different initiatives have been attempted, and there is at least greater debate on the efficacy of different types of management model.

Cooperatives and Irrigation

The history of cooperatives in Thailand is confused and troubled. For over sixty years there have been agricultural cooperatives operating in Thailand. As with cooperative movements in other parts of the world, Thai agricultural cooperatives tended to be hijacked by rural elites, their structure mirroring the wider rural social structure. They lacked legitimacy and were perceived to be mechanisms by which the state was able to gain further influence in the countryside (Suphaphiphat 1979).

Many cooperatives restricted their activities to credit supply (Garforth and Munro 1990). However, the 1974 Land Consolidation Act established 'water users' organisations in the form of water users cooperatives to be responsible for collecting water charges' (Palayasoot 1986 pt III p.8). Water Users Cooperatives were to be implemented by the Sub-Committee on Irrigated Agriculture and supervised by the district level agricultural cooperatives, whereas farmers associations operate at the tambon (sub-district) level. Thus they operated more as federations of farmers associations (see later under Land Consolidation section).

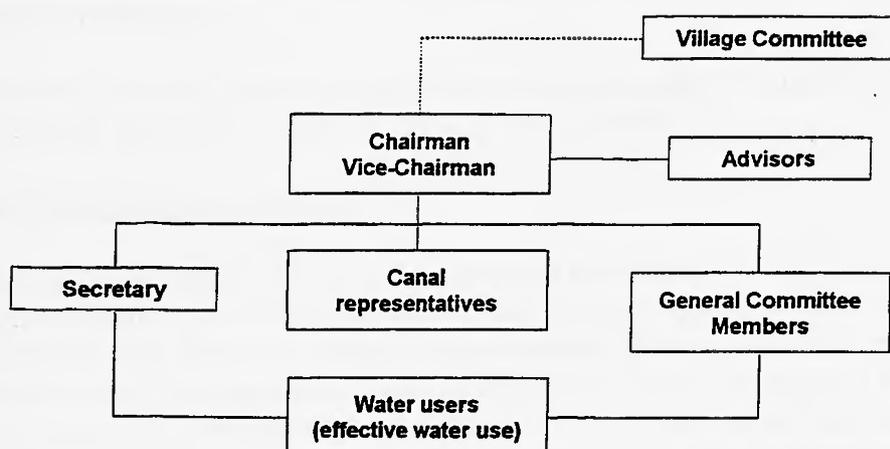
At present agricultural cooperatives operate within a three tier structure from local to provincial and finally to national level. At the national level cooperatives are organised under the Agricultural Cooperative Federation of Thailand (ACFT) which, as of June 1986 had a membership of 1078 agricultural cooperatives (COPAC 1987). The typical agricultural cooperative is a large sized organisation that takes on a wide range of functions from credit, marketing, purchasing, service and guidance. However, there is a shortage of contemporary analysis of agricultural cooperatives.

Water Users Groups

Since the mid 1980s there has been growing recognition of the valuable lessons that can be learnt from traditional irrigation organisations such as the *muang faai*. Earlier WUGs were perceived to have failed because they lacked a sense of legitimacy with local constituents and had not managed to get the farmers to participate. The organisational structure and responsibilities of the 'Water Users Groups' established more recently by RID show remarkable similarities to the *muang faai* as described by Tan-kim-yong (1983).

The 'Manual for Establishing Farmers' Groups' as prepared by the Water Resource Development for Farmers Project of the RID (1987) outlines the structure of the group, and the duties and responsibilities of organisation members.

WUG Structure



Responsibilities of WUG

The responsibilities of WUGs are to ensure compliance with group decisions, operation and maintenance activities and as an intermediary between water users and government departments. They are described as follows:

- election of committee members
- co-ordinating among members to ensure compliance with group rules over water allocation, and resolving conflicts
- co-operate in maintenance activities
- administer and encourage efficient water use
- to act as an intermediary between the water users and official agencies

The Water Users Group Committee

The WUG committee operates as the administrative body of the group, and incorporates the WUG into the established Thai development administration structure. It comprises between seven and fifteen members, as follows:

- WUG Advisors: A broad group of established village level officials to advise on administrative and co-ordinating work, which includes the tambon council, deputy district leader responsible for the tambon, tambon agricultural officer, community development worker, public health worker, teacher and other relevant officials.
- The Chairman has administrative responsibilities within the group (viz. water use and arranging meetings), and to liaise with RID particularly if there are any repairs needed.
- Vice Chairman acts as the Chairman's assistant
- Secretary takes on general secretarial duties and liaises with group members to arrange meetings
- Canal Representative operates and maintains gates and canal structures

Committee members also have several joint responsibilities in the formulation and enforcement of rules and regulations, settling disputes, and co-ordinating with the village and tambon committees.

(The above outline is summarised from an excerpt from the 'Manual for Establishing Farmers' Groups' that appeared in Trimnet Issue 1, March 1988 p 21)

Land Consolidation and WUGs

The Land Consolidation Act of 1974 attempted to reallocate land in the northern Chao Praya delta into smaller numbers of parcels of land to encourage more efficient irrigation practices (Plusquellec and Wickham 1985). Field channels, ditches and roads were to be built and farmers were to be organised as 'water users cooperatives' (Palayassot 1986 pt.III p.8). In the first stage of the programme from 1973 to 1976, 13 500 ha. of land were developed. The second stage of the programme extended to the Central Plain and covered a further 47 000 ha. from 1976 to 1982. A further project was implemented in Phitsanulok covering a further 95 000 ha. of land (Plusquellec and Wickham 1985). There was an increase in the amount and reliability of dry season irrigation water, higher rice yields and higher land values. However, Plusquellec and Wickham (1985) remark that these results were not entirely attributable to the land consolidation projects.

The performance of the water users groups is also rather unclear. Several government agencies were involved in the establishment of water users groups. The Department of Cooperative Promotion had main responsibility for the establishment of WUGs, working alongside the Royal Irrigation Department, the Agricultural Extension Department and the Provincial Land Consolidation Offices (Palayassot 1986). The available evidence is remarkably unclear as to the structure, functions and performance of the WUGs. Palayassot (1986) seems to suggest that the WUGs were originally established as multi-functional cooperatives until 1986 when they were 'modified to the effect that a cooperative of water users is to become a single-objective cooperative' (pt III p.9). However he offers no evaluation of their performance, nor any explanation as to why their structure should require modification. Plusquellec and Wickham (1985) do not discuss the organisational structure and performance of WUGs under the Land Consolidation Act but do remark that WUGs',

'major purpose is to help farmers organise the distribution of water and maintenance activities, but these purposes do not appear to be important enough to the farmers to sustain high levels of commitment and involvement.'

(1985 p.46)

The Nong Wai irrigation project was implemented under the land consolidation strategy. Nong Wai was one of three pilot projects that experimented with the establishment of WUGs (Katphalia 1984). Water Users Groups were regarded as being essential for the overall success of the project. Poor farmer organisation had resulted in unreliable distribution of water and disputes among farmers. In 1981 many poorer farmers unable to guarantee reliable access to water supplies did not even plant a crop (Katphalia 1984).

WUGs in the Nong Wai project were incorporated into the multi-functional Nong Wai Agricultural Cooperative Society (NACS), which developed a steering committee on WUG operations (Katphalia 1984). The WUGs were responsible for the distribution of water among members, ensuring compliance with group rules and regulations and for operation and maintenance. In assessing the apparent success of Nong Wai WUGs operating within cooperatives, Anukularmphai et al (1986) conclude;

'the success of water users' groups in this form is attributed to the fact that the cooperatives usually have been already firm before they decide to include irrigation water allocation and maintenance in their business lines.' (pt III p.27)

The experience of the Nong Wai project led Anukularmphai et al (1986) to conclude that providing incentives (such as fertilizer) to farmers to establish WUGs, and incorporating them into large multi-function cooperatives would cause accounting and disbursement problems. It was therefore decided that the group should start as a small organisation with primary responsibilities for distribution and maintenance, adopting other responsibilities as it becomes more established.

Social Organisers and Irrigation

The Social Organiser (also called Community Organiser) strategy was a further initiative in response to the poor performance of existing water users groups. Working on the premise that farmer participation was an essential precondition for sustainable management of irrigation, the social organisers were envisaged as being intermediaries between the RID and the tambon council and rural communities. As the initial experiments with social organisers progressed certain practical difficulties arose.

The difficulty of coordinating the three main interested parties was perhaps too great a responsibility for one office holder. The Social Organiser was assigned to the provincial RID. Poor coordination between the tambon and RID was partly attributable to the distinct responsibilities each perceived for itself. The local administration saw itself as being responsible for the social issues, whereas the RID was more concerned with technical matters. Both the tambon and the RID had dubious legitimacy in the villages, and they themselves tended to have difficulty in accepting the need for farmer participation (Tan Kim Yong 1990). Working as an intermediary the social organisers were often seen by each party as being too closely affiliated to the other. Thus the RID often considered social organisers to be working

too closely with farmers, making commitments that could not be fulfilled. On the other hand, social organisers needed to distance themselves from the RID in order to gain the confidence of the farmers.

A scheme such as the social organisers inevitably faced financial constraints. It would require a major financial commitment in order for it to be implemented on a wide scale. Early social organisers faced difficulties that perhaps limited their motivation due to their temporary and uncertain status, low pay, long periods spent in the field, and limited institutional support. They were also not immune from the competition for resources within the RID.

A later development was to employ a local farmer as the social organiser (Tan Kim Yong 1990). It was hoped that by doing so financial costs would be reduced. Tan Kim Yong also argues that it was an empowering process, involving farmers in all stages of the project, 'not as participants, but in the key role as social organiser to facilitate a joint management practice' (p.125). A farmer employed as a social organiser needed a range of qualifications (particularly literacy and interpersonal negotiating skills), and also needed to be able to manage his own farming responsibilities alongside his new social organiser responsibilities. More recent initiatives have aimed at recruiting recent graduates and creating a career structure for them within the RID (Bruns 1993).

While there is evidence to suggest that the social organisers did enjoy some degree of success, the practical problems and financial costs involved were largely prohibitive. However, this initiative highlights the growing acceptance of the need to

- tap local knowledge and encourage participation,
- overcome farmers' perceptions of the RID as outsiders
- establish a better flow of information, and better coordination.

These themes persist in all the discussions of the performance of local organisations.

Issues of Legitimacy and Participation

Despite the attention to the design of irrigation organisations there have been recurring problems. The reluctance of farmers to participate in water users organisations has been a constant theme in irrigation in Thailand. As has been discussed earlier, this phenomenon has often been attributed to the cultural characteristics of rural Thailand, and the lack of community solidarity. Such culturally reductionist explanations of behaviour are often too simplistic and unconvincing. The expectations of rural Thai 'communities' operating as idealised homogeneous communities is largely attributable to a failure to pay attention to the internal power dimensions of rural Thailand, and the patrimonial nature of the national state development structure into which rural Thailand has increasingly been incorporated.

It is only recently, and rather reluctantly on the part of the state administration, that the issues of the relationship between the state agencies and the rural organisations have been brought to prominence as key issues. The growing emphasis on the participation of rural peoples in development projects, as articulated in both the Fifth and Sixth National and Economic Social Development Plans, is partly in response to earlier managerial problems. Critics of state commitment to participation and decentralisation regard such strategies as mechanisms to ensure more efficient and effective state penetration into rural areas.

Poor coordination between the state agencies and farmers can also be attributed to very distinct ways of thinking and discourse, and very different values. The workings of the state bureaucracy and of the village are often mutually incomprehensible. For example, Bruns (1993) argues that farmers are more keen to cooperate in maintenance when they perceive it to be absolutely necessary, rather than follow RID guidelines on regular maintenance which is seen as tiresome and overly complicated. Since the bureaucracy operates within the dominant discourse and set the agenda for action, it is the farmers who are disadvantaged. The success of local organisations will be partly determined by their capacity to deal with external forces within the dominant discourse, and to articulate their own interests within this discourse. As concepts of community resource management, environmental sustainability, participation and decentralisation become incorporated into national strategies, the capacity of rural people to present their interests will be enhanced.

The literature on participation and decentralisation makes constant reference to the malleability of such concepts. As Cohen and Uphoff argue, participatory strategies must be analysed in terms of who is participating, and how and when participation is occurring. State commitment to such policies in Thailand has been fiercely criticised as decentralisation in name, but recentralisation in practice.

However, there have been some successes in participatory strategies in irrigation. Bruns (1993) regards the KKU/RID small-scale irrigation programmes in northeast Thailand to have responded well to their goals of achieving participatory management. It is interesting to note that only a small proportion of farmers receive the benefits of irrigated water from these initiatives. Bruns (1993) does not elaborate on this point, although it would seem to be central. If control over such a vital resource is to be concentrated in the hands of a small proportion of local farmers, it would be reasonable to expect these farmers to gain positions of political and economic advantage. In evaluating the appropriacy and success of such strategies, surely it is essential to consider who is participating in making decisions over the siting of irrigation structures, and how these decisions influence the social differentiation of villages concerned. The newly established relationship between farmers receiving irrigation and the irrigation department will inevitably influence the relationship between the bureaucracy and the village as a whole.

These relationships will in turn influence the capacity of irrigation organisations to take on other functions. The history of the Thai development administration has been characterised by a tendency to deal with local elites and thereby strengthen their positions of authority. Local organisations in Thailand have often failed because of their lack of legitimacy and accountability. In order for these organisations to operate equitably and to be accountable to their membership, they must be representative of the memberships' interests. Too often development strategies have been presented as meeting goals of equity and participation, merely because they have gone through local organisational channels, even though these channels themselves do not operate in an accountable and representative manner.

Equally, state departments must be seen to be accountable and responsive to local organisations. This depends on the relationship between the RID and the local organisations, and on the relationship between the lower levels of the RID and those at higher levels (or Cabinet) who make the final decisions.

The findings of the RID workshop on irrigation management (Anukularmphai 1986) recognised the importance of the organisational dimensions of irrigation, and led to recommendations for greater emphasis on integrated rural development, strengthening the capacity of WUGs and ensuring that there is full farmer participation from the earliest stages of the project.

NGOs and Notions of Village Communities

The state has not been the only body involved in the establishment of rural organisations. In some situations the state has collaborated with other organisations, for example in the joint initiative of Khon Kaen University and RID. NGOs have increasingly come to regard the establishment of self-reliant local organisations as being central to their overall objectives (Tingsawate and Tipps 1988). This has often involved adopting an approach that regards rural livelihoods to be interconnected and therefore requiring integrated development strategies. NGOs have also been keen to establish networks among themselves and rural organisations with which they have been involved, and thereby work towards strengthening rural civil society. Some of these approaches will now be discussed in more detail.

Community Culture

The concept of 'community culture' has become a dominant ideology within the Thai NGO movement (Phonghit 1989). It is a loose ideology that uses notions of a 'return to the roots' to rediscover an essentially Thai community-based culture that it argues represents an alternative to current models of development (Phonghit 1989, Santasombat 1992). This lost community is argued to be found in the villages and villagers of Thailand. The cost of recent high rates of economic growth are argued to have been the destruction of the natural environment and of rural communities; the 'backbone' of Thailand. It emphasises the need for self-sufficiency and autonomy for rural communities, and advocates an integrated, holistic approach to development, that is based on the community as the primary unit of social organisation.

Community is a malleable and awkward concept. Too casual use of such concepts is fraught with danger. The notion of community can be used to generate a sense of solidarity, but can also be used to distil social conflict and perpetuate oppressive power relations (as happened in the campaign against the PFT). In searching for the 'true' Thai community NGOs are reinventing the past but are in danger of idealising a 'golden age' notion of the past that never existed. The past is not simply what the present is not (Vandergest 1991, Rigg 1993). Romantic notions of a lost past can overlook the conflict and dynamism that is inherent in all social organisation. However, it must be acknowledged that veneration of rural communities and indigenous knowledge creates an assertiveness and self-confidence in rural peoples' capacity to play a part in development and to challenge established interpretations of national and local development.

Rigg (1991) argues that NGO sponsored village organisations are as likely as state sponsored institutions to fail in meeting the needs of the villagers, and to fail in achieving sustainability and independence. While this may be an overstatement, there is evidence to suggest that those organisations that derive from a need identified by the people themselves have greater chance of achieving sustainability (see Oakley et al 1984). There is evidence of

rural peoples organisations and spontaneous environmental pressure groups that have been established by the concerned people themselves (Verhagen 1987). Rather than being formed in response to external analysis of rural people's problems that assumes the inability of rural people themselves to analyse their situation, these groups rise out of rural people's capacity to utilise all external intervention, be it state or NGO sponsored, and to apply their own notions of community to generate a sense of solidarity.

The organisational principles that Thai NGOs of the community culture school utilise are quite different from the principles of bureaucratic organisation. The commitment to concepts of 'traditional knowledge' and 'traditional culture' inspires the formation of organisations that are legitimised by the application of moral concepts firmly rooted in Buddhism. Gohlert (1991) refers to the NGO Redd Barna's strategy of establishing rice banks based on the principle of *tam bun* (merit making) rather than the share-holding principle, and of utilising the concept of *long khaek* (mutual help) to counteract the divisive effects of commercialism. Clearly Buddhism is a powerful motivating force for many rural people. Since the three pillars of Thainess are widely defined as Nation, King and Buddhism development strategies that utilise Buddhist concepts are likely to gain a strong sense of legitimacy.

NGOs and Integrated Rural Development

The holistic approach to rural development has gained favour with contemporary Thai NGOs. This approach is seen as being compatible with Thai Buddhist notions of the relationship between man and the natural environment, and thus gives some spiritual legitimacy to notions of sustainable development. On a managerial level the holistic approach encourages an integrated approach to rural development. There is strong emphasis on the notion of community as the basic organisational unit in rural society, coordinating the activities of informal organisational activities.

The Integrated Rural Development Programme was an NGO project that began in 1979 with assistance from the Friedrich Naumann Stiftung (FNS), and some coordination with the government departments of Agricultural Extension, Community Development and the District Health Office (Gohlert 1991). It aimed to utilise traditional knowledge and informal organisational practices (such as communal irrigation organisations, wat committees, inter-village wat networks, and exchange networks) building on traditional cultural practices to strengthen the sense of community as a vehicle for protecting rural livelihoods.

It is interesting to note that IRDP interventions faced many difficulties. They managed to overcome initial suspicions that they were communists but also faced serious problems of finding appropriate leaders within the villages. Given the structure of the state-sponsored village leadership IRDP tended to favour informal leaders thus establishing a parallel power structure. IRDP concluded that 'informal leadership and the support of the middle class' (Gohlert 1991 p.91) were critical to their gaining influence in the village. As necessary as such an approach may appear to be it clearly represents a reinterpretation of the village, and a reinvention of the community. Any external development intervention cannot be expected to benefit all equally, but it is not clear how the distribution of benefits as a result of this type of intervention affects internal relations of power and production.

The Population and Community Development Association of Thailand (PDA) has been credited with adopting an integrated approach to rural development that has been successful (Hafner 1987). Working on the premise that integrated development is best achieved from running a narrowly focused project and expanding from that base, PDA take the rather unorthodox approach of building their projects up around family planning. From family planning they then extend their involvement to water resources, renewable energy and home industries, agricultural and livestock production, cooperative marketing, and demonstration farming (Hafner 1987).

KKU-NZ Irrigation Project in North East Thailand

Many university departments in Thailand have been active in development initiatives. The KKU-NZ irrigation weir construction project in the northeast of Thailand has been particularly prominent in issues of irrigation management and local organisations (Hafner 1987). It grew out of the Small Scale Water Resources Development Project of Khon Kaen University that was established in 1978. The scheme aimed to build weirs for small-scale irrigation that would tap the important reservoir of village level management and technical skills (Hafner 1987 p.92). Despite claims to encourage farmer participation it is interesting to note that management issues and formation of water users groups were not included at the initial stages of the project. The main focus of the project was simply the construction of the weirs. Hafner recommends that community organisers should play a role in 'eliciting organised farmer participation' (p.95) but makes no specific recommendations as to how farmers should structure irrigation organisations.

As the project continued, management issues became more prominent. The notion of community and village level organisation that underpinned the project allowed for a style of organisation that was not as formally structured as RID water users groups (Bruns 1988). It was argued that structured WUGs were not always necessary on a small scale project and such a specific focus of organisation did not fit with the way that irrigation water was used. Bruns argues that village leaders commanded more authority than special purpose organisations and would be more capable of enforcing regulations and distributing water equitably. Bruns does acknowledge that WUGs may be necessary for larger scale projects where water users from more than one village would need to cooperate. Bruns concludes;

'The stress should be on how to improve local capacity to operate and maintain projects, in ways that are sustainable and serve local needs. At best water users' groups are only a tool to assist this process. If the full set of users, or their representatives, is involved then local operation and maintenance can rely more on existing village institutions for creating and maintaining collective goods, with an appropriate mix of roles between irrigators and village leaders.'

(p.22)

Notions of Community

This approach to irrigation management is clearly very much rooted in a particular interpretation of the village community and the authority of village leaders. It seems to assume that the legitimacy of village leaders is based on village consensus, and that such leadership is essentially equitable. While this may be true in specific cases it cannot be

assumed to be true in all. As has been stated earlier, state linkages with the village in Thailand have tended to coopt village leaders into a patronage network that ultimately serves the interests of the state and rural elites. Penetration of the village by the state has not gone unchallenged, but there are serious dangers in making assumptions about Thai villages that are based on idealised notions of the village community.

Many NGOs see the need to establish local level organisations as central to the overall strategy of effective and sustainable, participative development. However, NGOs like other external agents, face practical difficulties in establishing RPOs. In his survey of rural peoples organisations (RPOs) in the north of Thailand, Garforth (1993) concludes that equity objectives were sacrificed, even by NGOs committed to equity, in order that the RPOs established would operate efficiently and effectively. NGOs are often faced with a dilemma of whether to target formal or informal leaders (see comments on IRDP above). The approval of the *phu yai baan* was considered to be essential for NGOs, even though the *phu yai baan's* own position often depends on his relationship with state patrons (Garforth and Munro 1990). When NGOs target informal leaders (see Gohlert 1991 on IRDP), they not only expose their vulnerability in terms of their claims to be representative of rural people, but also risk direct confrontation with established state structures.

Local Organisations, NGOs and Rural Civil Society

Meaningful participation and organisational sustainability is associated with organisations that are not established by external agents, particularly the state, and over which members have a meaningful sense of ownership and influence. Yet such organisations face serious obstacles to their viability: the same obstacles that are largely responsible for the situation that has created the need for the organisations in the first place. The sustainability of village organisations that are in conflict with existing power structures depends not only on the sense of shared interest among the members, but also on their institutional capacity to deal with outside forces: particularly, their legal rights, access to markets and credit that might otherwise be denied, access to information and technology, the ability to negotiate and represent their own interests within the dominant discourse. This particularly relates to their ability to make claims on the state bureaucracy, and the accountability and responsiveness of that bureaucracy.

The Thai NGO movement would appear to represent a particularly influential actor in the strengthening of rural civil society and the democratisation of the development process in Thailand. Coalitions of NGOs and coordination between them has already had a profound effect on the development and political process in Thailand. As notions of participation and decentralisation become central themes of state policy, an organised and competent NGO movement is able to contest state interpretations of such malleable concepts. The NGO movement and grassroots organisations have had some successes on the national political level, intervening to halt specific projects (eg. the Nam Choam dam) and having some influence on national policy (eg. in successfully pushing the government to introduce and enforce a logging ban). They were also active in working with PollWatch to monitor electoral abuses and encouraging rural people to vote in the 1992 election.

A rhetorical commitment by the state to preserve the natural resource base and viability of rural communities gives rural people political ammunition to make legitimate challenges to

state policy. However, the vested interests of state and rural elites should never be underestimated. Grassroots initiatives in Thailand have historically faaired rather poorly. Any alternative development strategy will ultimately be judged in terms of its success in meeting the economic needs of rural people.

NGOs themselves have had to deal with the might of the state and the development administration. Although there have been recent state commitments to work in partnership with NGOs and registration regulations have been eased, there is still a poor record of coordination in the field. Evidence would suggest that NGOs are regarded by the state primarily as service delivery agents to compliment state initiatives. Once NGO projects are considered to be up and running government departments move in to take over. There is still a great deal of state mistrust of NGOs and they are still regarded as a potential political threat to the state. While they may have valuable contributions to make to the development process, it would appear that the Thai state is determined to control how these contributions should be made. NGOs involvement in the broad pro-democracy movement is most likely to exacerbate this mistrust and suspicion.

Conclusions

The discussion of irrigation organisations in Thailand must be placed in the wider context of urban/rural and state/civil society relations. The contributions from management analysis have developed organisational models that have their value, but which faail to address the central issues in the poor performance of rural organisations in Thailand. The themes of poor farmer participation and lack of legitimacy of state sponsored organisations can not solely be explained in terms of management style.

The development policies of recent times have been decided by state elites, with dubious benefits for the majority of the population (approximately 70 %) still rely on agriculture for their livelihood. As centralised, export-oriented development is being challenged, so too is the accountability and legitimacy of the state. For many who advocate an approach to development that is centred on environmental and cultural sustainability, the strengthening or creation of local organisations is a central strategy that is itself interlinked with the democratisation of rural civil society.

State involvement in rural organisations in Thailand has been centred on the village and the administrative structure of the tambon. Evidence suggests that, on the whole, state involvement in rural development has imposed a development strategy that has sought to integrate the rural periphery into the Thai nation and into national development strategies that have benefited urban elites. Current commitment to participation and decentralisation is a continuation of this strategy rather than a radical reversal.

The potential for rural organistions to achieve autonomy and sustainability lies in their capacity to overcome the political and economic obstacles as much as the managerial obstacles. In a changing and increasingly complex political and economic environment rural organisations must also be able to take on a range of new functions and deal with unfamiliar institutions. In taking on such new functions rural organisations must balance their perceived need to do so, with their institutional and organisational capacity to do so.

The focus on notions of community as adopted by many Thai NGOs has been in response to the perceived need to adopt an integrated development strategy that utilises indigenous knowledge and technical skill. However, the adoption of notions of community has tended to confuse villages as they are structured within the Thai administration with an idealised notion of community as a relatively homogeneous entity. The community culture school of development is steeped in notions of 'tradition' but avoids issues of how tradition and community can be interpreted and utilised for very diverse ends. The internal social differentiation which is a key feature of rural Thailand and which can be anticipated to be exacerbated in conditions of social and economic change and intensified competition for natural resources, also tends to be overlooked.

The themes of participation and accountability have persisted throughout this paper. In conclusion the issues that have arisen from consideration of these themes will be highlighted.

- The factors that influence participation in rural organisations have often been attributed to cultural explanations that emphasise the reluctance of Thai peasants to cooperate with each other, and with the development administration. However, there is plenty of evidence to contradict this perspective. Rural people in Thailand have organised themselves in a range of activities and there would appear to be a renaissance of collective activity as part of an overall strengthening of rural civil society. State development initiatives no longer go unchallenged, and rural people are gaining a new self-confidence in organising a range of collective activities managing resources, production, services, marketing and political representation. As networks between RPOs continue to grow, and national and local government are increasingly vulnerable to the influence of civil society, these trends in rural Thailand can be expected to continue.
- Maintaining the collective spirit in any organisation is always difficult. Collective activity requires a number of factors successfully working together and is never immune from the divisive effects of economic, social and political change. It would appear from the evidence from Thailand that rural people join an organisation that can offer them something in return for their involvement. If an organisation is no longer able to offer rewards that are considered to be worth the effort that members must put into the organisation (or if an alternative organisation is able to offer better rewards) the organisation can be expected to lose its support base. Except perhaps in times of acute political tension, people are motivated to join organisations for material benefits rather than for ideological reasons.
- There is a growing emphasis on the need to reinvent a sense of shared interest based upon concepts of community and traditional knowledge. This approach is particularly associated with the NGO movement, but as the NGO movement becomes increasingly involved in collaborative work with government agencies, it can be expected to spread further afield. However, NGO interpretations of community and tradition are quite distinct from those of the state. NGOs need to be wary of the pitfalls of falling into fundamentalist-type interpretations, and of assuming that they have a monopoly of interpretations

of community. Rural people themselves are quite capable of adapting notions of tradition and community in order to protect their own interests.

- There has been much discussion of the failure of rural organisations and of government and non-government organisations to gain a sense of legitimacy with rural people. Legitimacy of organisations is determined by a number of factors;
 - i) capacity to deliver expected benefits. As has been said already, organisations tend to be joined because people desire specific material rewards. If these benefits are not forthcoming then the organisations cannot be expected to be sustainable.
 - ii) equity and reliability of the distribution of benefits
 - iii) accountability and responsiveness of organisations to their membership

Sustainable RPOs in Thailand need to develop the capacity to make legitimate claims on the state development administration so that development is seen as a democratic right which the state is obliged to provide, rather, than as has previously been the case, a privilege which the state grants as a patronage contract according to its own interests. The ability of RPOs to make such claims depends on the strength of rural civil society, which in turn depends on the coordination between a range of RPOs, NGOs and political parties. This state of affairs would represent a dramatic reversal of previous trends in Thai rural development, but as recent political events have illustrated is not totally unreasonable to expect.

Neither the Thai state nor the Thai bureaucracy should be considered as cohesive, static entities. Both are riddled with internal conflict. The responsiveness of the Thai bureaucracy to the demands of rural people depends on the capacity of the lower levels of the bureaucracy being able to make claims on higher levels. The complex and competing structure of the Thai bureaucracy is a serious impediment to such responsiveness that is further exacerbated by patronage networks. Calls for reorganisation of the Thai bureaucracy must appreciate the political realities. The Thai bureaucracy is powerful and ever expanding. Even if it could be reformed, one could not guarantee that other factions of the state (viz. military and business) would not move in to fill the political vacuum caused by a declining bureaucracy. No state agency has a particularly proud record in initiating rural development that meets the needs and wishes of rural people.

- The sense of ownership of both the resources that organisations manage and the organisations themselves is of great importance in both ensuring participation and accountability. There would appear to be a connection between the legal rights that are established and the claims that users can make. For example if weirs are paid for by farmers they are more responsible for maintenance. However, if weirs are paid for by the state agency it may well be that maintenance will not be so well performed as when the weir falls into disrepair the state agency will move in to carry out repairs. When a natural resource is perceived to belong to an outside agency it is less likely to be perceived and managed as common property, and is more vulnerable to free-riding.

- Financial contributions by members are a means of ensuring financial sustainability and also of accountability of membership and of leadership. An individual financial contribution by members may well act as an incentive to participate and ensure others are participating. Monitoring of the leadership's performance of financial affairs is a further way of ensuring accountability. However, financial contributions alone will not generate a sense of ownership. If they do not they will be even more resented.
- The holistic or integrated approach highlights the interconnectedness of rural livelihoods, and the importance of adopting a strategy by which they can best be incorporated. This perspective leads to consideration of what range of functions an organisation should undertake. Evidence would clearly suggest that it is best to start from a single, relatively narrowly defined function and once this has become established, to then take on other functions. When other functions that are considered necessary for rural livelihoods are not taken on, or are taken on by too wide a range of other organisations, poor performance is likely to result.
- It must be recognised that within the existing structure of the bureaucracy the development of multi-function organisations has been impeded by the process of registration of organisations with specific responsibilities with specific ministries.
- The call for integrated development places greater responsibility on the notion of an integrated social structure at the rural level. This is usually talked of in terms of the 'community'. Yet community is only a concept and as such needs to be constantly reinvented in order for it to endure. The dangers of idealised notions of community have already been mentioned. At this point it is worth mentioning that although community can be seen as an alternative to bureaucratic organisation, contemporary rural society must be capable of operating effectively in the current national institutional and organisational context. A sustainable community will depend on the performance of the organisations that operate within it, and their ability to work in accordance with community interests.

Recent developments in Thailand should be seen as encouraging, although far from complete. Pressure has been exerted on the state to be more responsive to local needs and interests, and rural people are finding a political voice to articulate these needs and interests. However, this trend should not be assumed to be irreversible.

Appendix A

The Tambon Council and the Bureaucratisation of the Village

A crucial innovation in explaining the integration of the periphery and what Hirsch has referred to as the 'state in the village and the village in the state' (1989) is the rural development administrative structure and the hierarchy of social relations upon which it depends. The main development ministries are the Ministries of the Interior, Agriculture and Agricultural Co-operatives, Education, Industry and Public Health (Judd 1989). The National Economic and Social Development Board is responsible for the formulation of the national five year plans. Plans are referred to the National Rural Development Committee and the cabinet, and implemented through the hierarchy of Provincial, District, Tambon and Village Councils. It is the Tambon Council that is the basis for community based rural development.

The Tambon Council

The tambon (or sub-district) council was first introduced in the administrative reforms of 1914 (Douglass 1984) but has become an increasingly important aspect of state development policy. Given greater priority under the rural development policies of the Kukrit regime (1973-1976) they were assigned a particular role in enhancing participation and self-reliance which still continues. The Sixth NESDB emphasises the role of the tambon and of village committees writing:

'Rural development guidelines for increasing the participation of people's organizations and the private sector will thus continue to emphasize the role of sub-district councils in developing their own localitiesvillages with high development potential may be developed into model villages exemplifying the achievement of self-reliance through government support and mobilization of local resources'
(NESDB 1987 pp.368-369)

The tambon and the administrative hierarchy of which it is an integral part have been widely criticised for perpetuating elitist domination of village level institutions that enhance the power and influence of the state and outside interests to the detriment of the poor (see Turton 1987, Hirsch 1989, Rigg 1991). They have become the established framework for development intervention at village level.

The Thai development administration is divided into provinces (*changwat*) and districts (*amphoe*) which are in turn divided into sub-districts (tambons). The tambon is led by an elected head (*kamnan*). The sapha tambon (sub-district council) has responsibility for preparing the five year plans which detail the projects requested at sub-district level; work to be carried out under the Rural Employment Generation Programme; and requests to ministries for local assistance (see Hirsch 1989 p.45). Since the tambon is dependent on the state for its income it has little independent influence. Rigg (1991 p.203) argues that the tambon tends 'to be dominated by the economically rich and politically powerful' and because of its central role in rural development administration opens fresh avenues for financial and political advancement. The *kamnan* is widely referred to as 'the eyes and ears of the state in the village' (see Turton 1987, Hirsch 1989). Since all state development initiatives must go through the *kamnan* he has a crucial role as the intermediary between development funding and the villages that may receive such funding. However, the role of the *kamnan* is not

restricted to development intermediary. Both business organisations and political parties go through the kamnan as an intermediary between themselves and the village. Turton writes:

'large sums of money are now handled by the council and decisions on the allocation of this money may be made without putting out to tender. The office-holder attracts the attention of all outside interests wishing to become involved in the locality, whether for trade, commerce, extraction of natural resources, construction work, development projects, matters of law and order or security, or political campaigning for the Provincial or National Assembly elections'

(Turton 1987 p.86)

The tambon (sub-district) is then divided into the basic administrative unit; the *muubaan* or village. The *muubaan* is the embodiment of the state creation of the village entity: an administrative unit that is clearly defined and whose inhabitants can be easily 'registered and counted' (Vandergeest 1993 p.5) and therefore easily monitored. The head of the village committee (the *phuyai baan*) holds similar influence to the *kamnan*, but the role of the *phuyai baan* is more clearly one of maintaining 'order and peace in the village and arranging for the reception of outsiders, notably government officials' (Hirsch 1989 p.45). With the presence of the Village Scouts the *phuyai baan* has an even greater role as enforcer of state order within the village, with monopolistic control over the use of force.

Participation for villagers is through the monthly village meetings, attendance at which is compulsory on pain of a 50 Baht fine. Participation in the decision making process for most villagers ends at attendance of such meetings (Rigg 1991). Most of the time is allocated to official announcements from tambon and amphoe level and the reading of minutes (Hirsch 1989). The sustainability of these village institutions relies on the differentiation that exists within the villages, and which has itself been exacerbated by the development process. Despite the rhetorical commitment to participation and self-reliance through indigenous institutions the actuality perpetuates a process of rural social and economic differentiation that strengthens the structural position and bargaining power of the elite patrons.

The structure of the Thai development administration plays an important role in understanding how the marginalised are structurally disadvantaged through the mechanism of supposedly indigenous institutions. The very notion of community and 'village' as adopted by both the state and NGOs is deeply embedded in these institutions. As Vandergeest (1993) argues:

'The council has become an important feature of rural life, but it is not an 'indigenous' institution, and the village heads and kamnans often do not represent a local community. If these offices are to be the basis of community authority, they would need to be re-invented so that the village heads and kamnan were more accountable to villagers.'

(Vandergeest 1993 p.18)

The sense of community that the Thai village is supposed to represent is clearly related to the political history of the state extending its power and influence over the rural population. The state's current commitment to concepts of participation and decentralisation must be analysed in this light.

Patron/Client Relations

Patronage networks are a feature of many societies and have often been presented as having a negative impact on political and social development. Yet patronage can also provide stability and social cohesion. The patron/client relationship is a contract with obligations and responsibilities for the patron as much as for the client. However, Rigg (1991) has argued that patronage in Thai society and the Thai bureaucracy has impeded grass-roots development and is the central explanation for the inefficiency and corruption associated with the bureaucracy. As the polarisation of Thai society has increased with economic growth, so has the need for clients to ally themselves to influential patrons (Douglass 1984). This increase in demand for influential patrons has given the patrons a stronger bargaining position with less responsibility and accountability to the client. The hierarchical administration structure has further enhanced the position of the patron and has spread the network of patronage from the urban centre to the village (Gohlert 1991).

The patron/client networks are seen as impediments to the development of Western style political pluralism and of a Weberian bureaucracy (Girling 1981). The professional progress of a young bureaucrat is dependent on his ability to secure the support of a benevolent patron (Rigg 1992). The number of development agencies has increased drastically over the last forty years and have become the basis for 'empire building' (Nakata 1981p.68). Although it is conceivable that an enlightened patron may encourage some degree of decentralisation within the bureaucracy, this still occurs within the framework of patron/client relations in which power emanates from the centre and from the top. A lowly client cannot push for decentralisation on his own initiative.

In the village, as it has been constructed within the tambon administrative reforms, patron/client relations have exacerbated social and economic differentiation. Thus, it can be observed that

'traditional village leaders have been joined, as village life has become increasingly commercialized and differentiated, by additional patrons who owe their position in village society to their economic power' (Rigg 1991 p.202).

Development intervention, whether from the state or from NGOs, can be regarded as a fresh resource in the village. The ability to control the distribution of and access to such a valuable resource is the basis for considerable political power. As has been said earlier, development projects require the approval of local leaders (the phuyaibaan and kamnan) who themselves owe their position of authority within the village to the administrative power structures established in the tambon administration, and ultimately to the state.

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Christopher Southgate

Introduction

Almost 90 percent of the population of Tanzania are primarily engaged in agriculture-related activities, a sector contributing 60 percent of mainland GDP in 1991 (EIU 1993). Since attaining independence in 1961, great emphasis has been placed upon the potential role that increased agricultural production could have in terms of the national economy and standards of living. Tanzania is well endowed with natural resources, yet over the past two decades the agricultural sector has, as indeed has the whole economy, performed poorly. The consequential scarcity of foreign exchange has impinged upon industrial production, greatly dependent upon the import of raw materials and spare parts. Yet while the government has been keen to identify extraneous macroeconomic issues as the underlying causes of economic stagnation (Maghimbi 1990), many critics of Tanzania's socialist ideology have focused upon the institutional reforms implicit in the development of Tanzania's socialist ideology, which, it may be argued, have served as disincentives to rural producers and constrained growth in the country's agricultural sector. Furthermore, Bratton (1990) adds that while most analyses have addressed issues at the macro level, the affects of local institutional reforms on small-scale organisations have generally been overlooked.

In light of such criticisms this paper will examine the scope, nature and evolution of contemporary village-level organisations which contribute to the country's institutional pluralism (Hyden 1990), a pluralism, it is here contested, attributable to two factors. Firstly, since long before the establishment of colonial administration, rural Tanzanian peasantry has demonstrated an inherent capacity, through customary self-help organisations, to engage in activities which necessitate collective activity, whether that activity be the maintenance of law and order (Abrahams 1965) or, as has been more common, agricultural tasks such as cultivation and harvesting. Such 'informal' or traditional forms of local organisation are examined in the following section, focusing particularly upon traditional indigenous irrigation organisations amongst which the concept of popular participation has been well documented. Irrigation development has been recognised as having great potential to contribute towards increased agricultural productivity, and recent research (most notably that by Burra and van den Heuvel 1987a, 1987b) has drawn attention to the prevalence and productivity of traditional small-scale irrigation systems in the country. The very essence of grass-roots 'self-help' co-operation which has historically underpinned rural society in Tanzania is exemplified by the structure and role of indigenous irrigation communities, many of which have been subject to anthropological studies as reviewed below.

An understanding of the second contributory factor towards the aforementioned institutional pluralism in Tanzania, a phenomenon Hyden attributes to the "great institutional adaptability that exists at the local level in Africa" (1990: 305), necessitates recourse to three decades of independent government policy, which while having been subject to monumental ideological shifts, has retained its primary objective of economic development based upon increased agricultural production. Keen to nurture broad popular participation in both communal agricultural production and village administration during the formative years of independent government, considerable restructuring of local institutions ensued. Miller (1970) contests

that, "To gain participation, new political structures must be built at the rural level and old institutions must be changed to fit in with national goals" (: 548). The author adds, "The concept of mass participation presupposes a population shift from a disinterested mass to a participating citizenry" (: 548). The manifestation of this hypothesis represented a principal objective of both colonial administration and President Julius Nyerere's independent government, and that village organisations should be allied to a political hierarchy, thereby ensuring political stability and popular participation in local development, heralded, in many villages, the demise (though not the abolition) of the traditional form of voluntaristic co-operation. Consequently, Abrahams (1989) contends that the State, whether in the form of chiefships, colonial authority or in its post independence guise has "co-existed with and overlain a village level of political and legal organisation and know-how" (: 356).

Following examination of Tanzania's self-help ideology and its exemplification in traditional irrigation organisation, this paper will review the socio-political policies since independence and assess their manifestation in terms of the scope and nature of local organisations in Tanzania. The extent to which indigenous forms of irrigation organisation have been absorbed within the formalised village management structure will be discussed before concentrating on the provision of rural water supplies, for which, as will be seen, too often both customary and formal local organisations have been bypassed by donor agencies, the main source of finance for the sector. The final section will return to the question of traditional irrigation in Tanzania. Recent history has demonstrated the necessity of adopting a holistic approach towards irrigation development, particularly in view of increasing rates of deforestation and soil erosion in many regions. The institutionalisation of the self-help ideology to encompass broader dimensions of natural resource management, it is argued, is imperative, yet whether the state, village or non-governmental organisations should provide this multi-function role is a debated issue.

Popular participation in Tanzania

Popular participation, as a development and survival strategy is long-established in rural Tanzania. In terms of agricultural production, polygamy and the "work/beer party tradition" have conventionally been the most important institutions for labour recruitment (Bryceson 1988). Grant, for example, while travelling through the district of Ukuni some 130 years ago writes, "The women on the 3d June were clipping with a knife the tops of the sorghum, putting them into a basket, and carrying the whole on their heads to the village, where the grain, after being thoroughly sun-dried, was thrashed out by lines of men with long handed rackets....They sang and beat the grain chorus, winnowed it in the S.E. breeze, divided it into shares, and by the 1st of July all was housed for the year (1864: 86). Omari (1992) also reports that such communally performed activities to secure and facilitate the procurement of water amongst the Pare, for example, have been undertaken since 'time immemorial'.

With considerable cultural heterogeneity in a society comprising 120 tribal groups, many of which are locally integrated, it is not possible to define a unifying principle of social relationship upon which such co-operative activities have been based. Abrahams (1965) from his study of the Wanyamwezi, the second largest ethnic group, identified five tenets upon which discreet organisations were founded (chiefdom citizenship, neighbourhood, kinship and affinity, domestic grouping and secret societies) each involved in separate functions. Chiefdom citizenship, defined by geographical boundaries, provided a relationship with central

government through a hierarchical structure of superordinate-subordinate relationships, a structure established by colonial administrations and based upon traditional tribal polity. That the state, however, in its various guises since pre colonialism, has overlain an organisational structure based upon egalitarian, informal relationships is well exemplified by the Wanyamwezi, amongst whom such tasks as house building, the resolution of disputes through informal neighbourhood courts, as well as communal cultivation and threshing, have traditionally been organised amongst neighbourhood groups (Abrahams 1965).

Prior to the establishment of colonial rule, however, when tribal agrarian economies interacted, economically, through long distance trade in commodities such as salt, copal and ivory (Bryceson 1990), lineage represented the basic unit of social organisation. While increasing emphasis on agricultural production rather than hunting and gathering resulted in the 'domestic group' assuming the functions of a "distinct food-producing, food-owning, and child-rearing unit" (Abrahams 1965: 171), kinship relations continued to determine co-operative organisational groups, engaged in extra-domestic activities, amongst many tribes, most notably amongst the Wachagga of Kilimanjaro (as discussed below).

The well established ideology of communal participation was recognised by the firstly German, and later British colonialists, who exploited both the established 'formal' hierarchical organisational structure and the multifarious 'informal' institutions. The latter provided a means by which labour could be readily mobilised in order to engage communities in collective work to undertake construction of roads and houses for colonial authorities. Amongst the Pare, Omari recounts, "on the day set out for the *mutharagambo* [collective work], mainly Monday, a local bugle made of animal horn would be blown and every male in the village was supposed to assemble at the appropriate place for the *mutharagambo* activities. Unless one was sick..a fine was imposed on anyone who absented himself" (1992: 4). Under British administration collective self-help activities were employed in community development programmes, the building of schools, for example, was prioritised. The abolition of chieftainship, and the establishment of formal government party representation at village level, after independence, is addressed in a following section. How informal village organisations have traditionally been manifest in irrigated agriculture is first examined below.

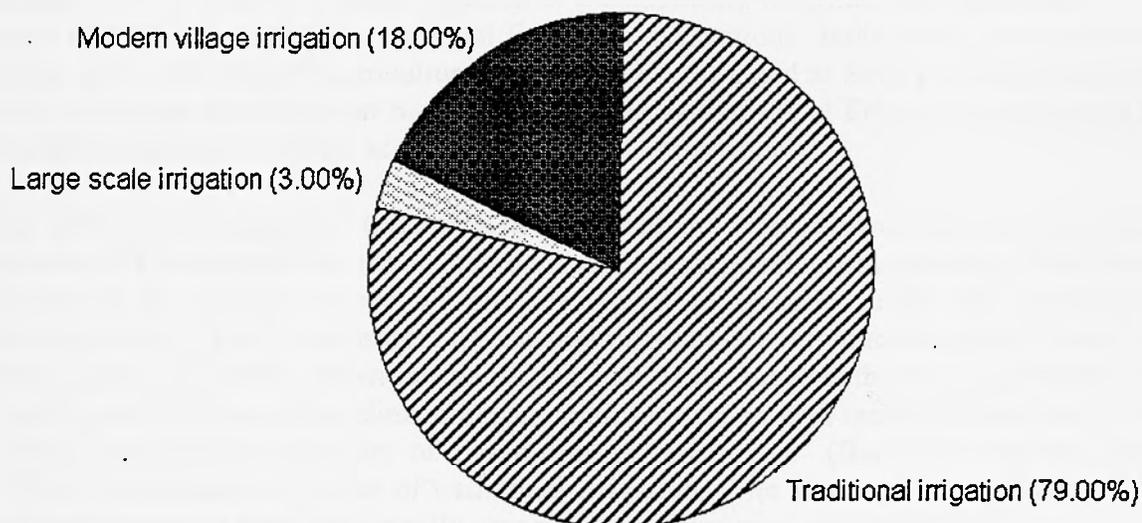
Traditional irrigation and social organisation

Despite a marked climatic seasonality, less than 3 percent of the cultivated area in Tanzania is under irrigation, although a further 850 000 ha have been identified as having 'immediate potential for irrigation development' (Mrema 1984). Three organisational typologies can be identified, traditional small-holder irrigation, modern small holder/village irrigation schemes and large-scale irrigated/private/public farms. The centrality of small holder production, and the relative importance of traditional irrigation systems is illustrated by the statistic that they represent 79 percent of all irrigated land in Tanzania, as represented below (figure 1)

Government assistance in traditional irrigation can be dated to 1935 when the Agricultural Department undertook rehabilitation and improvement of furrows in Tanga, Kilimanjaro and Arusha Regions (Burra and van den Heuvel 1987a) and later the construction of rice dams in Western Province in co-operation with the Native Authorities, utilising local labour on a self-help basis. Both the social and physical aspects of traditional irrigation have remained within the domain of the Agricultural Division of the Department of Agriculture (as opposed

to the Irrigation Division, see below) whose approach, suggest the authors, has been much influenced by their daily contact with local populations through district-level local representation.

Figure 1: Irrigation typologies in Tanzania



Government involvement in the irrigation sector has, however, disproportionately favoured large scale and modern village developments since the establishment of the Water Development Department in the 1950s, a body which has assumed a plethora of different identities and been affiliated to several Ministries since its inception. The Irrigation Division has, since 1975, been accommodated in the Ministry of Agriculture and has been preoccupied with large scale developments and modern village schemes (intended to relieve pressures on traditionally irrigated areas) which together have absorbed a considerable proportion of central funding. Between 1952 and 1970 only 10 percent of finances directed towards irrigation development were allocated to traditional systems. Initial attempts to introduce a "wholly new concept" in irrigation (*ibid.*) met with little enthusiasm however, indeed the Konga and Mvuha Irrigation Schemes (the latter proposed by FAO) were shelved due to an absence of local support. Furthermore, modern village irrigation schemes which have been established have proved financially burdensome, those at Mlali, Kalenga and Mombo still rely on government funding more than three decades after their construction. Despite considerable planning by FAO and foreign private consultants, of the over 850,000 ha of potentially irrigable land surveyed since 1952, only approximately 2 percent is at present under large scale irrigation (Burra and van den Heuvel 1987b).

Burra (1990) suggests the most fundamental constraint on the formulation of a successful irrigation development policy has been the fact that technical and organisational aspects have remained the concerns of quite separate bodies (the Irrigation and Agricultural Divisions respectively) and irrigation development has adopted a distinctly technical bias. Yet the very

fact that traditional social and physical irrigation systems contribute considerably more in terms of both subsistence and commercial production suggests that they warrant greater interest and investment than has been the case during recent decades.

The antiquity of indigenous irrigation in Tanzania is evident by the well documented archaeological remains at the Late Iron Age settlement of Engaruka, in the northern Tanzanian Rift Valley (Sutton 1978, 1986, 1989). The integration of stall-fed cattle into the productive system, through the use of manure, is thought to have been conducive, if not essential, for the sustainability of a system which operated in a climatically marginal environment until c1700 AD. Carbonised sorghum seeds from Engaruka excavations indicate the predominance of this crop in early irrigated agriculture (Robertshaw 1986), and as Sutton (1989) has observed, with an annual rainfall of no more than 350 mm settlement at Engaruka would have been "uncontemplatable" without access to an assured water supply.

The diversity of indigenous technologies employed and crops grown in traditional irrigation systems in Tanzania reflects the equally diverse climatological, geomorphological and cultural nature of the country, hence all are specialised to specific social and environmental circumstances. The Wanyamwezi of Kahama district were introduced to rice by Arab slave traders and was widely grown by the second half of the nineteenth century (Roberts 1968). Again, given the prevailing climatological conditions (in an area receiving less than 450 mm rainfall annually), "the quality of rice output is remarkable" (Burra and van den Heuvel 1987a) and testament to value of traditional irrigation. The Wasangu, Wanyakyusa and the Wabena have also been traditionally associated with irrigated rice production.

The Wameru, by contrast had settled on the slopes of Mount Meru between 300 and 400 years ago and developed a mixed production system based upon the cultivation of beans and the keeping of cattle, sheep and goats (Burra and van den Heuvel 1987a). By the advent of the twentieth century, however, irrigation was extensive and the economic basis of the tribe revolved around trade in irrigated maize, sweet potato, pumpkin and bean seed with the neighbouring Wa-Arusha. One may also assume that the Wachagga of Mount Kilimanjaro, from who the Wameru adopted their irrigation culture, would have been less dependent upon access to perennial water sources given the high rainfall on the upper slopes, although Burra and van den Heuvel (1987a) report that irrigation furrows supplied 90 percent of water requirements of the vegetables grown. The introduction of coffee in Northern Tanzania, a factor influential in the expansion of hill-furrow irrigation on West Kilimanjaro, greatly influenced the productive character of many irrigation systems, including that of the Wachagga. The newly-realised economic potential of irrigated agriculture also stimulated the expansion of the Shambaa hill-furrow system in the Usambara Mountains. The Shambaa had constructed an extensive system to facilitate banana production prior to the introduction of coffee in 1929 (Feierman 1968). Similarly the former subsistence basis of irrigated maize and bean production amongst the Wamatengo of Mbinga District was replaced by intensive coffee production upon its introduction during the same decade.

Falling producer prices for export crops have, however, since independence, discouraged coffee production (the principal traditionally irrigated cash crop). In 1974 oil prices were 350 percent higher than in the previous year, and the Tanzanian fuel import bill escalated by TSh 200 million (Bryceson 1988), raising transport costs significantly. Institutional constraints on marketing during this period also contributed, in many instances, to a reversion to food self-

sufficiency, matched by a concurrent contraction of traditional irrigation based on cash crop production. The total number of furrows on Kilimanjaro, for example, fell from 1000 in 1962 to 500 in 1986, in part (though not solely) due to producer price disincentives (Grove 1993).

During recent years, however, the potential profitability of vegetable production has rejuvenated the economic capacity of traditional irrigation. Grove (1993) reports of plans to rehabilitate abandoned irrigation furrows on Kilimanjaro so that vegetable production can be intensified. A twice weekly market in each village and the proximity of wage-paid urban labour opportunities have attracted wide interest in vegetable production. The traditional systems in Lushoto, Korogwe, Dabaga, Lumuma, Mgeta, Usagara, Kilimanjaro and Meru supply more than 90 percent of vegetables to markets in Dar es Salaam, Moshi, Tanga and Morogoro (SNV 1992), testament to the foremost importance of indigenous technology and organisation. It should be noted, however, that changes to the productive character of irrigating societies has not necessarily been motivated by economic criteria, the Wasonjo have never engaged in commercial agriculture, yet Adams et al (forthcoming) report that, "there has been considerable development of the crop repertoire of the Sonjo since the 1950s" (: 26), primarily due to the introduction of banana, maize, cabbage, lettuce, tomatoes, tobacco and papaya by church workers and younger villagers who have ventured out of the remote Sonjo villages in the far north of the country. A detailed inventory of traditional irrigation systems, including information on the predominant crops grown has been compiled by Burra and van den Heuvel (1987b).

While a number of analogies may be drawn between irrigation communities in the country, particularly in terms of technologies employed, a closer examination of the forms of social relationships upon which irrigation communities have traditionally been based suggests that, in this respect, there has been a degree of divergence. The division of labour provides an apposite example. While amongst the Wasagara and Waluguru cultivation is undertaken by both men and women, among the Wa-Arusha and Wameru women alone undertake such work. Furrow construction has in many tribes been undertaken by both sexes, although amongst the Wapare construction of dams has traditionally been considered 'unsuitable' for women (Omari 1992). In order to exemplify the organisational diversity amongst traditional irrigating communities, three systems are examined in detail below.

The Wachagga of Kilimanjaro are the most well documented tribal group involved in traditional irrigation, indeed the Districts of Moshi and Hai are the most well endowed with irrigation furrows in Tanzania (Burra and van den Heuvel 1987b). Pike (1965) has remarked, "there are probably not many areas in the world with a more highly developed, complex and successful system of irrigation" (: 95). Water management (irrigation furrows traditionally served both agricultural and domestic purposes) has conventionally been based upon the principle that whoever originally built a furrow acquired its ownership, a task traditionally undertaken by kinship groups, resident in the locality. Consequently, organisational structures were based upon lineage, and ultimate authority over each furrow was held by the head of the lineage, 'the owner'. The status of owner subsumed the authority to organise all work connected with the building and maintenance of the furrow as well as inherited religious responsibilities involving sacrificial offerings to appease spiritual powers (Raum unpublished). The kinship group was not necessarily restricted to domestic grouping, often several homesteads would share water resources, united through a more remote kinship group and

affiliated through clan ties. In such cases ownership was inherited by the senior member of the core lineage descended from the original builder (Masao 1974).

The strength of the clan-oriented social organisation system is evident in the divisions of labour which developed amongst the Wachagga. Certain clans, for example, specialised in cattle or bee-keeping (the *Wamasi'*) while the *Wako-Makundi* in Mamba were a smithy clan. *Mfongo*, specialists in the art of irrigation, would provide the expertise for other clans. In Kibongoto, for example, one clan constructed irrigation furrows on behalf of all others in the chiefdom (Masao 1974). In such instances, while technical responsibilities were conferred upon members of specialised clans, ritual and spiritual responsibilities remain with the lineal headman.

The irrigation community, here, is therefore most often a discrete kinship unit, although even within the Wachagga a degree of organisational diversity has for long been evident. In isolated cases, as Masao (1974) reports, access to irrigation water was not strictly dependent upon clan membership, but achieved through association to a local furrow board. The irrigation community would then be defined by a discreet geographical area rather than by kinship associations, and membership could be achieved through payment of a prescribed contribution. Furrow board elders would, in these instances, possess authority and responsibility for mobilising members for maintenance and furrow cleaning duties. The clan, however, provided the institutional framework for mutual aid and dispute settlement, and thus provided a sound basis for the development of informal organisations. Disputes between clans motivated the formation of alliances, and in turn provided the basis for the evolution of centralised chiefdoms. Chiefs were able to call up statutory labour to undertake construction of new furrows (men), weeding and hoeing of fields (women) and the gathering of materials for construction of their residences (youths). This 'formal' structure overlaid, but did not replace the traditional kinship based organisational structure. Clan ownership of irrigation structures and management of water resources has also commonly been associated with other long established systems, most notably those of the neighbouring Wameru and Wapare.

One of the most comprehensive anthropological studies to have been undertaken in Tanzania is that by Gray (1963) who examined in detail the social structure amongst the Wasonjo of Northern Tanzania. This irrigation system also bares evidence of great antiquity. Fosbrooke (1938) writes of the "striking similarity" (: 58) between the ruins near Sonjo villages and archaeological findings at Engaruka, 80 km south east. Evidence of former irrigation canals suggests that Sonjo irrigation dates to time when the Engaruka complex, which extended as far south as Lakes Eyasi and Manyara in the seventeenth century, was operative (Sutton 1989).

A complex social structure, developed primarily in response to the threat of attack from the neighbouring Masaai, underpins the broad division of duties amongst the Wasonjo. Male villagers belong to either the *vijori* (between birth and the ceremony of circumcision), *batana* (initiated warriors) or *bamalankolo* (elders). The *batana*, originally excluded from economic activity, were traditionally primarily responsible for defence and security, although ensuring compliance with judgements made by the ruling council also gave them political influence in the villages. Within each village, discreet areas demarcate residence of a particular clan, and, analogous to Wachagga social organisation, clan membership is instrumental in

determining social and political power. Within each village ultimate political authority is traditionally held by a 17 man council of village elders (*wenamiji*) who acquire their positions through patrilineal hereditary rights. Only those related to the founding clans in each village are represented on this traditional village council. The *wenamiji* were traditionally the only group exercising political authority such was the strength of the indigenous organisational structure, one of their responsibilities, reports Gray (1963) was to "plan and direct the whole system of irrigation with a view to utilising the water with maximum efficiency" (: 59). Maintenance of canals and furrows was organised within each village by the *wenamiji* and young men were mobilised to undertake the bulk of the work, although village elders contributed where the tasks were less demanding (Adams *et al* forthcoming). The *wenamiji* possessed authority to impose sanctions if members of the community failed to participate in the obligatory tasks of maintenance and repair, and could expel individuals in the most extreme cases.

A particularly unique system pertaining to water rights (insofar as such a system has not been reported from elsewhere in Tanzania) is described by Gray (1963). The *wenamiji* allocate themselves the first irrigation periods (each lasting six hours) in each irrigation cycle. After approximately four days, a group of eighteen men, the *wenamiji barirage*, also holders of hereditary rights to water, are provided their allocations. The third in line are a group of elders, *wakiama*, who possess no hereditary rights but, "obtain temporary rights through paying tribute to the *wenamiji*" (: 59). Access to irrigation water may be purchased by the *wakiama* (with goats or grain) despite the absence of any automatic rights. The remaining villagers, however, must apply for secondary rights to those with primary rights.

A further indication of Tanzania's 'institutional pluralism' identified by Hyden (1990) is provided by anthropological research undertaken in Mto wa Mbu, in Arusha Region. Kinship relations are considerably less significant here due to the diverse ethnic, cultural and religious diversity amongst the areas 13 000 inhabitants (Arens and Arens 1978), a consequence of high immigration rates during recent decades. Less than 6 percent of heads of households were actually born in Mto wa Mbu (Martens 1991). While over 70 tribal groups are represented in the area (Arens 1973), a "strong sense of community identity and solidarity on the part of the residents" (: 443) is evident both on ritual occasions (marriages and funeral ceremonies) and in co-operative participation in certain productive activities.

In contrast to the basis of most traditional irrigating communities, and despite the ethnic heterogeneity of the area, ethnicity "is not a relevant aspect of community social organisation" Arens and Arens report (1978: 152). Indeed, the authors conclude that co-operation between representatives of over seventy different tribal groups is a prerequisite for economic and social welfare in a community dependent upon irrigated agriculture. That local organisation is founded upon neighbourhood relationships is a matter of practicality and succeeds in suppressing any potential ethnic friction. Residents of the area have practised irrigated agriculture since it was first settled in 1920, as the population grew water distribution and system maintenance organisation developed according to geographically defined areas, irrespective of ethnic constitution. Rights to water evolved to be based on seniority, while conflict resolution was achieved by consensus and 'coalescence' amongst the community in order to maintain conformity with the code of conduct (Arens 1973).

The insignificance of tribalism in social organisation is manifest by the degree of co-operation in maintenance and operation of the irrigation network, each immigrant is dependent on his neighbours for their collective rewards from an agricultural systems yielding greater potential than agriculture in their former homeland (Arens 1973). Indeed, when questioned the inhabitants of Mto wa Mbu identified themselves not in terms of their ethnic lineage but as Waswahili, indicative of the fact that their common language represented a basis for a new homogenous ethnic identity. It is of interest to note that of the represented tribal groups, only Wachagga have shown any inclination to preserve their ethnic identity, primarily, Arens suggests, in order to facilitate their economic ambitions, a reflection of the entrepreneurial tendencies developed through cash crop production on the slopes of Kilimanjaro.

The decay of autonomy amongst the traditional irrigation communities, engendered by colonial intervention in traditional tribal organisations resulted in a decline in the extent and effectiveness of many indigenous systems. Arens (1973) for example reports that the role of arbitrator in issues of dispute amongst irrigators was conferred upon a British appointed village headman, replacing the indigenous system described above. The nature of local organisations involved in irrigation management, and village administration in general is, however, very much a manifestation of post independence socio-political ideology and three decades of institutional reform. The following section will review these changes and examine the consequences before returning to the irrigation organisations described above to assess how robust they have proved in wake of institutional formalisation.

Post-independence local institutional reform

In the wake of Tanzania's post independence commitment to socialism and self-reliance a number of institutional reforms have been implemented and many indigenous organisations have been formalised. This section will review the manifestations of this political ideology in terms of the functional reorganisation of local institutions.

While primarily concerned here with village-level reforms, it is worthwhile first placing them in context with the broader dimensions of local government changes in Tanzania, conventionally analysed in terms of three distinct historical periods ; pre-1972, 1972 to 1982 and post 1982 (Mutizwa-Mangiza 1990). After independence in 1961, Tanzania inherited the British style local government structure, where rural local government was bestowed upon district councils (having replaced the colonial native authority councils) who acquired responsibilities for rural water supplies in addition to other social welfare sectors including rural health care and education. In view of the financial insecurity being experienced by district authorities due primarily to the demands placed upon their resources by both the evolving Tanganyika African Nationalist Union (TANU) village authorities and the then thriving co-operative system, and in order to facilitate the pursuit of development based upon Nyerere's philosophy of socialism, elected district authorities were abolished during the "decentralisation" period (1972-1982). A four tier deconcentrated system of local government was established in 1972, represented locally by the Village Assembly and elected Village Council.

As Mutizwa-Mangiza (1990) notes, the village authority structure was of great significance in terms of Nyerere's vision of collectivity and self-sufficiency in village based development. As discussed below, the objective of improved welfare, improved access to social services

including schools, health centres, roads and water supplies in addition to the economic benefits attainable through popular participation in both agricultural and non-agricultural village enterprises motivated the creation of nucleated *ujamaa* villages. Decentralisation failed to achieve either the economic or social objectives. As the author points out, decentralisation was little more than administrative reform aimed at "concentrating the allocation of resources to single authorities at each level" (: 25). This top-down approach resulted in a reduced willingness to participate in the collective rural development based upon socialism and self-reliance which the reforms were intended to facilitate.

Hence in 1982, district councils were reintroduced in advisory/technical support capacities while the local village authority structure remained very much as before, designed to encourage (or exploit) popular participation. The local government hierarchy since 1982 has therefore been represented by;

- Regional Development Committee (co-ordinative and consultative only)
- District Development Committee (advising on development programmes and projects)
- Ward Development Committee (to plan and implement development under supervision of district council)
- Village Assembly (made up of all villagers) and Village Council (elected).

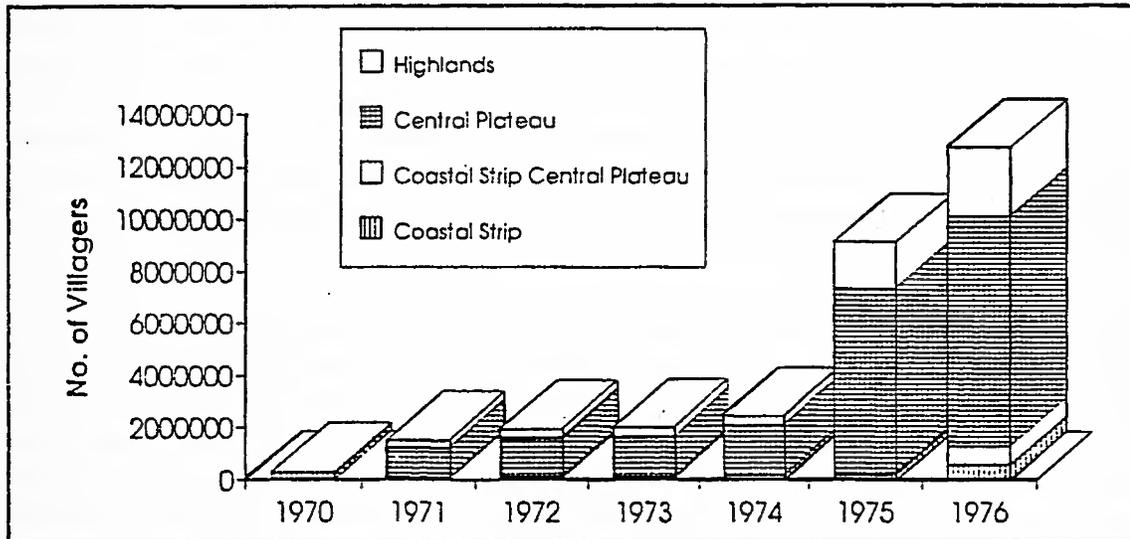
In pursuit of a post independence development strategy aimed at unifying the ethnically heterogeneous national community, Tanzania adopted a one-party system (established in 1965) which necessitated uniting all major national institutions, including peasant's organisations within a single party in an attempt to "foster national unity" (Mushi 1981: 142). In terms of the institutional basis of village organisation, however, the most momentous event was the Arusha Declaration of 1967 in which President Nyerere's policy for rural development based upon the values of socialism and self reliance were articulated. "We shall become a socialist, self-reliant society through our growth...Our change will..be effected almost entirely by the emphasis of our new development and the gradual conversion of existing institutions into others more in accordance with our philosophy" (Nyerere 1967 quoted in Mushi 1981: 165/166). Popular participation was to be a central theme of the socialism and self-reliance doctrine and *ujamaa* villages were to be the loci of this ideology.

In September 1967, Nyerere called for "rural economic and social communities where people live together and work together for the good of all" (quoted in Dumont and Mottin 1983: 109), the principal objective of the ensuing villagisation programme being to establish rural socialist, egalitarian self-ruled and self sufficient small village (*vijiji*) communities (Mbawala 1979), organised to the extent that each *kijiji* would comprise a number of ten-house cells, each with an elected cell leader (*kiongozi wa shina*). The extent of the programme is indicated by the statistics that in 1970, 531,000 people representing less than 5 percent of the total population were living in 1956 villages with an average occupancy of 271 inhabitants. At the culmination of Operation Tanzania in 1977, 79 percent of the population resided in 7300 villages with an occupancy of 1850 (Yeager 1989), see figure 2 below.

The organisation of agricultural production was to be based upon co-operation, whereby rural farmers would, "live together in a village... farm together and undertake the provision of local services and small local requirements as a community" (Nyerere, 1968 quoted in Moshi 1992: 63/64). Despite initial enthusiasm for the policy encouraging voluntary compliance, the fact

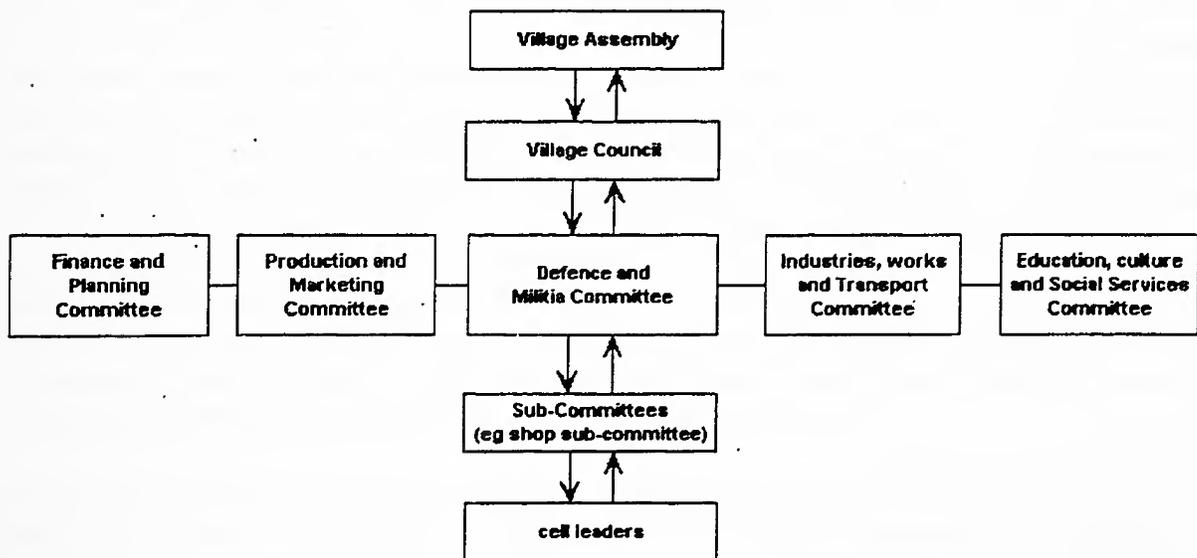
that by June 1971 only 6.3 percent of the population were living in village communities provoked a coercive approach, commencing with Operation Dodoma during which 30, 000 families were compulsorily villagised during a six month period.

Figure 2: Villagisation in Tanzania



The Villages and Ujamaa Villages Act, 1975 dictated the organisational structure to be adopted by registered villages, as is represented diagrammatically below (figure 3). The village government is, in theory 25 person committee (based upon the assumption that each village should consist of 250 households, enabling each cell to be represented on village government. In reality, modifications to this structure have often occurred (see for example Hyden 1990).

Figure 3: Village political and administrative structure



Peasant co-operative organisations, prior their abolition in 1976, were primarily marketing organisations but viewed as serving capitalist objectives, and seen as alien to the spirit of socialism Nyerere was encouraging in the villages. The Second Five Year Development Plan provided for traditional peasant co-operatives (examined in detail below) to become production oriented, a policy in which communal farming was an integral component. Each village was consequently registered as a 'multi-purpose' co-operative and formal village authorities assumed the roles previously undertaken by peasant co-operatives. As will be seen below, both the coercive nature in which the reforms were implemented and the false assumption that the Tanzanian peasantry's readiness to co-operate would extend to collective ownership of agricultural produce at the expense of the customary individualistic mode of production proved self-defeating. As Omari (1992) remarks, "somehow during the villagisation period of the 1970s the mood of the masses to participate in self-help programmes in the country died." (: 9).

That compulsion to engage in communal activities was liable to yield poorer results than activities initiated and administered by peasant farmers themselves is exemplified by Caplan (1992). Issues that villagers expressed interest in as potential self-help ventures, particularly road repairs and improvements to water supplies, were ignored by government officers, represented at village level by the Village Executive Officer (the local cog in the government machinery) who preferentially encouraged communal cotton growing and coconut plantation cleaning, "...visiting government officials tried to convince the villagers that this was a worthwhile venture. The villagers resisted - they argued that it was a labour intensive crop whose peaks coincided with peak labour demand for food crops. Basically, they were not interested in communal cultivation" (: 109). Mushi (1981) provides further evidence of the reluctance to voluntarily participate in communal production. In all seven Ujamaa villages studied by the author, individualistic rather than a communal mode of production was found to be dominant, leading Mushi to comment that, "The emphasis on individual farming in these villages suggests that the traditional spirit of co-operation which existed under situations of subsistence and insecurity cannot be considered the pillar of socialist reconstruction (1981: 171).

Not that such a rejection of communality was invariably the case. Mushi, (1981) describes local organisation amongst villages in Morogoro District, where the spirit of *ujamaa* is (was) more evident than in many contemporaneous accounts. At Kidudwe, Mondays were set aside for 'nation-building' activities (maintenance of roads, dispensary etc.) while a further three days each week were devoted to communal work, primarily on sugar-cane fields. The author contrasts this village with another in the district, Lukenge, where *ujamaa* has weakened and production has reverted to its former individualistic form. Co-operation in the latter case was restricted to bloc farming whereby ploughing and spraying were undertaken jointly by farmers owning contiguous fields, ownership of the produce remained, importantly, with the individual farmer. It is somewhat paradoxical, the author suggests, that villagers only persevered in communal production due to government support, and despite a tradition of self-help activity in Kidudwe, Party involvement has precipitated an erosion of self-reliance, the very concept village institutional reform was designed to nurture. (Mushi 1981).

It is clear that few generalisations can be drawn concerning the relative importance of formal local organisation and indigenous 'home grown' institutions in Tanzania. This point is exemplified by Hyden (1990) in his assessment of local institutions involved in food

production in Iringa District. Official institutions play a major role in the productive activities in the village of Mung'elenge, for example, where in addition to the revenue raised by the village government from sales from the village shop and sand quarry, both the Union of Women of Tanzania (UWT) and Vijana (the official youth organisation of the party) were active in agriculture-related revenue raising activities. The latter manage the 50 ha village farm and supplement their income by renting out oxen. Hyden contrasts the roles of official institutions in Mung'elenge with those in the village of Bulungura, where formal village enterprise is constrained by a lack of revenue (primarily due to the district council retaining much of the revenue raised in the village for administrative purposes). Of the informal institutions identified by Hyden, women's associations are responsible for water collection (and maintenance of the water sources) and food security, the latter involving the communal cultivation of land to supplement production on the homestead shamba. In contrast, and indicative of a more general distinction which can be made between formal and informal local organisations, in Mung'elenge, the communal farm represents a business venture rather than a measure conceived to maximise food security. Hyden suggests that such case studies illustrate the value of local development, where two contrasting 'coping strategies' are founded upon greatly contrasting models of local organisation, suggesting also that the scope and nature of local organisations in Tanzania is "much more diverse than typically assumed" (Hyden 1990: 305).

A relevant observation is made by Bryceson (1988) who reminds us that the 'guiding principle of social organisation' in Tanzania has historically been the household-based production of sufficient food for year round supply. This is of great significance when contrasting post- and pre-*ujamaa* attitudes towards communal production when communal labour was regarded as an addition rather than a compulsory alternative to household production. However in terms of non-agricultural economic enterprises, the creation of villages as corporate units, each with their own local level government structure, has proved more successful. As multi-purpose co-operatives villages engage in a diversity of economic enterprises, for which they may apply for loans. A fundamental difference between *ujamaa* activities such as those described here, however, and the customary nature of self-help co-operative activities, is that the former are both involuntary - in that projects are imposed on villagers - and financial returns from such ventures are credited to the village rather than to the villagers. In view of the priority accorded to household food security, it may not be surprising that village enterprises characterised by lower labour demands have proven more successful. The village of Mchinga II, for example, illustrates this appositely. While agricultural production has reverted to the traditional individualistic mode, the principal income generating village enterprises; the village shop (started in June 1976), the village lorry (part funded by a loan from the National Bank of Commerce) and village fishing enterprises have attracted a greater degree of interest and proven considerably more successful (Hassett 1985).

In view of the inability of village governments to incorporate the peasant farmer in the formal village structure, agricultural policy since 1983 has placed greater emphasis on the role of the homestead rather than communal village farm. It is also proposed to establish legal security of tenure for small holders to act as a further incentive (Rugumisa 1990). Such developments reflect a significant change in policy away from institutional reform towards pricing and marketing reforms, reflecting the objectives of the Structural Adjustment Programme, drawn up in 1982 in which the small holder was identified as, "central to agricultural revival" (Rugumisa 1990: 74). That the concept of self-help should continue to underpin local

development is articulated in the subsequent Economic and Social Action Programme 1989-1992 (Therkildsen and Semboja 1992).

Restructuring of rural government and the villagisation programme have together bestowed upon villagers a certain amount of autonomy and facilitated the provision of certain social and welfare services. The provision of health care and education represent the more positive consequences. Furthermore, accessibility to 'safe' water supplies has also significantly improved. As President Mwinyi observed in December 1986, "In 1961 only about 11 percent had access to clean water. Today it is estimated that over ten million people or just under 50 percent of the population have access to clean water within 400 metres of their homes" (quoted in Caplan 1992: 115). However, despite the egalitarian objectives of two decades of socialism and self reliance, inequalities in prosperity have widened, most markedly in respect to gender. Men have reaped the benefits of increased income, access to education and health care far more than women (Caplan 1989). Furthermore women are not represented on village government, their involvement in party organisation being through the bureaucratic UWT. Caplan (1992) in her account of socio-political and institutional changes in the village of Kanga over three decades, observes that here the role of the UWT has been primarily concerned with encouraging communal production (despite the fact that women have sole responsibility for subsistence agriculture) while men folk reap the benefits of capital rather than labour intensive village enterprises, in this instance the village lorry project.

Local institutional reform and the provision of agricultural services.

In order to prevent Asian traders financially exploiting links between the country and European trading companies, peasant co-operatives were legalised in 1932 by the Co-operative Societies Ordinance. The role of marketing co-operatives may be identified as one of the most important factors responsible for continued growth in agricultural productivity during the 1950s and 1960s, as marketing and supply agencies they played a considerable role in the success of Tanzanian agricultural development (Maghimbi 1990). Tanzania's first co-operative union was the Kilimanjaro Native Co-operative Union (KNCU), which, together with its 11 affiliated primary societies, was registered on 1 January 1923. Masao (1974) associates the strength of the clan-oriented social organisation system with the success of the peasants co-operative movement.

With the establishment of the co-operative bodies, supplying cheap farm inputs and providing marketing infrastructure, the number of coffee growers increased from 3 300 in 1924 to 15 000 in 1933 in Moshi District. By 1966 KNCU was marketing 16 730 tons of coffee annually (Maghimbi 1990). During the 1940s and 50s a number of other co-operative unions were registered, and by the 1960s the Victoria Federation of Co-operative Unions, primarily involved in the marketing and ginning of cotton, was the largest co-operative organisation in Africa. By the 1960s, Tanzania boasted the largest co-operative movement in Africa. Maghimbi, contemplating the reason for such success, suggests that while agricultural production has always been fundamentally individualistic, African peasants have also "practiced and cherished co-operation and thus they were in general terms used to the idea and practice of co-operation (1990: 85).

The rate at which primary co-operative societies (the village-level arm of the co-operative marketing structure) multiplied is evident from the table below.

year *primary co-operative societies*

1948	62
1952	172
1953	188
1957	474
1958	546
1959	573
1961	857
1966	1500
1974	2500

from Maghimbi (1992: 221)

By the late 1960s the functions of the primary co-operative societies had broadened, supplied by their respective unions, to provide building materials and a wider range of farm inputs including pesticides and fertilisers.

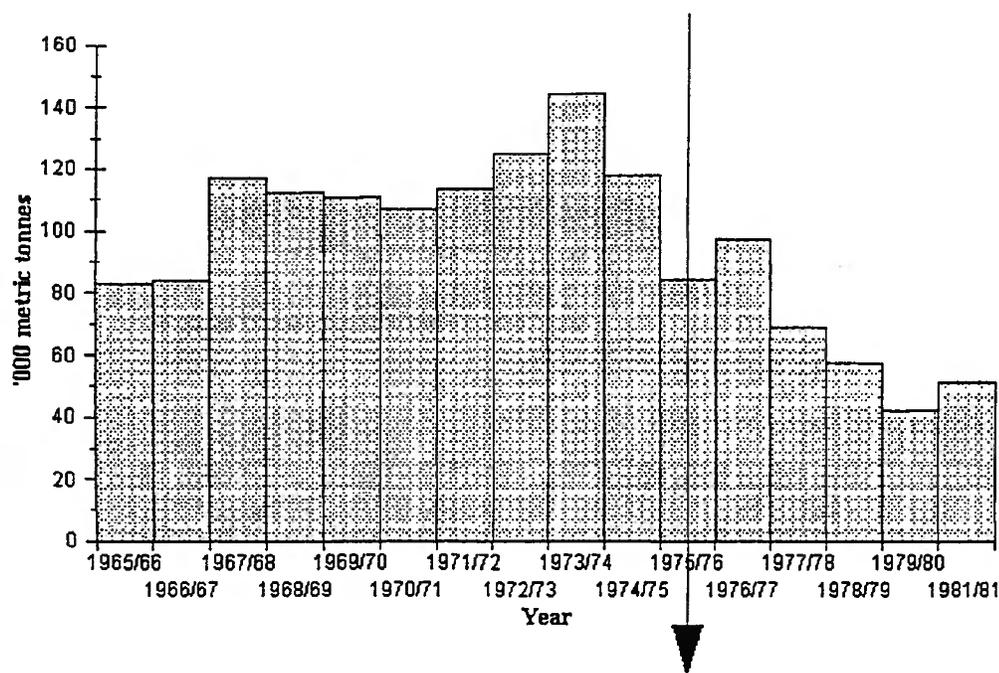
The institutionalisation of 'informal' organisations as had been demanded by Nyerere in 1967 extended to the co-operatives. At village level primary co-operative societies were abolished in favour of central Party control over all rural services. The devolution of peasant co-operatives is illustrated by Maghimbi (1990) who cites the decline of the Ruvuma Development Association (RDA), comprising a number of village co-operative organisations. The 17 villages in RDA were autonomous, and voluntary membership conferred access to a maize mill, a saw mill and a number of tractors. An element within TANU however viewed such local autonomy as a threat to government control over the peasantry and in 1969 RDA was declared a prohibited organisation. Maghimbi (1990) identifies this event as the first of measures taken to dissolve peasant independence and the traditional connotation of co-operative organisation. Compulsory villagisation (1973) and the abolition of co-operative unions and primary co-operative societies (1976) were the main manifestations of this new perspective on rural development. As discussed above, the Village and Ujamaa Villages Act of June 1975 made provision for the strengthening of formal village-level organisation, conferring the designation of multi-purpose co-operatives upon registered villages (Mushi 1981).

The co-operative marketing structure was replaced at village level by village governments who assumed the roles of primary co-operative societies. The general failure of communal village farms to produce sufficient yields to sell to the newly established Crop Authorities (who replaced co-operative unions) resulted in village authorities acting as intermediaries between farmers and Crop Authorities, for which the village collected a commission. Village governments also assumed the roles of agents in the supply of farm inputs and credit from Crop Authorities. The Village Councils were appointed purchasing agents on behalf of parastatal companies, the Village Secretary specifically appointed the responsibility of purchasing from farmers (Nindi 1992).

The crop authority involved in grain (the National Milling Corporation), failed to achieve what co-operative unions had so successfully accomplished prior to their abolition. The services they had assumed responsibility for deteriorated, and in some cases ceased to operate. The abolition of the functions of primary co-operative societies and co-operative unions are

reflected by reductions in production of cashewnuts, as inferred by the quantities marketed between 1965 and 1981 (Figure 4)

Figure 4: Marketed cashewnut production 1965 - 1981, from Maghimbi (1992)



This example illustrates the value of the local primary co-operative societies (serving a few villages at the most) in that the producers were themselves responsible for transportation of crops to the co-operative union for marketing. The author notes that if road conditions prevented the transport of their crops, storage facilities would be built and the roads repaired to facilitate the process. Centralised crop authorities (in this case the Tanzania Cashewnuts Authority) lacked such local resources. Village authorities were unable to motivate farmers to produce more (or even harvest standing crops) doubting whether the crop would be bought.

Co-operative unions and primary co-operative societies were reintroduced in 1982 and have assumed their former responsibilities, however crops are now purchased directly from farmers. They continue to occupy a, "strategic positions in the production-marketing chain" (Moshi 1992: 67), responsible for the provision of inputs (seeds, fertilisers), farming advice, farm implements, credit and the control of produce quality and act as guarantors on behalf of producers for credit. A shortage of foreign exchange has however constrained the supply of fertilisers, agrochemicals and farm equipment (Moshi 1992).

Maghimbi (1990) and Moshi (1992) have expressed concern about party involvement in co-operative administration, particularly in view of the requirement that co-operative managers should be party members hence restricting participation at this level to those with political affiliations, a factor which has partly eroded the spirit of popular participation in the marketing co-operative organisations at village level. Furthermore, that the co-operative unions have been reinstated 'from above' has, in some instances, resulted in the formation of

marketing structures with insufficient resources to undertake the tasks for which they were re-established.

Structural adjustments, enforced by IMF and donor institutions rather than a consequence of political will - although necessitated by declining foreign revenues (Nindi 1992) - have resulted in a reduced role of local formal marketing organisations as the co-operative system, both at local (village) and regional level has become overlain with private trading between surplus and deficit areas. Bryceson (1988) adds, however, that the widening gap between consumer and producer prices prior to the economic reform packages had already led many to sell through parallel markets since the 1960s. In areas some private trade (represented by either direct sale in urban markets by producers, or in villages to traders) has substantially replaced primary co-operative activity (for example Southgate 1993). Nationally, private sector maize trade accounted for 43 percent of total sales in 1980/81, a figure which had increased to 83 percent by 1988 (Santorum and Tibaijuka 1992). Furthermore, regional co-operative unions have, since 1989, been permitted to sell direct to private traders, as opposed to marketing organisations (EIU 1993).

Several factors have been identified as prerequisites for the successful operation of local organisations; autonomy in decision-making, minimal bureaucratic interference, and appropriate incentives. As discussed in the previous section, an absence of such factors has widely been recognised as a constraint on effective irrigation development. Institutional reform designed to strengthen village organisations, as reviewed above, paradoxically served to weaken the traditional spirit of self-reliance and co-operation in agricultural production and fiscal reforms have acquired greater significance in their wake. The degree to which institutional reforms have manifest themselves within traditional irrigation organisations is addressed in the following section, in which recent developments in the three case studies are examined.

Rural development policy and its effects upon traditional irrigation organisation.

In order that traditional systems of irrigation organisation may be readily absorbed into the village administrative structure, provisions were made that within the Village Development Council (comprising members of committees responsible for Finance and Planning, Production and Marketing, Construction and Transport, Education, Culture and Social Welfare and Defence and Security) in villages with traditional irrigation, a separate committee (or sub-committee) would assume all responsibilities for irrigation system management. Burra and van den Heuvel (1987a) suggest that many customary rules and regulations have remained unaffected by the legislation. To examine this contention in greater detail, the three institutionally diverse case studies cited above are re-examined below based upon recent research undertaken in the respective areas.

Grove (1993) has undertaken research in several Chagga villages, and while acknowledging significant variations in the extent and rate at which institutional reforms have impinged upon tradition, she makes the following general observations. Due to the fact that settlements were already nucleated (as necessitated by the very nature of the irrigation system), villagisation involved, in physical terms, little more than delineating existing settlements. Consequently, social relations and traditions remained largely undisturbed. The most significant modification pertains to the Villages and Ujamaa Villages Act of 1975, an outcome of which is that the

functions of clan authorities in the management of furrow irrigation, as described in pre-*ujamaa* accounts of Chagga water management (Pike 1965, Masao 1974), have been replaced by newly created local governments, while village authorities have assumed possession of all main furrows.

Responsibility for management of the irrigation system has been conferred upon the Village Chairman, who has assumed responsibilities traditionally held by hereditary furrow owners, or furrow board leaders. Village authorities have been granted the power to incorporate local rules governing the management of water into the formal legal system through the 1982 Local Government Authority Act which enabled local tribal law to acquire formal by-law status, hence allowing village authorities to retain, and incorporate, traditional rules into the formal legal system. The appointment of a 'Furrow Leader' provides local access to the official local government hierarchy through the furrow council, a body analogous to irrigation committees established in other areas. Village officials, ultimately responsible for decisions concerning irrigation management, as Grove points out, ironically, may have a less detailed knowledge of issues of water management than would the most senior members of the former irrigation community. Representation on the Village council is geographically, rather than hereditarily dictated, whereby an elder male from each 10-house cell is elected to undertake responsibilities of furrow inspection. Such a situation is, of course, facilitated by the fact that here, often, families reside on their irrigated plot, and so the irrigation and general village organisation systems are coterminous.

Maintenance work has been absorbed into village-co-ordinated communal activities, and as such is undertaken once a week alongside other activities such as road repair and, as Grove reports, 'tending village government flower beds'. Nevertheless, the author concludes, despite the assimilation of the clan-based organisational structure, the formalisation has not detracted from the prominence of local participation in the management of irrigation and irrigated agriculture. That responsibilities have remained village based, hence preserving the tradition of local participation in decision making, has ensured that irrigation remains central to the Wachagga's 'relative prosperity'. A similar level of village penetration into indigenous irrigation organisation has also been reported amongst the Wapare communities in Same and Mwangi districts (Burra and van den Heuvel 1987a).

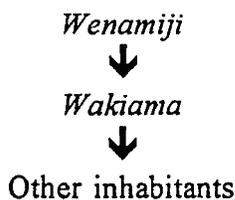
Local government reforms have encroached on Wasonjo traditions with considerably less impact than would appear to be the case above. Potkanski (1987) reports that while the Village and Ujamaa Villages act of 1975 did result in limited (and often only temporary) relocation, *ujamaa* ideology had little effect on irrigation furrow ownership relations. Visible evidence of formal Party involvement in Sonjo village development is restricted to medical dispensaries and schools which have been established in two of the villages. It is of interest to note Potkanski's observations that the economic co-operation encouraged by central government is evident in several Sonjo villages, yet is entirely due to local initiative rather than local government decree. Villagers in Orokhata have raised money to purchase a Toyota truck and a tractor, for example, and other villagers are undertaking similar enterprises.

The *wenamiji* have retained absolute control over irrigation despite occasional attempts by the formal Village Council to involve themselves in water allocation. One of the few modifications to the system detailed by Gray (1963) is that, as a concession by the *wenamiji* to 'the process of modernisation' in one village, the school plot is entitled to water each week

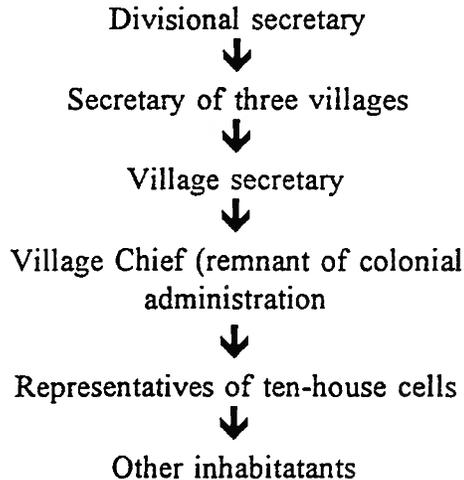
(Potkanski 1987). The explanation for the inability of the Village Council to become as involved in village administration as appears to have been the case in other areas rests upon two characteristics of the Wasonjo people. It may firstly be assumed that the geographical isolation of Sonjo villages, enhanced by a virtually non-existent infrastructure in the area, has contributed to political and socio-economic insularity of the tribe.

Secondly, the strength of Sonjo religion - founded upon faith in the spirit of *Khambageu* who is believed to be able to influence the tribe's welfare, particularly through rainmaking (Gray 1963) - has maintained and protected the *wenamiji's* authoritative role as they, together with a group of 'priests', preside over annual religious rituals and ceremonies. It is interesting to compare the level of 'evangelization' achieved amongst the Wasonjo of whom only 3 percent are Christian (Potkanski 1987) to the Wachagga amongst whom Grove (1993) reports that over 70 percent had been converted to Christianity by 1970. That the Village Council members themselves respect both the Sonjo religion, and therefore the *wenamiji*, has, suggests Adams (personal communication), greatly contributed to the maintenance of the traditional organisational roles of the *wenamiji*. Officially, however, the traditional institutions have been formalised through the legal sanctioning of the *wenamiji* who, within the Party structure, represent the 'committee for the distribution of water', but it is significant that in practice few modifications have been made to the system of local organisation. Two discreet but parallel organisational structures have therefore evolved, as indicated below.

STRUCTURE OF TRADITIONAL POWER



STRUCTURE OF ADMINISTRATIVE POWER



Potkanski (1987: 216)

Such a parallel organisational structure, it may be surmised, is primarily a consequence of the isolation of Wasonjo villages. Interest being shown by District and Regional Agricultural personnel, warn Burra and van den Heuvel (1987a) may herald the onset of change.

In contrast to Wasonjo villages, those in Mto wa Mbu are both politically and physically very accessible, and furthermore do not share the deeply embedded spiritual, cultural or ethnic identity of the former examples. One may surmise that these factors have been contributory

to extensive party involvement in village politics and administration since independence, as manifest in the development of irrigation organisation during the past three decades.

Arens (1979) reports that responsibilities for water control were assumed by TANU by the early 1960s. As described above formal village organisation had, by 1964, become based upon the division of each village (or village sub-unit) into 10-house cells. As has been described in several Wachagga villages on Kilimanjaro, this structure formed the basis for irrigation organisation, each elected cell leader assuming responsibilities including the scheduling of water allocations for his area. Above this level in the organisational hierarchy, cell leaders elect a subdivision elder (*Mzee wa kijiji*) whose responsibilities entail water management over the larger geographical area. With the prevailing political conditions established within Mto wa Mbu even prior to independence, Arens (1979) comments, "The emergence of TANU as the arbiter of the irrigation system was inevitable during the years after independence. Its organisational framework encompasses the entire community while its officials have the legitimacy to regulate usage and forestall potential conflicts" (: 24).

It is of great significance however that recent research in Mto wa Mbu suggests that despite the impression of a firmly established formal village authority exercising its jurisdiction over irrigation and water management, the 'actual' influence village government has is far more limited. As Bertelsen (personal communication) comments, having recently returned from the area, while 'officially' the village government, through its land use committee are highly influential when electing water distributors, writing bylaws and mobilising labour for maintenance work, in practice this is seldom the case. As Bertelsen has commented, 'there is a very big gap between how villagers would like or think village government is functioning and the reality'. Indeed this very point has also been observed by the author of this paper in Babati District, where again despite the involvement of the party in many areas of village activity, irrigation organisation has retained many of its traditional characteristics including a substantial degree of autonomy in terms of water management (Southgate 1993).

During the past decade Mto wa Mbu has received substantial foreign assistance, amounting to US\$2 million (Martens 1991) in order to rehabilitate and significantly expand the former irrigation system. Farmers have, however, had little involvement in decision making, all decisions have been made by the technical or bureaucratic government bodies, occasionally in conjunction with the Village Council. Whether the Village Council is actually representative of the villagers, as has been questioned above, is somewhat doubtful. As Martens has remarked, "The lack of institutions and/or procedures for participation by farmers in project decision-making has had serious consequences for the post construction phase of the project" (1991: 92).

While irrigation development, having been primarily associated with the attempted institutionalisation of indigenous organisation structures, has been subject to relatively little external support, domestic water supply development since independence has been characterised by a substantial degree of village-institution leapfrogging, both by foreign donors and central/regional government. This issue is addressed in the final section of this paper. That until recently the absence of 'user' participation, as has typified attempts to modify irrigated agriculture, in project planning, construction, operation and maintenance, has directly contributed to the non-sustainability of many water supply developments, can be attributed to both domestic and foreign donor policy towards the sector. Each are examined below.

Water supply development policy and popular participation

Traditionally, responsibilities for the procurement of domestic water have been held by the individual family, although the aforementioned Wachagga represent an exception as both irrigation and domestic water supplies were dependent upon furrows, owned and maintained by clans. Investment in water supply development dates back to around 1930, although not until 1946, under the British colonial regime was the Water Development Division established. Tschannerl (1979) identifies the following objectives of public expenditure on rural water supply developments during the colonial administration:

- to supply minor government settlements
- to supply European farmers and other colonial outposts
- to encourage the introduction of cash crops for export or as food for the labourers and the Europeans on the plantations
- as reward and pacification of the African population (: 89).

As Tschannerl stresses, the technology and expertise provided by the colonial administration ensured that they controlled rural water supply development, thereby allowing the aforementioned objectives to dictate where projects were undertaken, and precipitated amongst the indigenous population a level of dependency on European technology, further strengthening the colonial interest in the sector. The role of village institutions, other than supplying free labour for project construction played very little part in rural water supply development.

Independence, and most importantly the creation of nucleated villages to facilitate the provision of social services and economic infrastructure conveyed water supply development to high on the political agenda. In 1971 Tanzania embarked upon a 20-year Rural Water Supply Development Programme. As Mutahaba (1989) notes, "The programme implementation was to be the incarnation of the country's policy of self-reliance" (: 110). The 'decentralisation' reforms of local government, whereby district autonomy over finances and project selection and implementation was transferred to regional level, hindered the 20-year target of supplying the entire population with adequate safe water. More salient however, as is now widely contested, was the fact that despite the apparent centrality of village self-reliance to the independent governments socialist philosophy, planning, construction and maintenance remained the responsibility of government. Furthermore, Boesen (1986) argues, government showed little concern for the organisational dimensions of rural water supply, and indeed expressed concern that villager participation would merely unnecessarily delay construction.

While villagisation presented a theoretical system by which village councils could present their own water supply project proposals to district, and in turn regional authorities, most often at the latter level such plans were 'hijacked by experts' (Mascarenhas 1983) fuelling villagers' perceptions that water development projects were the property of *Maji* (the popular name for the ministry of water). Furthermore, while villagers had traditionally utilised their own crude sources of water, shallow wells, springs and streams, the choice of what has, in retrospect, proven to be inappropriate technology (pumps and piped delivery systems) alienated the rural population from responsibilities of construction and maintenance.

When the rural population's capacity to undertake co-operative self-help activity was exploited by government in water supply development, again participation was coercive. A mandate issued in June 1973 declared that it was now compulsory for all unskilled labour to contribute to their village water supply projects, a move primarily designed to save money rather than to achieve a greater degree of sustainability. Still the regional Water Engineer's office undertook project planning and construction, utilising *Maji* skilled technicians

That recipients of water supply projects have been reluctant to participate voluntarily, as is well documented, has resulted in neglect and frequent vandalism of water delivery systems. It is widely argued, however, that the policy of providing 'free' domestic water, central to TANU socialist philosophy even before they acquired political power after independence, has been counter-productive and, indeed, represents a fundamental contradiction to the party's self-reliance ideology. Mujwahuzi (1984) also emphasises this issue, suggesting that the choice of 'need' rather than economic viability as the principle dictating project selection resulted in the 'development potential' of such projects being ignored.

Prior to independence, tariffs were levied for water supplies, the Makonde Water Development Corporation, for example, was established by the British regime in the early 1950s, charging 10 cents for every resident in the district in addition to the 10 - 15 cents at water kiosks (Mashauri and Katko 1993). Such is the nature of the climate in the area, water supply was [is] a necessity, and tariffs provided the economic sustainability of the scheme. However, abiding by pre-independence promises and pursuing the socialist path towards social development, TANU started financing all water supply investments in 1965 and five years later assumed economic responsibility for operation and maintenance costs. The water supply sector rapidly 'stagnated' as the financial burden of the policy constrained investment in new projects or even maintenance of existing schemes. As Mashauri and Katko note, through providing water free of charge, "the government lost its first excellent opportunity to mobilise and teach people about self-help and self-reliance" (1993: 32). The recent history of domestic water supply development supports the assertion made by Livinga (1992) that despite Nyerere's apparent accentuation on providing a degree of local autonomy, emphasis on 'madaraka ya mwisho' (final authority) of the party has, "had the effect of undermining local initiative and people have been led to look upon the party as the provider of all their development needs" (: 218).

Realisation of the need to involve local institutions in water supply management was articulated during the 1980s both by foreign donor agencies and *Maji*, with the question of 'ownership' featuring highly in the debate. President Nyerere himself announced in 1982, "Whatever the technique used, for building water supplies, it must be adopted in consultation with the local people, and from the beginning the responsibility for looking after the facilities must clearly be theirs. The government cannot finance the maintenance and repair work of basic village equipment if new developments are to go ahead" (speaking at the second Ordinary Party Conference, quoted in Mashauri and Katko 1993: 35)

Although a technocratic attitude, divorced from concerns over social constraints, dominated rural water supply development for two decades after independence (Tschannerl 1979), recent government policy has placed greater emphasis upon the more traditional role of local organisations, allowing villagers themselves to prioritise their own development projects, a factor which has proven fundamental for project sustainability. As history has shown,

financial self-reliance is a prerequisite for autonomy, the role of local organisations in development will clearly be strengthened by economic independence from the state. As Livinga stresses, "who pays the bill in the end acquires the power" (1992: 221).

The National Water Policy, accepted in 1991, explicitly emphasises the future role of local autonomy in water supply improvement. The policy dictates that every village should form a Village Water Committee and establish a village fund specifically for the purposes of water supply development, allowing the village to operate and maintain its own system (Mtunzi and Lombardi 1993). To complement this scheme, as has been reported in Singida Region (*ibid.*) between 25 and 30 health workers are selected from villages in order to raise villager awareness of the relationship between contaminated water and disease. That the village should provide not only financial, but also technical resources for the maintenance of projects, 'well caretakers' are assigned the responsibilities to ensure the pump (well projects being the primary source of improved water supply in accordance with the principle of adopting more appropriate technologies) remains in good order.

The policy can be regarded as an attempt to reduce dependence on the district councils' resources for water supply development. When district councils were re-established, and re-assumed responsibility for education, health, roads and water, it was intended that local authorities would become financially more self-sufficient. This has not materialised, district councils have been unable to maintain services or infrastructure, and water supply development has accordingly failed to achieve expected targets. Therefore, financial independence at the village level has granted a degree of autonomy seen by many as a prerequisite for sustained rural development and further strengthened the role of the formal village government.

The marginalisation of local organisations has, however, only partly been a consequence of centralised sectoral involvement, the interventionist role of donor agencies has further distanced villagers from projects. As Mutahaba has commented, "aid is developmental only if it lays the foundation for its future rejection, that is, if it can be used in a manner that promises eventual self-reliance" (1989: 108), yet a policy subscribing more to self-interest rather than altruism has characterised the approaches of most foreign donors (which now finance 80 percent of the sector). Donor assistance was attracted by the appeal of basic needs programmes at the outset of Tanzania's drive towards water supply provision, but as Therkildsen (1986) observes, the provision of water, and the sustained operation of implemented projects was seen as a technical rather than institutional problem. As a prelude to project investment, Regional Water Master Plans (RWMPs), covering 17 of Tanzania's 20 regions and completed in 1985, comprising water resource inventories and proposals for local level (usually village) water supply schemes (Armstrong 1988), were undertaken. All but one were funded by overseas aid agencies at a cost of approximately US\$1 - 2 million per region (Therkildsen 1988). The defined targets failed to be met, the reason being, suggests Therkildsen, that, "The consultants (and the donors who defined their terms of reference) implicitly based the plans on the assumption that financial, material and institutional constraints did not exist" (1986: 299). Several donors have subsequently become involved in specific water supply projects (in 12 regions) with funding levels in the range US\$0.5 - 1 million per region annually (Therkildsen 1988).

Donors increasingly channelled their financial resources directly into their own projects rather than into sectoral planning and implementation institutions in the government. At district, regional and national level, aid organisations operated independently. Bypassing of governmental bodies resulted in weakened local institutional ability to succeed donor agencies, and neither government staff, nor villagers - the 'passive receivers' of externally funded water supplies (Therkildsen 1986) - assumed responsibility for operation and maintenance of projects after their completion. As Mutahaba comments, to marginalise Maji, "is to make the programme of community-operated and -maintained schemes still-born" (1989: 120)

The control-oriented approach towards planning and implementation has therefore dominated donor support for water supply development in Tanzania, although Therkildsen (1988) does point out that the role played by Sweden and Denmark, in particular, in providing technical assistance is gradually erring towards that of 'teacher' as opposed to 'performer', a distinction Hanadle et al (1983) have advocated as necessary to strengthen local institutions, and hence enhance sustainability.

Many rural communities regarded water development projects as extraneously conceived and implemented, and initial calls for communal participation in maintenance subsequent to donor involvement were ill-received. In terms of rural water supply, "local participation has therefore been much more restricted than is implied by Tanzanian professed ideology" (Therkildsen 1986: 300), due primarily to the top-down planning approach by both aid agencies and central government, the former motivated by the popularity of schemes addressing 'basic needs', the latter by political ideology.

Irrigation development, learning from past mistakes

In many regions in Tanzania, traditional irrigation is proving unable to withstand rapid increases in rates of deforestation, motivated by both economic and demographic changes since independence. Increased seasonality of river discharge (due to reduced infiltration) has affected several traditionally irrigated agricultural areas through reductions in dry season stream flows upon which such systems depend. Less water and greater demand (created through rapid population increases) necessitates greater efficiency in on-farm water use. Irrigation development, accordingly, requires the adoption of a holistic approach.

As has been repeatedly stated, user participation has proven to be a requisite for sustainability, as particularly well exemplified by the poor performance of top-down approaches in rural water supply. The locus of accountability, and the perceived degree of ownership are factors most influential in determining participation. Traditional forms of social organisation typified by indigenous irrigation communities, as Coward (1980) has observed, are greatly dependent on such factors. Yet in view of the need for resource management to embrace elements beyond maintenance of furrows and intake structures in pursuit of a holistic approach, one must ask, can indigenous organisations assimilate roles within, what Keller (1990) has identified as the three principal physical management domains of an irrigation system, the 'water supply system domain', the 'agricultural domain' and the 'watershed domain' ?

As Keller suggests, sustainable irrigation development requires technical inputs, such as

- information about crop selection, husbandry protection and management,
- management in all three domains,

- capital and credit,
- irrigation system and farming equipment, technologies and supplies.

Burra and van den Heuvel (1987a) advocate that aspects of afforestation and soil conservation, together with standardised design and construction (which, as discussed above, constrained sustainability in rural water supply development) necessitate co-ordination at national, regional and district levels. Furthermore, the contribution of the numerous donor agencies, often pursuing their objectives in complete isolation from all levels of organisational hierarchy, should also be subject to central government direction. As the authors remark, at present many villages are excluded from government technical assistance (through district staff) as they are located within the 'territory' claimed by a donor agency, "although the specific programme of the donor is often restricted to assist a few villages spread over many years" (: 69). That donor organisations are generally too 'small and weak' to provide services such as the enforcement of environmental protection or agricultural extension has also been remarked upon by Therkildsen and Semboja (1992).

Burra and van den Heuvel (1987a) support the 'two-way approach' in which modern village irrigation schemes and large scale projects remain under the direction of the Irrigation Division (the former being of importance in relieving population pressures in traditionally irrigated areas) while district Agricultural officers continue to provide the technical support for traditional irrigation development. Co-operation between village authorities (having ultimate control over land distribution and hence the capacity to legislate on new furrow system and field layouts) and Agricultural staff may be essential for improved efficiency in traditional irrigation. Poor levels of service from district authorities in recent years, however, have been attributable to the fact that local governments have not been successful in collecting revenues (Therkildsen and Semboja 1992). Indeed the fact that local governments have failed to deliver such services has been responsible for the 'surge' of NGOs in recent years (Bratton 1990). Increased capacity of district authorities to provide technical services, and the mobilisation of labour through self-help co-operation represent the two fundamental prerequisites for sustained irrigation development.

The efficiency with which the indigenous 'irrigation community' provides an institutionalised vehicle through which self-help activities are undertaken has proven fundamental to the operation and maintenance of numerous traditional irrigation systems in Tanzania. Other than where economic or geographical isolation dictates otherwise, such forms of indigenous organisation have been assimilated into the formal village political and administrative system. Democracy, autonomy and self-accountability would appear to remain central to traditional irrigation management however, even where formal village committees have assumed managerial responsibilities for irrigation. Labour mobilisation through the self-help projects, whether they be traditionally or formally motivated, provide the basis for irrigation development at village level, the self-help potential in most districts, claim Therkildsen and Semboja (1992) is 'far from exhausted'.

By 'scaling-up', local indigenous organisations are sometimes able to, "construct alternative channels that bypass unreliable state institutions (Bratton 1990: 92), yet as the author adds, such forms of organisation are, "commonly crippled by desperate shortages of professional skills that inhibit their involvement" (: 92). The sustainability of future developments in the irrigation sector clearly hinges upon technically broader managerial inputs that the village

alone can provide, district authorities would be the most appropriate institutions to assume the necessary multi-function roles, their success in turn may depend upon external assistance. Donor assistance may therefore be most beneficial if directed towards the promotion of local authorities' capacity to provide the technical assistance village organisations, whether formal or traditional, will depend upon in coming years.

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**LOCAL ORGANISATIONS AND NATIONAL RESEARCH SERVICES:
RESTRUCTURING THE RELATIONSHIP**

by
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Rural Resources Management Group
Rural Poverty and Resources Research Programme

RPRRP
Working Paper No 8

January 1994

Funded by Natural Resources and Environment Department, ODA

Local organisations and national research services: restructuring the relationship

Anthony Bebbington
John Farrington

Synopsis

The context

The concept note for Part II of the unifying theme suggested that the Network specific papers should pay attention, inter alia, to the following themes:

1. the implications of reduced ldc government expenditure for agricultural research and extension
2. the theme of civil society, and the need to develop the capacity of organisations in civil society (i) to represent peoples' agricultural development needs and (ii) to take on a more active role in self-managed development

These are the themes of this paper. It is taken as given that in the short and medium term, donors and governments will expect non-governmental organisations and rural peoples' organisations to take on increasing roles in research and extension, and to work more closely with governmental research and extension.

Evidence, however, suggests that:

non-membership NGOs are not always responsive to the needs of small farmers, and that indeed just as donors are discovering NGOs so there is already a rising awareness of the gulf between their rhetoric and practice as regards participatory and client responsive agricultural development

membership NGOs (or rural peoples' organisations) are constrained in their technical abilities to do research and extension, and are also frequently less responsive to members needs than often expected

commercially motivated organisations will only respond to small farmer concerns when given specific incentives or when operating under particularly profitable contexts

In this context, this paper concentrates on three main questions which it is anticipated will become increasingly important in donor agencies programmes to make research and extension systems more poverty oriented, responsive and participative:

1. what do we know about the policy and institutional factors that can improve the two way flow of information between the rural poor and agricultural research. In what

ways does the current restructuring of government research and extension services influence these factors;

2. what active roles have organisations of small farmers and rural people played to date in research and extension: how can the effectiveness of these roles be increased;
3. what are the main potentials for professional (non-membership) NGOs working more closely with government in the context of public sector reform; what are the obstacles to these NGOs being more responsive to the concerns of the rural poor, and how can they be addressed.

Taken together, these issues relate to the theme of down-stream linkages in a demand-led natural resources research strategy. The paper is therefore also written as a complement to work focusing on up-stream linkages commissioned by ODA earlier this year (Pearce, Bebbington and Farrington, 1993).¹

The paper points to possible answers that have been suggested in the literature and in experience. These answers merit closer scrutiny in subsequent years of the unifying theme.

The paper

The general movement behind current restructuring of public research and extension is for government to move away from controlling implementation of agricultural programmes. Instead government's role should increasingly be to provide a more supportive environment for other agencies involved in poverty oriented agricultural development. This will not be possible in all cases where these agencies are absent, but where it is possible, government services should become a research and training resource oriented towards strengthening these agencies in technical and institutional terms. At the same time, it should concentrate on improving the availability and flow of information on a range of technical options among farmers, agencies and government. In this way government will be providing a range of options (or a "basket of choices") to farmers, and strengthening the capacity of intermediary agencies to do the same. How can this be done?

Technology developed by research and extension is more likely to be relevant to small farmer needs when there are close triangular links between farmers, researchers and extensionists. Similarly, technology development will be more effective and relevant when there is increased communication among the members of each of these categories - i.e. among researchers,² extensionists and farmers. These links will be all the more effective when they foster open discussion between the people involved.

¹ This paper is available from the Agricultural Research and Extension Network paper on request.

² Perhaps particularly among researchers involved in different stages of strategic, applied and adaptive research.

These links can be built in a number of ways. Possible links that increase interaction and discussion include on-farm trials, liaison units between research and extension, joint research planning exercises etc. The management of these links has been reviewed recently by ISNAR.

It is increasingly recognised, however, that building and maintaining such linkages is costly. In particular, attention has been drawn to the costs of on-farm and participatory technology development, and the difficulty of scaling it up beyond contacts with a handful of farmers. Furthermore, public sector resources to manage such linkages within the public sector are extremely scarce and in many countries shrinking. Consequently, having learnt these lessons about linkage, the current challenge is how to build and manage links not simply between different actors, but also between different types of organisation. Among donors and national research services this challenge has led to interest in the role that rural peoples' organisations (RPOs) and professional non-government organisations can play in "stretching the development dollar" and in making research and extension more effective, efficient, demand oriented and equitable in its impact.

This paper reviews some of the changes occurring in national agricultural research and extension services, and has considered what we know so far regarding the capacity of membership and non-membership non-government organisations to fill some of the gaps left by a receding public service, and to make a reorganised system more effective.

Evidence suggests that if government researchers and extension professionals coordinate with NGOs and RPOs, this will increase the efficiency and effectiveness of public sector resources. Among other things, working with such intermediaries allows:

- researchers to have indirect contact with many more farmers
- more on-farm trials
- a degree of cost sharing - for instance, NGOs and RPOs can take on costs of supervising trials
- RPOs to participate in research, thus scaling up the coverage of farmer participatory research
- researchers and extensionists to coordinate with professionals with complementary skills (eg in rural organisation)
- more farmer feedback into the setting of research agendas
- some degree of increased access to the poorest of the rural poor (to an extent)

However, evidence in the literature and from AgREN's personal contacts with members suggests that the capacity of NGO and rural peoples organisations falls somewhat short of much that has been claimed for these types of organisations. This is not surprising, and should not be used as a reason for a quick loss of faith in them. Many paradigm shifts in development thought are pushed through by recognition of problems in existing practices (such as government research and extension) and by the promise of an easy and quick solution from other quarters. The paradigm shift is now occurring. It is therefore time to recognise the constraints on the capacities of these new "saviours," and to orient policy and the limited resources available for agricultural development to reduce these constraints.

A first group of constraints relates to the uneven social and geographical coverage of RPOs and NGOs. Such organisations do not exist everywhere. Hence a research/ extension policy that aimed to work only with these organisations as counterparts would be biased against certain areas. It may also be biased against certain social groups as there is evidence to suggest the RPOs in particular may not represent all - or the poorest and most powerless - sections of village society. This implies that in some cases it will be appropriate to form new RPOs to target particular clients. This, however, is not an easy or cost free process, and demands skills that government often lacks. Specialised NGOs could assist in this, contracted in to work with crop researchers concerned to work in areas where RPOs do not exist.

In the interim as groups are forming, and in those areas where, because of an unfavourable socio-economic and political environment, group formation will be complicated, it will be necessary to continue with more orthodox approaches to extension. However, the cost constraints of continuing - for instance - with a T&V approach imply new strategies. Among these the most effective may well be to conduct limited client-oriented research and then disseminate technical ideas and options through communication systems that local populations already use. These range from periodic markets, to transport routes, radios, churches etc. This is another sense in which research and extension can focus less on implementing and more on creating an enabling environment for farmer innovation - in this case, an enabling informational environment that builds on communication patterns that already exist.

A second group of constraints relate to the limitations on NGOs' and RPOs' technical capacity. Their ability to access technical expertise, information and resources is also often weak. In particular, their access to public sector resources is limited. In part this is because a history of distance and some distrust between government and non-government sectors. In present times it is also because government has often approached NGOs somewhat heavily-handedly, and has tried to make use of them rather than work with them as partners.

Government research and extension can also create an enabling environment to assist NGOs and RPOs to address some of these constraints. The essence of this strategy must revolve around government research making itself and its research expertise a resource for NGOs and RPOs. Given the often weak links between government and other NGOs and RPOs, this implies placing emphasis on building linkages and contacts and confidence. Some of the links that emerge should enable NGOs and RPOs to relay needs and research priorities to government. Among the most effective mechanisms for this seems to be a combination of (1) periodic formal research planning meetings with different actors represented, and (2) the maintenance of informal contacts. These latter can be improved by occasional secondment of staff.

At the same time government can refocus part of its extension orientation on providing training to these organisations to strengthen their own professional expertise. Such a role would be fulfilled in two ways: providing training directly where government has the facility, and where it does not, searching out expertise from other national NGOs, private sector agencies, etc. Government thus becomes both a provider of expertise where it possesses it, and a searcher of expertise where it does not. In preparation for such work government would need - ideally in conjunction with an NGO umbrella organisation - to survey the needs of national NGOs and RPOs in order to know the nature of "market" demand for government support.

A more radical option is for NGOs and RPOs to begin commissioning research and training support from government services. This however requires that the organisations have the capacity to prioritise broadly felt research needs, and that they have the funds to commission work. Few organisations have such funds themselves (those that do tend to be involved in relatively lucrative off-farm activities such as processing and marketing). There have been some experiments in the creation of such funds for commercialised agriculture, but to date there is little experience for the small farm sector, though some such funds are currently being proposed (eg in Guatemala). However, it is an option that merits attention.

A third group of constraints are those relating to the institutional limitations on RPOs and NGOs. In many cases they are not as participatory and representative of the rural poor as is often claimed. In addition, they are mostly dependent on external financial resources. This weakens them as institutions, makes them dependent on donor criteria of project success, and can stand in the way of them developing long term strategies.

It is not simple for donor support to research and extension to address these problems, and some certainly go beyond the responsibilities of a natural resources programme. However, there are some things that can be done.

To the extent that more emphasis needs to be placed on increasing client orientation in NGOs, this implies support to increase capacity to conduct PRAs and link them to ethnographic and survey techniques in order to identify needs. Again these are skills that government may well not possess internally. However, government resources can be used to commission training in these areas, and so deepen such capacity within the country. This does not imply creating this capacity in all NGOs but rather strengthening a handful of NGOs with such expertise who will then assist other NGOs and government in such needs identification, in establishing participatory monitoring systems etc.

To the extent that RPOs and NGOs are not representative of the broad spectrum of rural peoples' concerns, research and extension programmes should avoid relying too heavily on any one organisation as a counterpart or as a source of ideas in the planning of R&E. Where possible, farm surveys must continue to be a complementary input to joint planning and participatory planning exercises, precisely in order to pick up on any discrepancies between what the leadership of an organisation claims to be a local need, and needs identified by the local population. Similarly, it is important to encourage continuing relationships between NGOs and RPOs in programmes of R&E in order that each keeps the other accountable.

Local organisations and national research services: restructuring the relationship

Anthony Bebbington
John Farrington

The restructuring of national research and extension systems that is proceeding in much of Africa, Asia and Latin America will imply new relationships between government services and local organisations. Specifically, it will imply an increased role for local organisations in managing natural resources, in providing support services to farmers and in seeking out sources of external support.

These new roles make many assumptions about local organisations. These assumptions include: that these local organisations exist; that they have management capacity; that they are based on norms of behaviour that will guarantee a degree of equity in how these services and rights are to be distributed; and that they are sustainable.

These assumptions have been made for perhaps two main reasons. Firstly they have been based on a body of so-called populist writing that has argued that indigenous knowledge, local groups and non-governmental organisations are more relevant to farmers than are scientists' knowledge and centralised government organisations. Secondly, the assumptions have also been made in order to put a positive veneer on reorganisations of government research and extension made necessary by public sector reform, cutbacks in government expenditure and the influence of the donor community - an influence that is particularly significant in the poorest countries of Africa.

Given that this is the origin of these assumptions they merit some critical appraisal on the basis of the limited (but growing) evidence we have on local organisations. At the same time, however, we must take the reduction of government intervention in the provision of agricultural services as a fact: it is the main contextual factor within which we must think about new roles and relationships and about how to make research and extension services more responsive to small farmer concerns.

This paper therefore:

- (i) reviews the main evidence we have on the preconditions for enhanced farmer responsiveness in research and extension and gives examples of how research and extension services are being reorganised to meet these conditions;
- (ii) analyses the role that local farmer and community organisations (referred to generically as rural peoples' organisations - RPOs) can play in research and extension, and considers their strengths, weaknesses and needs;
- (iii) analyses the most appropriate roles for professional service providing non-governmental organisations (referred to as NGOs) in these new relationships.

The basic argument of the paper is that we ought to be cautious about the potentials of local organisations, but that ultimately programmes that enhance the roles of local organisation in agricultural development vis-a-vis the state should be endorsed. This, however, is on the condition that the restructuring of institutional roles must be a slow and careful process, which must be accompanied by long-term efforts to strengthen local organisations. The evidence also suggests that strong organisations emerge slowly and on the basis of particular types of support. If well managed then such programmes will contribute to ODA-NRED's more specific goal of increasing responsiveness of research and extension service. They will also contribute to ODA's more nebulous, but equally explicit and important goal to foster more transparent and democratic relationships between government and society in developing countries. Thus, whilst our discussions are focused on research-extension linkages, it must be emphasised that the types of inter-institutional relationship proposed to improve linkages, will also help make rural civil society stronger.

I CLIENT-RESPONSIVENESS IN PUBLIC SECTOR RESEARCH AND EXTENSION

The capacity of public sector research institutions to respond to feedback from the intended users of the results of research depends primarily on the nature and strength of links established between researchers and intended users, but more generally also on links among the various components of the technology generation and transfer system.

Drawing on work by Kaimowitz, a generalised overview of the types of institutions - both public and private - comprising the technology generation and transfer system, and the types of linkage between them, is presented in Figure 1.

Researchers can expect to receive two types of information from organisations and individuals situated further downstream in the technology generation and transfer system:

first, information on changes in the context likely to influence the uptake and impact of research results, which, in turn, might need to be taken into account in the prioritisation of future research. For instance, successful programmes by NGOs to organise paraveterinary services and the introduction of genetically improved poultry (eg of the type reported by Mustafa et al (1993) for Bangladesh) will increase the potential returns obtainable by livestock keepers from the use of balanced feeds, and so enhance the demand for research, and prospects of uptake of the results of research in this area.

second, information on the specific performance of individual technologies, either individually or as components of wider farming systems, will be valuable in decisions on whether eg to transfer the lessons from successful research to other settings, to conduct further research to refine the technologies, or to abandon work on them altogether and switch resources into other, higher potential, possibilities.

The contextual information provided by organisations and individuals in the technology generation and transfer chain is only part of the wider set of contextual information which is potentially useful to researchers: changes in export or import market conditions, for instance,

may influence the profitability of specific technologies and so increase or decrease the demand for research in those areas, as may also changes in the type or quality of available rural infrastructure, changes in local market conditions, and so on. Whilst such contextual information is important, it raises questions of information flow and organisational structure broader than our present interests, and so for the purposes of the present paper our focus is on specific feedback.

Two major sources of proposals on how GOs might be reorganised to enhance their capacity to respond to clients' needs are drawn upon here: first, the results of recent research by ISNAR into the structure and management of links (Merrill-Sands and Kaimowitz, 1991), and, second, the results of a major review of literature on social science issues in agricultural research (Biggs and Farrington, 1991), a principal focus of which was the extent to which the needs and opportunities faced by farmers were adequately being taken into account by public sector research.

To summarise, the ISNAR studies review the policy and institutional factors which influence the strategies and mechanisms which research managers can use to develop links, the relevant organisational factors (size, structure, the existing division of responsibilities among organisational units; the scope for merging units having complementary responsibilities into a single department; the scope for retaining separate units but having them coordinated by a single manager, a coordinating unit or a committee of representatives), the types of linkage mechanism that managers might use, and questions of status and motivation among research and extension staff.

Work by Farrington and Bebbington (1993) on the links between NGOs and government research and extension services examine how a number of operational links function in that context. Adapting ISNAR's work on linkages between government research and extension services, they consider a number of joint professional activities (problem diagnosis; planning; programming; implementation; evaluation; dissemination and training) and provide examples of each. They also consider how joint resource allocation procedures might be established. Insofar as there is substance to NGOs' claims that they operate in ways more participatory than NARS, and so are likely to be able to interpret the views of the rural poor and feed them back into the decision-making processes of NARS, then linkages of this kind clearly offer potentially positive opportunities for enhancing feedback.

Three of the four priority issues for future research identified by the Biggs/Farrington review relate closely to the development of links between researchers and the intended users of research output: the development and wider implementation of farmer participatory research methods, the analysis of current patterns of feedback and of how it might be stimulated, and the analysis of motivation and reward systems and their influence on relations between national agricultural research service (NARS) staff and, on the one hand, international research centres, and, on the other, the intended users of research results.

These issues clearly have a bearing on the choice of approaches to the organisation and management of research and of research methods which would facilitate feedback. Rather than discuss them in the abstract, we present in Box 1 a case study of recent efforts to enhance client-orientation and feedback in Bangladesh, and then draw out the principal lessons and areas requiring further research.

Box 1: Recent efforts in Bangladesh to strengthen the organisation and management of research services to facilitate improved responses to feedback

The Bangladesh Agriculture Research Council (BARC) appointed a Working Group on Farming Systems Research and Development (FSRD) in 1992 which deliberated in 1992-93 on ways of enhancing the client-orientation of research undertaken by FSRD programmes as part of the preparation of the World Bank funded Third Agricultural Research Project. The review was conducted against a background of weak farmer participation and feedback to research (Jabbar and Abedin, 1989). The changes in structure and functions which it proposed were intended to improve both the efficiency of generation and dissemination of relevant technologies and feedback on their performance.

The review took place in a climate of increasingly severe resource constraints: a number of strategic options for FSRD had therefore to be considered - work could not simply be expected to expand on all fronts. The strategic options fell into six areas: functional balance (ie among research, technology transfer, links with component research etc); geographical scale; scope (commodities, subjects, issues); methodological depth; the division of institutional responsibilities and levels and sources of resources.

The review proposed detailed changes in each of these areas in order to enhance two-way interaction with clients:

Functional balance: work in purely research functions (description, diagnosis, design and testing) historically had consumed 60% of FSRD resources but demonstrated few results; it was therefore proposed that it should in future be limited to 40%, and that in partial compensation, links with component research should now be allocated 20% of resources (previously 10%). This was expected to have the added benefit of orienting component research more closely towards clients' needs. Technology transfer and feedback, and the provision of specific services for clients, would now absorb a total of 40% of resources against 30% previously: a number of successful initiatives had been undertaken in which clients (especially NGOs) had requested a combination of research, advisory work and training, and these composite initiatives, rather than research alone, were seen as increasingly important in getting work done which was relevant to clients' needs.

Scale: following a detailed review of the performance and prospects of the 20 FSRD sites operated by teams from 7 institutes, it was decided to cut down research activities in some sites, replacing them by specific efforts to test (and obtain feedback on) technologies at farm level in collaboration with local organisations, but also to expand the number of sites in hitherto neglected agro-ecological zones.

Scope: the review concluded that there had hitherto been an overemphasis on crops, and that the needs of low income farmers and the landless could better be met by reducing the crops component from 60% to 45% of overall allocations, with corresponding increases in the livestock, fisheries and forestry components. In terms of research issues, the review argued that efforts to build up systems-relevant "packages" from individual component trials were generally fruitless: such packages could not take into account the wide range of agro-ecological and socio-economic circumstances facing farmers, and so tended immediately to be "unpicked" by farmers; far better therefore to provide farmers with the components to build their own packages. Consequently, the review recommended a reduction in the resources allocated to component trials from 40% to 15%, with substantial increases in the allocations to a number of activities designed to bring researchers into closer contact with the intended users of technology and those representing them. Such activities included the provision of advice and research support in marketing (where constraints to FSRD had previously been noted, but no systematic way of addressing them had been developed) and agribusiness (input supply, processing and marketing firms had all expressed an interest in advice from FSRD on aspects of their work; and scope also exists for promoting small-scale input supply, as witnessed by the successful initiatives to promote the homestead production and sale of improved sugarcane planting material).

The overall tenor of these recommendations has been to reduce the allocation of resources to the component technology testing in crops, and increase the allocation to moving technologies to intended users, obtaining feedback from them, responding to this feedback in their own programmes and creating demands on the commodity programmes. Such changes will require new skills (social sciences; technology transfer) and some reduction in existing skills (crop sciences). They will also require stronger inter-institutional links between FSRD and commodity programmes, on the one hand, and FSRD and the range of organisations working with or representing small farmers and the rural poor on the other (eg input, processing and marketing companies; NGOs; farmers' associations).

Lessons and further research needs

Our review of major studies on research-extension-farmer linkage, on-farm client-oriented research and social science issues in agricultural research, together with a case study of recent efforts towards stronger client-orientation and feedback in the Bangladesh NARS suggest that:

1. "Feedback" issues cannot be considered as a phenomenon restricted to parts of the technology generation and transfer process, such as the interaction between extension agents and farmers, or between systems-oriented and commodity-based research. In reality, feedback will be constrained unless structures and operations in the entire process have been geared to facilitate it.
2. Resource allocation decisions have to be taken in a number of areas, including functional balance among the various components of the NARS, the geographical scale of systems-oriented research, its thematic scope and methodology, the divisional of responsibilities within the NARS and its type, source and levels of resourcing.
3. Such decisions generally have to be taken under resource pressure, so that trade-offs have to be weighed carefully and some areas reduced as others are expanded.
4. Feedback involves not only farmers but also the wide array of organisations (private commercial; private non-profit) involved in providing services to enhance farm productivity.
5. Knowledge is particularly limited on the ways in which research can interact with private commercial operations, whether large/medium scale or homestead-based, and whether to support and/or regulate their activities.

Much of the current literature (as well as the Bangladesh case study) gives only circumspect treatment to the sensitive issue of staff motivation and reward systems. Some observers circumvent the issue by assuming that low performance can invariably be remedied by more training. Papers produced during a recent ISNAR study of small NARS (in 50 countries) have demonstrated the limited validity of this assertion: the better qualified staff are frequently the first to market their skills en route to alternative employment; staff linked into international research networks find themselves with severely reduced time for in-country priorities; several small NARS have suffered a haemorrhage of staff to the point that their institutional survival is threatened (Gilbert & Matlon 1992). The reality is that training is only one of several factors influencing motivation. Reward systems are generally more important, and where these are determined purely by internal assessment, motivation suffers two types of shortcoming:

- a) most frequently, motivation is low and client-orientation negligible
- b) in some cases, performance assessment criteria depend on eg the number of articles published in peer-reviewed journals. Here the tendency is to prioritise and conduct research which lends itself to the production and publication of results on a predictable schedule, such as fertiliser x variety trials. Such work may have only coincidental relevance to the real needs of the rural poor.

Efforts to introduce elements of external pressure towards client orientation have taken two broad forms:

- a) clients have been directly represented at a number of levels of decision-taking in both formal and informal capacities. Whilst there is much informal participatory decision-taking in research processes, there are up to now very few documented examples of ways in which farmers are formally represented on committees that have a mandate to decide (or even advise) on resource allocations for public sector research. One exception is at the Centro de Investigaciones en Agricultura Tropical in Bolivia (CIAT) in Bolivia (Bebbington et al 1993).
- b) in a very few cases, farmers' organisations (or organisations claiming to represent their interests, such as NGOs) have commissioned research. The herd management systems developed by CIAT in Bolivia under commission from the cattle owners' association (FEGASACRUZ) is one example; there are others among coffee growers' associations in Colombia. In Chile, the adaptive research and extension service for small farmers has been reorganised on the basis of government commissions to NGOs to provide a set of services agreed both by government and by farmers themselves (Aguirre and Namdar-Irani, 1992). In Sierra Leone, NGOs are being provided with the funds to commission research from the local public sector agricultural experiment station as part of a rehabilitation and resettlement programme in the wake of open-cast rutile mining (Bebbington...). In Bangladesh, local authorities are using decentralised powers and funds to commission research from the public sector in response to local needs (Gilbert, pers. comm.). The directness of farmers' "demand pull" implicit in these arrangements gives them a strong appeal to donors (A Bennett, pers. comm.). It is clear that much more needs to be known from the experience gained so far about the preconditions for their success. In particular, donors, governments and NGOs need to know under what conditions farmers' associations become strong enough to carry out functions of this kind, and this is the subject of major proposed research between ODI and ISNAR (Bebbington, Farrington, Merrill-Sands, 1993).

In summary, further research is needed on:

- a) the arrangements for farmer representation on the decision-making bodies of research organisations, and the conditions which must be met if these arrangements are to succeed;
- b) the conditions for successful "commissioning" of public sector research by farmers, their organisations and those that claim to represent them;
- c) the conditions for successful emergence of farmers' organisations strong enough to carry out functions of this kind;
- d) the ways in which private commercial agencies (eg in input supply, processing and marketing) can be supported and/or regulated more effectively by NARS, and can be linked more effectively with farmers and their organisations.

II FARMER AND COMMUNITY ORGANISATIONS IN RESEARCH AND EXTENSION

We now have considerable accumulated experience of agricultural research and development activity based on the claims that farmer participation is critical to the generation of technologies that are relevant to farmers, and that participation should occur at as early a stage as possible in the process of technology generation. Farmers are increasingly involved in the screening of planting material, technologies and even ideas about technologies at a stage well before the researcher has much understanding of the nature and performance of that technology.³ This early involvement is related to the other belief that farmers should be involved in making decisions about the course of a research programme (Heinrich, 1993).

Yet as these experiences have moved forward, more recently we have heard a growing concern that the limits and costs of farmer participatory research have not been given due attention. Indeed these concerns often come from the very persons who have hailed the importance of farmer participation. Thus Okali, Sumberg and Farrington (1993) draw attention to the costliness of participatory research, and of the time and money implied by involving farmers in research. Similarly Ashby (1991) refers to the need to 'scale-up' the degree of farmer participation in agricultural research and extension. She also draws attention to researcher fears that to involve farmers in research before technologies are adopted runs the risk of subjecting farmers to faulty technology, and thus of damaging farmer-researcher relations. As she notes, the worries about cost are not independent of worries about quality:

"[t]here are also worries about the additional cost of managing a decision-making type of farmer participation if this involves researchers in more intensive interaction with farmers. How to scale-up farmer participation to achieve broad coverage of a large number of farmers without incurring excessive expenses and compromising the quality of participation is a key issue that has to be resolved" (Ashby, 1991:281).

Even federations representing farmers have pointed to some of the drawbacks of conventional farmer participatory research and on-farm research. A seminar of the International Federation of Agricultural Producers (IFAP), for instance, commented that when individual farmers are the researchers' point of contact, there is nothing to ensure that other farmers will learn from the experience: participation in those instances is often limited to the handful of farmers who have plots on their fields (IFAP, 1990).

One suggestion for resolving these concerns regarding the high cost and restricted impact of farmer participatory research, and the need to widen its impact, has been to involve farmer organisations in the research process. This would also imply changes for extension, which would be oriented toward forming these organisations and strengthening their capacities. Also rather than delivering inputs and information to contact farmers extension would begin to work with contact groups of rural people. The organisations would be points of contact for research and extension - or in other terminology, would be the "intermediate users" of technology. The additional attraction is that in some cases, the same farmer organisation

³ Examples of this include the variety screening work at Pakhribas Agricultural Centre (Khadka, pers. com, 1993), and bean breeding at CIAT (Ashby, 1991).

would be supporting the livelihood strategies of the rural poor in other ways as well as research and extension.

Before embracing these options - pushed on by the need to reduce costs in research and extension - we need to look more carefully at the capacity of these organisations, and indeed at who participates in their activities. We may be expecting them to be more representative of the needs of the rural poor, and more able - and willing - to respond to those needs than they may in fact be. We also need to take a closer look at the nature of the organisations, for while the literature often treats them with the broad brush of "farmers' organisation" as if they were all the same, there are in fact great differences among the different types of organisation.

A further problem that arises when agricultural research and extension begins to interact with groups is that the distinction between research and development blurs even more. Group formation and strengthening has a long history going back to community development programmes, and brings with it particular challenges and possibilities. The possibilities - such as strengthening rural civil society, increasing the scope for rural people to conceive and manage their own self-development initiatives etc - are what makes a focus on groups consistent with ODA priorities such as strengthening civil society and increasing the sphere of private activity. But it may not be appropriate to expect agricultural researchers to get drawn into such activities, because their time is most effectively spent doing research. The problem, however, is that farmers may not perceive this in the same way, and may often expect more from researchers (eg Dugue, 1993). If this additional support is not given, it may complicate the quality of the relationship between researcher and farmer. This implies that in working with groups, agricultural researchers will also benefit from the presence of a third party - often an NGO - that will be concerned to respond to these additional demands. Similarly, in those cases where researchers do begin to create groups of farmers,⁴ the question arises as to how, and by whom, the group should be supported so that it survives beyond the research programme.

The nature and number of local peoples' organisations

Types of local peoples organisation: customary and created

While some of the writing on local peoples' organisations tends to assume that they are all the same, it is important to stress that there are many types of organisation.

The most important distinction to make is that between customary institutions and non-traditional organisations. Then within each of these categories there are a range of types of organisation, many of which might have a role to play in research and extension.

By customary institutions, we refer to those relationships that have long been the basis of organising socially. These would include kin networks, tenure rules, local concepts of "the

⁴ This does happen - eg Heinrich, 1993 on the ATIP programme in Botswana and Gilbert, 1990 on the FITT programme in Gambia.

community," the rules governing gender relationships, local criteria determining who has authority and how decisions get made etc. These are the rules and institutions that are most deeply bound into the organisation of rural life, and which make most sense to, and have most hold over, rural people (Moorehead and Lane, 1993).

By non-traditional organisations we refer to that range of groups that have been created in some measure by external forces and interventions, generally within recent history. Here at a base level we have associations, cooperatives, credit groups, womens' groups, landless labourers groups etc. At a regional level, we have federations of communities or cooperatives, savings and loans societies etc.⁵ In general, these are organisations that have been created with a specific purpose in mind: sometimes when that purpose (such as gaining access to project support) comes to an end, so does the organisation (Roling, 1988; Bebbington et al, 1993). In other cases, however, an organisation may have existed long enough, or may have become independent and effective enough, that it becomes a local institution that has become an important part of everyday life to people. In these cases the organisation is likely to outlive the initial stimulus for its creation.

Some of the local organisations that it is assumed will take on increasing roles in resource management and research and extension are customary institutions: groups such as communities, groups defined by their common access to common property etc. At one level, then, it is more probable that efforts to build on these groups will be more likely to succeed because they will make more sense to local people and will be consistent with local forms of conduct.

Mosse (1993), for instance, argues on the basis of Kribhco evidence, that village appraisal and planning initiatives that did not build on existing authority structures were likely to be obstructed by village leaders. A similar lesson comes from the experience of an NGO research and extension project working in the Bolivian Andes, which tried to create local organisations. These organisations were intended to be the village level counterpart for the programme. The committees and presidents of the organisations were elected on a one-person one-vote system. Although this seemed the most democratic option to the NGOs these elections distributed authority and power in ways that differed from local tradition - traditionally, authority and leadership went only to older members of the community on the basis of age, inheritance and rotation of leadership roles. This traditional practice thus prevented young adults from gaining leadership positions. Consequently, the organisations created by the NGO project attracted the interest of these young adults, who saw them as a means of gaining authority that traditional rules did not allow. The project thus created parallel authority structures in communities that essentially pitted the young adults against the old. In this case, the attempt to create and then work through local organisations created

⁵ An illustration of the diversity of these organisations is shown in an overview of farmers' organisations in Kenya (Wuyts, 1993). Wuyts has identified five main types of farmers organisation (let alone other types of rural peoples' organisations):

1. local groups
2. community groups
3. local societies (grassroots cooperatives)
4. district unions (unions of cooperatives)
5. national unions (cooperatives with a national mandate - many have a commodity focus)

conflict in communities rather than a more farmer responsive and effective research/extension programme (Rivera-Cucicanqui, 1990).

Examples such as these show us that to create new organisations can create difficulties in villages, and can in fact cause divisions rather than empowerment. On the other hand, the examples also show that customary institutions are not necessarily equitable. There is considerable evidence to endorse this observation (see below). There is also evidence to suggest that - in the specific instance of research and extension - dealing with customary institutions will not reveal local knowledge (Fairhead, 1990; Sperling, 1993, network communication).

Where does this leave us? Customary institutions and organisations all exist for particular reasons, and have the effect of addressing particular objectives. These objectives may be different from those of research and extension interventions. For instance, customary institutions might serve to continue the concentration of power and resources in the hands of a particular group in the community - a research and extension project, however might be concerned to increase the tangible assets and power of other groups.

Thus, although it might be preferable to work with existing organisations and institutions, this may not always be consistent with research and extension objectives. In cases such as these, where particular groups are to be targeted by agricultural programmes, there is a strong case for eliciting the creation of a special group. However, it must be recognised that any attempt to by-pass existing authorities and powers in a locality may lead to resistance to the programme of research and extension. It may also serve to weaken existing structures, potentially disempower local people, and undermine existing organisations.

Another general message is that whatever the case, it cannot be assumed that the meetings of customary institutions, or of existing organisations, will represent the concerns of all groups in the local population. Thus, when agricultural research and extension works with these existing structures, it will be valuable to conduct a quick survey of the members of the group and the wider population in order to assess which sections of local society are, and are not, represented.

Problems in creating local organisations: costs and sustainability

In many cases, the only local organisations that exist in a region may not be appropriate for the objectives of a research and extension programme based in the general programme priorities of ODA (especially those prioritising poverty alleviation and women). That is to say - appropriate local organisations may not exist, or may be very weak. In that case, programmes have to decide whether they should create new local organisations.

Where rural development programmes have attempted to create or strengthen local organisations, the experience has not always been positive. In addition to the social costs that can occur (such as those mentioned above) there are additional problems, in that to create new organisations can be costly and may not lead to the creation of organisations that are sustainable. Indeed many (perhaps most) come to an end after the project (Roling, 1988).

This makes no positive contribution to strengthening rural civil society - and probably is a negative contribution.

Cost questions

There is little systematic work done on the costs of creating local organisations. One effort to document this is Romanoff (1990). Romanoff's argument is based on work with CIAT and local organisations of producers and processors of cassava in Colombia and Ecuador. These two projects aimed to support the emergence of local associations of producers and processors, which then federated into a regional association.

In this CIAT programme, on average it cost between 110 and 121 days work to create a group of 10 to 30 members: i.e. it absorbed large amounts of time and human resources. Romanoff suggests that there is little scope for improving the cost/benefit ratio of creating local organisations by increasing the size of group above about 25-30 because groups larger than that tend to have lower participation rates and higher rates drop out. Smaller groups worked better because they are based on kinship and neighbourhood networks - conversely groups with members from more than one village or town tend to have higher numbers of inactive members.

However, costs could be brought down by increasing the interaction among groups, training peasant promoters to be employed by the federation, and passing over promotion and information transfer work to them. In Ecuador, the federation (UAPPY)⁶ - in liaison with official extensionists and researchers - trained and supervised these farmer promoters and arranged workshops for interaction among groups that were in the process of formation.

The Ecuador and Colombia experiences were significantly different in the success and cost of this group formation process. The Colombian project used much more senior professional and researcher time, and was consequently very expensive. In Ecuador, much more work was done to train peasant promoters to create groups. This approach turned out to be less costly and more effective. Indeed, in Ecuador while the first groups cost around \$10,000 to create, after having incorporated these farmer to farmer training mechanisms, costs fell to around \$3,000 per group. Furthermore, although by 1989 total project costs had totalled \$618,000, the Ecuadorian federation was selling \$300,000 worth of processed cassava a year. Thus, though the evidence is limited, this experience suggests that if certain methods are used, group formation need not be costly and can deliver significant benefits in certain contexts.

Questions of organisational sustainability

This discussion touches on another regarding the sustainability of local groups, which in turn has implications for the costs and benefits of creating organisations. One of the most important arguments to justify the cost of creating organisations would be that the

⁶ The Union of Associations of Producers and Processors of Yuca.

organisation created would continue to deliver benefits to its members well beyond the life of the initial research/extension activity.

However, this is often not the case - many groups that have been created have died after the end of a project. There are a number of reasons for this which suggest that it may not always be feasible to create self-sustaining organisations. This in turn suggests that a policy to concentrate research/extension activities on local organisations might well prejudice those environments in which it will be difficult for organisations to survive.

There are a number of reasons why organisations do not survive. Some have to do with the motivation of people for joining them, others to do with the local social and economic context. We deal with each in turn.

Organisations emerge and people join them, often in response to particular local problems and particular opportunities (Garforth, 1993). The presence of a research and extension initiative might be one such opportunity. However, though the initiative may not be responding to a problem which local people consider particularly acute, people may nevertheless join organisations created for the research/extension activity as an opportunity to gain access to researcher time, not because it meets a priority need in a village. Indeed some have noted that the reasons for rural peoples' participation in a group R and E endeavour are often quite different from the researchers' reasons (Long, 1992; Nuijten, 1992). People may participate for reasons that are to do with the presence of a project per se regardless of whether it is a research/extension project. Thus, the purpose may be to gain access to resources, or to enjoy the prestige of working with a project. In cases such as these, once the project ends, and development agencies withdraw, then any organisation created to work with the project is also likely to die away.

Aside from the need for the catalysing effect of a problem or opportunity, organisations are more likely to emerge and be sustainable in enabling environments, where there is local commitment to the idea of collective action, and where historical factors are conducive.

For instance, a comparative study of federations or rural peoples' organisations in Ecuador concluded that the factors most likely to lead to a sustainable and strong organisation were that (Bebbington et al., 1992):

1. the organisation was engaged in activities that had a significant impact on their members' family income, and generated income for the organisations own administrative costs. This economic impact was what motivated members to a continuing commitment to collective action;
2. the environment gave sufficient political freedom to allow the emergence of organisations, and gave sufficient economic opportunities to allow the organisation to identify a viable economic role for itself. This was a favourable enabling environment;
2. the organisation and its members had already received - and continued to enjoy - a relatively long term programme of support in which popular education, literacy and organisational training were key elements. This support strengthened the organisation's ability to take advantage of an enabling environment. Similarly, strong organisations

were more likely to emerge where there had been less conflict among and within local villages. These two factors provided a conducive historical context for the emergence of local organisations.

Other studies come to similar conclusions. In West Africa, for instance, Gubbels (1993) stresses that often the political environment has obstructed the emergence of organisations, either because it has been repressive or government has tried to coopt these groups. In Romanoff's (1990) example, a critical factor in the success of creating organisations in Ecuador was that their advisors identified a lucrative, local and accessible market for processed cassava - an enabling economic environment. In Mali, a cotton development company found that long term literacy and administrative training were an important prerequisite to strong village associations (Sy and Bah, 1989), and an interesting experience of an assertive organisation in Senegal also suggests that organisations are strengthened and more likely to be sustainable when they have an impact on family income (Mercoiret et al., 1990).

These conducive contexts do not exist in all cases, and consequently it may often be difficult to create viable and sustainable organisations. In these less conducive contexts, some critical factors are beyond the control of an R and E project. Although others can be addressed, this requires investment of time and resources - for instance the provision of literacy, administrative and numeracy training. These imply the need for resources and skills that an R&E service may not possess.

Of course, in a research and extension programme, it may not be the intention to create a local organisation that will continue to exist. The objective may be simply to work with a group during a number of trials. In these cases, the issue of sustainability and the time and investments implied may not be thought relevant. This will be all the more so in cases of agricultural research. Crop researchers may argue that their job is not development, but research, and their efforts (and hence the purpose for creating farmer groups) should be limited to research (c.f. Dugue, 1993).

The line is a fine one, however. Regardless of the researchers' concern, rural people's groups will not see the distinction between research and development. They will make additional claims on a research project's time to help in group formation, and to address additional issues of local concern. As Romanoff's Colombian example shows, this can be a great drain on researcher time, and very costly.

The implication is that once the decision is made to work with groups - and above all where groups need to be created or strengthened - the researcher is moving into a development activity for which the researcher has neither the skills nor resources. This in turn implies that wherever possible the best way to work with groups is where a development programme - NGO or government - is already working to strengthen local groups. The presence of other activities can lead to problems for the researcher because research will not necessarily be main priority for the NGO or development programme, and hence may not always give full support (Mercoiret, 1990). However, it is probably the only way that researchers can work with groups in a way that avoids too many additional claims on their time, and that reduces the likelihood that the group will cease to exist once the research programme ends.

The case for involving farmer and local peoples' organisations in research and extension

The case for involving local organisations can be built on a number of arguments. One type of argument refers to the function that these organisations can play. A complementary approach is to concentrate on the influence they would have on the impacts of research and extension.

In functional terms, rural peoples' or farmer organisations can perhaps play three different types of role (Bebbington, 1991):

1. Firstly, they can provide an interface between the research and extension worlds of development agencies and the production and living conditions of the resource poor farmer population (Box, 1987).

This is perhaps the most frequently noted role for RPOs. They can ease the relationship between the research and extension concerns of external agencies and the indigenous knowledge and innovations of farmers. In cases where an organization already exists, it offers external agencies a point of entry into a region. The organization can direct the agency to expert farmers, use its meetings for discussion of the agencies' agricultural work, provide locally relevant knowledge, and facilitate extension activities through its own networks, news sheets, radio programmes and meetings. Also, when the RPO affirms the external agency, local resource poor farmers have more confidence and trust in its research and extension activities - this enhances the effectiveness of its work.

2. Secondly, they can act as what Roling (1988) calls a user constituency for the rural poor. That is to say they can exert pressure on public sector and non-governmental agricultural agencies to orient their work to the needs of the rural poor (Roling, 1988). This is what other authors call demand pull.

It is sometimes suggested that research can fail to deliver appropriate technologies not only because of poor feedback of farmers' ideas and concerns but also because there is no mechanism through which researchers are held accountable to farmers. If farmers were organised it is conceivable that they can exercise more forceful pressure on researchers, and/or that they could nominate delegates to sit on research planning boards. In either way the organisation exercises more "demand-pull" on a research agenda than individual farmers ever could.

3. Thirdly, they can perform active roles in the generation and extension of agricultural technologies in programmes that they control and administer themselves (Bebbington, 1989). There is evidence of farmers organisations that already have their own adaptive research programmes, and their own programmes of technical assistance. Often these programmes are implemented by farmer paratechnicians through programmes of farmer-to-farmer extension (Romanoff, 1990; Fujisaka, 1989a). A number of these organisations also have seed and input distribution mechanisms through which the results of research could be distributed and - in the case of lumpy technologies - shared.

By performing these different functions it is assumed that there will be several different types of *positive impact* on the generation and distribution of agricultural technologies.

Garforth (1993) has recently noted five types of improvement in the impact one might expect from involving local peoples' organisations in extension and they can be similarly applied to research/extension.⁷ These impacts are:

1. enhanced efficiency: i.e. contact with groups will increase the number of farmers a professional can contact, thus improving the cost effectiveness of research and extension;
2. enhanced effectiveness; i.e. work in groups will increase the rate of farmer learning and the number of ideas exchanged, and the extent to which they are discussed critically;
3. enhanced equity; i.e. by working with poor peoples' groups there will be a more equitable impact than in orthodox research and extension - poverty is thus more likely to be alleviated among the poorest sections of the rural population;
4. enhanced demand orientation in research; i.e. a group is more likely to be able to exercise influence over researchers, and the path taken in a research programme;
5. enhanced empowerment of rural people; i.e. the formation and strengthening of groups will give rural people a vehicle through which they can voice and pursue wider concerns.

In the following section, we consider evidence that throws light on how well these organisations perform against these different functions and potential impacts. First though, it is important to think more carefully about what we mean by a local rural peoples' organisation.

Local organisations' ability to perform functions in the research and extension system

Rural peoples' organisations as interfaces with research

Perhaps the main experience so far of research interaction with local organisations has been that in which the local organisation provides a "way in" for researchers, giving them feedback on local conditions, and allowing researchers contact with more farmers.

One experience where farmers' organisations have been deliberately created to serve as an interface between researchers and farmers is the Agricultural Technology Improvement Programme (ATIP) in Botswana (Heinrich, 1993). In this programme ATIP researchers have formed farmer groups. The members of the group then each chose which technologies they wish to test from a basket of options presented by researchers. Not all members of the group do the same trial. At the beginning of a season they are offered different options by researchers and take the one that suits them best. They then meet monthly. At these meetings they are able to discuss each others' experience and discuss the different experiences with the technologies with researchers. In this way the farmer managed trials generate data that feeds back into station research.

⁷ Garforth's research in Thailand suggests that not all these theoretical impacts actually occur - see below.

Existing organisations can also serve to fulfil this interface function. They can help the researcher identify "representative" farmers, and different agroecological zones in a region, and can help monitor trials through their own promoters (e.g. see Sy and Bah, 1989 for an experience in Mali and Bebbington, 1993 for one in Ecuador). They can also provide a forum for early mapping and PRA exercises and prioritisation of research problems.

Rural peoples' organisations as users' constituencies

There is a continuity between the local organisation acting as an interface, and it beginning to exert some sort of pressure on researchers to keep them more accountable. The organisation can use the contacts with researchers to exert pressure in a number of ways.

The most obvious is through informal pressure. In highland Ecuador, where public agencies collaborated with communities and federations, communities would use community meetings to exert some informal pressure on the use of external resources. This was more likely to occur where the community was accustomed to expressing its demands (Bebbington, 1989).

In Senegal, a similar situation seems to have occurred between a strong farmer organisation, CADEF (the Committee Acting for the Development of Fogny - a federation of 40 village level farmers groups) and a programme of technology and economic development implemented by an NGO and a government training institute (Mercoiret et al, 1990). The programme combined experimentation, diagnosis and then extension. CADEF was the main decision maker in this programme, and had to approve all strategies and decisions before they would be implemented. The involvement of CADEF seems to have instilled a greater accountability among the NGOs and other agencies. Mercoiret et al suggest that CADEF required the NGOs to:

- continually justify to the organisation any research and to show the links between research and concrete actions;
- promptly process any research data and return it quickly to the community;
- pay much attention to consulting and informing farmers at all stages of the research/extension process;
- pay much attention to the ability of staff to in fact do the work they were responsible for.

In short, the local organisation makes an external agencies' job more demanding. Of course, if the local organisation is to be successful in exerting such pressure on a research and extension agency, the agency must not have the freedom to leave the zone and go to work somewhere easier. More importantly, it requires that the organisation has various types of strength: an ability to negotiate, self confidence and financial resources to allow autonomy and perhaps even the possibility of contracting in alternative support. Once again this brings us back to the need for support that researchers cannot provide. As Mosse (1993:25) argues for the case of Kribhco, rural peoples need many skills if they are to exercise such pressure and to move from identifying a problem to formulating a programme of action. To develop these additional skills requires other techniques of animation, awareness raising, non-formal education or community problem solving. Once again this implies that they require the

support of local development agencies - such as NGOs - in addition to the support of crop researchers.

The CADEF experience points to another way in which local organisations can exercise influence - by direct involvement at an institutional level in research and extension planning and monitoring. While there has been little of this in the past, there is evidence that the current decentralisation of research and extension has sometimes led to the creation of local/regional committees for monitoring and planning research and extension and on which rural peoples' organisations have a formal representation. In Chile and Colombia such committees have been created as part of the reform of the NARS.

However, from the little that is known, it seems that this sort of participation can lead to little influence in practice. Farmer representatives are often intimidated, and say little in an unfamiliar setting with which professionals are wholly familiar. Also, researchers tend only to invite the more cooperative farmers to such committees (Wuyts, 1993).

Another way in which a group can exercise influence on station research is simply through increasing the number of farmers involved in trial replication. In the case of ATIP (Heinrich, 1993), the fact that each group member runs a trial means that the data set generated on technology performance is larger than if the researchers worked only with individual farmers. Hence the feedback from the group may have more power because it comes from a larger sample of farm trials and thus is more likely to convince station researchers than is the small amount of data generated by the odd trial here and there.

A further - and far more influential - means of exercising influence is through the purchase of research and extension services. Few rural peoples organisations have this financial capacity (without grants).

One example of this occurring is that of UAPPY - the same federation of yuca producers in Ecuador discussed by Romanoff. By 1992 UAPPY had - in addition to its processing and marketing work - become the point of contact between yuca producers in the province of Manabi and the local NARS research station. In some cases this contact has been of the interface type, but in other cases, UAPPY has used funds generated by income from its processing, marketing and membership work to fund the NARS to do specific pieces of research on cassava and related processing technology (Poats, 1993 - network communication). Through purchasing research on themes it identifies as key producer concerns, UAPPY is able to exercise particular influence on the NARS. However, this is not yet an entirely autonomous process and UAPPY still enjoys some grant-aid advisory support in the identification of producer problems.

Increasingly, as research systems have to generate more of their own income, possibilities for purchasing research support increase. Of course there are many constraints on other rural peoples organisations from exercising this degree of influence on research. One is that, with limited human resources, stations will concentrate sale of services to those who pay most, and

this is likely to be the medium/large farm sector.⁸ Thus, the creeping privatisation of NARS must be accompanied by retention of a mandate to respond to the poorest farmers.

The other main constraint on such an exercise of demand pull is that most farmers' groups lack funds to purchase research (and extension) services. Membership dues will be insufficient as farmers are too poor. Thus organisations need additional income sources. Aside from grants, the most likely source is income from processing and marketing of products - but the scope for this will be more in some cases than others. Some organisations lack the economic skills, and have members who produce products of a low value even when processed (e.g. Bebbington et al, 1993). Another possibility is to introduce "research funds" or "community funds" which organisations can draw on to purchase research and technical assistance. This is under consideration in current and proposed restructuring of research and extension services in Peru and Guatemala, for instance (IFAD, 1991; Katz, 1993 - network communication). However, in order that groups are able to use these funds effectively, they will need support in problem prioritisation, in making applications and in managing grants. Few would be able to take advantage of such funds without the support of a development agency. Indeed, it is important to stress that before UAPPY reached its current level of development it has benefitted from a decade or so of funding and advisory support.

Rural peoples' organisations self-managed research and extension

Beyond being an interface, some rural peoples' organisations have their own modest adaptive research, demonstration and extension programmes. One example of this sort of self managed research and extension programme comes from the experiences of federations of rural communities in highland Ecuador (See Box 2).

These programmes offer a researcher another "way in" in which the researchers main role is to support and strengthen existing work in the organisation (Ashby, 1991). The organisations extension programme then works with the results of that research.

⁸ It would seem that the largest farmers, companies and plantations tend to purchase support directly from the private sector or northern researchers.

Box 2: Self-managed research and extension among federations of rural communities in Ecuador

In the central parts of the Andean province of Chimborazo there is a strong tradition of organization among indigenous farming communities. This originates from demands for land, religious rights, reduced transport costs and rural infrastructure rather than demands for agricultural research and extension services. In order to sustain themselves beyond these initial activities, and to build upon the levels of organization already achieved, these federations subsequently initiated their own research and extension programmes. This was also a response to the weakness of government services in these areas.

This farmer initiative was not entirely independent. National and international NGOs played an important role in making financial and in some cases personnel resources available for these activities. In some cases, national NGOs have also been important in assisting and stimulating the process of inter-community federation. One strategy is to enhance the strength of RPOs through the process of organized discussion, design, and administration of the project.

A further sense in which the research and extension methods used by these organizations are not independent is that they are modelled on government and NGO development projects, often using demonstration plots, field days, extension visits, seed multiplication and input distribution systems. The difference is that farmers control, implement, and indeed own a large part of the projects.

The different RPOs do not have identical perspectives on their agricultural research and extension activities but there are recurrent themes. In the long term, they feel that to sustain and enhance rural livelihoods requires strong organization (the user constituency function) and their work aims to serve this purpose. They see the need to increase local income possibilities, in order to reduce the need for periodic labour migration. Increasing time spent in the region will help strengthen family, community and federation, as well as avoid other personal and economic costs of migration.

With such goals in mind, they assist members in the promotion of both food and cash crops. This is done through carrying out some very simple trials on selected crops with the aim of achieving modest increases in yields without increasing costs or production risks. These trials are conducted with the help of a formally trained agronomist hired on full or part-time basis. This information is supplemented by the agronomist's own knowledge, his continuous conversation with members of the organization and by observing the effect of different technological practices in plots planted in members' fields. These plots serve two purposes: they meet the farmers' particular food and income generation goals, and they generate research information.

Through this process, simple technological packages are progressively adapted on the basis of local experiences. Information on these adaptations are made available to members through a variety of extension methods. The RPOs conduct their own training courses, meetings and radio programmes. A key strategy is to train indigenous extension agents. These then return to work in their own community, sometimes financing their activities through commission on inputs supplied or through wages paid by the federation. These farmer extension agents are trained through courses given by the RPOs' own agronomist and by guest lecturers contracted by the organization. In these courses the pros and cons of modern agricultural technologies are discussed, along with principles of ecological agriculture, traditional practices, natural resource management and issues of nutrition, health and safety. Sometimes the farmer extension agents are sent to courses given at the national agricultural research institute. In this way they are trained in ideas from formal agricultural science, and assess it in the light of their own local knowledge. Some become more "modern" than others, but all have understanding of both informal and formal agricultural science.

This, then, is a partial institutionalization of farmer-farmer extension. It has the many advantages that these "extension agents" speak the local language, live locally, understand local social etiquette, and have local environmental knowledge. The drawbacks are that they tend to be younger and may lack authority, and that they sometimes lack time for these activities because they too have to generate their own incomes and tend to their own farms.

These RPOs also run their own subsidized input distribution programmes, particularly for seeds. Some RPOs have also tried to initiate small loans programmes and marketing projects. There has been less success in these programmes because of the particular market knowledge required and the greater

risks to organizational integrity once larger quantities of money are handled. All these efforts are elements in a strategy aimed towards increasing income by reducing local production costs.

These programmes are linked under the same federations, which illustrates that the RPOs themselves believe that to increase the sustainability of agriculture and of rural livelihoods in these areas will require a number of changes: not only in agricultural technology, but in the terms of trade, in credit provision, and in the creation of complementary local sources of off-farm employment. The provision of different services under one FT also eases farmer access to a variety of programmes in which government has not helped the poor. However, it also places greater strain on the RPOs' institutional capabilities.

Whilst these activities are managed at the level of second order organizations, there are also community level initiatives. Some communities have gained access to NGO support, and have developed elements of their own seed and input distribution systems within the community. At times, community "expert" farmers perform an advisory role within these schemes, although not all experts are keen to make their knowledge available. Whilst such community-level initiatives also build on local knowledge, their biggest disadvantage is that they stimulate competitiveness between communities in the dash for NGO funds, weakening inter-community collaboration. Although there is also some competitiveness between second order organizations, this could be more easily and efficiently resolved through negotiations over sharing resources and expertise.

Source: Bebbington, 1989

However, it must be stressed that these programmes have many technical weaknesses, and the quality of research is often weak (though not always - see Trujillo, 1993). These programmes are also often dependent on external funding. Only in a few cases (e.g. Healy, 1988) is there evidence of moving towards self-financing programmes. Significantly these are in cases where members produce high value products.

The impacts of rural peoples' organisations in research and extension

What do we know about the real impacts of rural peoples' organisations performing these research and extension functions? So far very little. The following sections uses Garforth's (1993) five categories of type of impact to organise some of this knowledge.

Efficiency and Effectiveness.

Intuitively it would seem that to work with a rural peoples' organisation will increase the cost-effectiveness of researcher time. At the very least there will be contact with more farmers. However, more importantly is the evidence that working with a group can allow researchers to establish more trials and/or generate more data. Dugue reports a case from Senegal where a NARS researcher was able to establish fifty trials with one farmers organisation (Dugue, 1993). Perhaps the most systematically collected evidence on this scaling up of researcher impact has come from the monitoring of work with farmer groups in the ATIP programme in Botswana (Heinrich, 1993; Heinrich and Modiagotla, 1993; Norman et al, 1988). This work also went on to influence thinking in the Farmer Innovation and Technology Testing Programme in the Gambia (Diallo and Senghore, 1990).

In the early years of ATIP, trials were researcher managed and implemented, or researcher managed and farmer implemented. Both approaches absorbed a lot of researcher time. Also

this approach allowed only a few farmers to participate. The decision was therefore taken to experiment with group approaches (Norman et al, 1988).

After seven years of experience, Heinrich is able to list the following benefits of working with groups (Heinrich, 1993). The specific benefits included:

1. higher adoption rates (after several years of group functioning);
2. wider discussion of, and access to, knowledge;
3. researchers became more aware of farmer ideas and circumstances;
4. a larger number of replications entered into comparative analysis of trials

More general benefits have been:

1. increased capacity of a resource constrained research programme working with groups: increases the number of trials above the total possible if researchers were managing all trials themselves;
2. increased efficiency - by increasing the amount of research done per unit of researcher time, and by increasing the relevance of research;
3. improved links between an on-farm research programme and station research. This was unexpected, and happened mainly because the groups allowed more trial replications and thus also more chance to test a wider variety of technologies;
4. improved links to extension - through extension agents' participation and through providing a core of farmer researchers who can then participate in farmer-to-farmer extension.

In essence, Heinrich is saying that the group approach is more efficient in a cost/benefit sense, allowing few resources to go further. He also suggests it is more effective, as farmers learn more through the interactive reasoning and argument that occurs in group settings.

It is important to stress however, that it is not always certain that efficiency and effectiveness are increased through group work. As Romanoff (1990) notes, it can be costly to create groups, and unless cost reducing measures are found then the cost will not necessarily be justifiable. Furthermore, it is important to avoid the temptation to increase apparent cost-effectiveness by increasing the size of the group, as larger groups are prone to far higher rates of non-participation and do not lend themselves to interactive learning. Even in small groups, a few farmers often dominate discussion (Ashby, 1991; Norman et al, 1988): in larger groups this is even more likely to happen.

With these caveats in mind, however, evidence from as diverse a set of locations as Thailand (Garforth, 1993), Mali (Sy and Bah, 1989), Ecuador (Romanoff, 1990), Chile (Aguirre and Namdar-Irani, 1992) and the Gambia (Gilbert, 1990) suggests that if managed carefully, and if groups are not too large, then research/extension linkages with groups can increase the efficiency and effectiveness of research and extension expenditure.

Demand orientation

In the discussion of how rural peoples' organisations can perform a "user constituency" function we have already seen how they can exercise a demand pull on research.

However, there are relatively few documented cases of this happening. Research just beginning at ISNAR suggests that in both Kenya and Burkina Faso, while there are a diversity of farmers organisations, few have any policy for trying to link up with and exercise influence on research institutions - either because they are not aware of the possibility, or see little use in it (Eponou, 1993; Wuyts, 1993).

This early conclusion of the ISNAR study, however, is probably too negative. On the one hand, demand pull can be - and often is - exercised in informal ways: not to have a "linkage" policy does not therefore mean no influence is exercised. On the other hand, while some would agree that farmers do not have much interest in research, and that they participate in trials for reasons other than research (Long, 1992) this is not always so. A study of farmer collaborators in ATIP in Botswana (reported in Heinrich, 1993) concluded that the large majority collaborated because of an interest in technology and not because of the chance to get free inputs (which are minimal anyway). Similarly a mid-term evaluation of the Sustainable Agriculture and Village Extension (SAVE) programme in Sierra Leone showed that farmers did not participate because they wanted access to resources (indeed they received only very small amounts of planting material) but because they were interested in widening their basket of varieties and were generally interested in new technologies (Gordon et al, 1992).

Nonetheless, it probably is the case that it is mainly the larger organisations, or the regional and commercially strong organisations such as UAPPY, that are most likely to be interested in influencing research, and most able to exercise this influence in anything but an informal way.

What also seems clear is that an organisation is more likely to make initial contact with research institutions - and thus take the necessary first step to influence their research agenda - when the organisation has an external advisor, such as an NGO, or an agronomist. This is largely a social phenomenon. Rural people have few or no informal contacts with researchers, and are drawn from quite different social groups. NGOs, on the other hand, are typically staffed by people who are from the same social class as researchers, and who have done enough formal education to have come to believe in the value of research. They have been socialised into seeing research as important, farmers have not; they have informal contacts with researchers and research institutions, farmers do not. Exercising demand on research is thus not only a question of institutional "linkage" - it is also one of bridging a social and cultural gap. Advisors and NGOs can help RPOs to achieve this bridge.

Equity

On several occasions we have noted that working with customary institutions and local organisations may not always enhance the equity of the impact of a research and extension project. This is so for several reasons. Organisations may effectively exclude certain sectors of the local population. Also, attending the meetings of local organisations when they interact with researchers and extensionists takes time out of peoples' other economic activities. The poorest families, and those who need to migrate out of the village periodically may not be able to absorb this cost of participating in such meetings.

Even if the group does not exclude certain sectors, it is almost always the case that there is differentiation among the membership of village level groups - some families have more resources than others, families possess different qualities of land, some have water some do not, and so on. Consequently different families have different production systems, and different research and extension priorities.

In circumstances such as these, some R and E services and development agencies create sub-groups within the village. These sub-groups have been based on gender, on socio-economic status, on production system etc. In Chile, for instance, the NGO AGRARIA has decided that, despite the rhetoric of community development and the NGO tradition of strengthening community level organisation, it is more effective to create sub-community groups. These what they call "interest groups" ("*grupos de interes*") and they are based on production system, landlessness or at times on gender (Aguirre and Namdar-Irani, 1992). Thus, for instance, in one village there were interest groups for: families with vine based systems, families with wheat-legume based systems, families with pasture based systems, and for landless youth. Each group received different types of training and technical support. The creation of subgroups allowed a targeting of poorer groups (eg landless youth), and also allowed AGRARIA to provide training and technical support that was more closely specified to the concerns of the members of the interest group.

In Thailand, Garforth (1993) similarly concluded that extension approaches based on rural peoples' organisations did not increase the equity of extension impact. Indeed, he recommends that, where this is the goal, services should try to create organisations specifically composed of the poorest sectors of village society.

On the other hand, it may be that the presence of some organisation is better than none, even if it does not represent the poorest. Sims and Leonard (1989) argue this case. They suggest that even large farmer organisations can bring some benefits to the poorer families. If the presence of the organisation means that on-farm trials, ideas, inputs and seed come to a locality, then some of the information generated and some of the seed introduced is likely to find its way into small farm production systems through word of mouth, local labour relations, or even theft of seed.

The general lesson so far appears to be that we cannot and should not expect an organisation to represent all interests in a village. We therefore need to assess who it does and does not represent. If certain groups are excluded then the next stage is to create sub-groups to target particular beneficiaries. However, in order to prevent resistance to the activities, services will probably also have to find ways of benefitting local authorities in order to gain their support. Similarly, in order to avoid weakening higher (i.e. village) level organisations efforts must be made to find links between the sub-groups and the higher level of organisation.

Empowerment

Empowerment can occur at a number of levels: from individuals and groups learning a new confidence and new skills, through to the establishment of self-sustaining groups who can address other development issues - either through other self-managed initiatives, or through making demands on other institutions. The evidence on how often such empowerment occurs is patchy, but it is clear that it is far from automatic, and often does not occur.

In the ATIP case, Heinrich (1993) noted how a group approach can lead to a subtle and gradual process of the former type of empowerment. Over several years of group work, farmers began to argue as a group against researchers' ideas, and for their own ideas. Arguing as a group rather than as individuals gave them more leverage and influence. "This subtle change in the dynamics of the relationship ensures that research becomes more responsive to farmers' needs." (p 19).

This type of confidence is, however, a long way from more systematic political empowerment of the group as a whole through which "rural people can find voice and economic power with which to confront the structures and processes that sustain their disadvantaged position" (Garforth, 1993:6). Indeed, Garforth's survey of rural peoples' organisations in northern Thailand suggests such empowerment rarely occurs, particularly when these groups are dependent on NGOs or government.

Yet in other cases an effort to work with and strengthen groups clearly can increase their capacity to exercise influence over economy, society and politics in such a way as to address constraints on their development (Bebbington et al., 1993). However, these are cases where the support to the group has been sustained over a long period and has not been primarily research and extension support but has included income generation, popular education and administrative training.

The implication is that to work with groups in research and extension will not necessarily empower them, nor necessarily strengthen rural civil society. It can do so - but only when the research and extension support is linked to the broader social development activities of other agencies.

Conclusions

The evidence in the literature suggests that whilst there is considerable potential for involving rural peoples' organisations in research and extension, both as partners and as implementers, there are also many constraints on how far they can fulfil this role. In some cases they do not exist, and the local political and socio-economic environment is not conducive for their emergence as sustainable organisations. In other cases, they exist but have a number of weaknesses, which include the following:

1. they lack managerial skills and financial resources;
2. they lack contacts with research services and other formal institutions;
3. they are not always representative;
4. they do not always distribute benefits equitably;
5. there are multiple obstacles to their sustainability; and
6. because they sometimes have multiple concerns - such as land rights, credit, marketing etc - they may not always place research and extension as a high priority.⁹

⁹ Conversely the existence of these other activities also means that research and extension work is more likely to be consistent with wider food system concerns.

These observations imply that there remains important roles for non-membership service agencies. Some of these roles are relatively akin to orthodox agricultural service provision. In some cases, where organisations do not exist, those agencies must continue providing direct support to farmers. In other cases, where rural peoples organisations do exist, non-membership services will still be required to make the link with research services and other formal institutions.

At the same time non-membership agencies have more novel roles to play. These include: encouraging the emergence of peoples' organisations where these do not exist, but where the environment is conducive to group formation; providing training and support to help strengthen existing organisations; acting as a third party to ensure accountability within rural peoples' organisations, and so on.

Many of these tasks require skills, and require time commitments that agricultural researchers do not have and often cannot afford to give. Consequently support for group formation must come from elsewhere. One option is that public extension services provide this support. However, these services often lack such skills (Garforth, 1993). In other cases, government extensionists earn so little that they cannot afford to dedicate the time to such work (PAC-Nepal, pers. com.). Cutbacks in extension personnel make this task even more difficult, just as they complicate continued support to contact farmers in more traditional T&V approaches.

All this implies that other agencies have roles to play. In some cases, they will need to provide relatively orthodox services where government is no longer able to do so. In other cases, agencies specialised in working with groups have an important role to play in supporting the emergence of new groups, in strengthening existing groups, and in imparting these skills to other agencies and government staff.

III THE NON-GOVERNMENTAL SECTOR: APPROPRIATE ROLES AND INSTITUTIONAL CAPACITY

In the preceding sections we have commented that:

- (i) the decline and cutbacks in public research services imply that other agencies have a role to play in working with government in research and extension;
- (ii) RPOs can pick up some of these roles; but that
- (iii) RPOs suffer many weaknesses that it is inappropriate (or impossible) for government agricultural researchers (and often extensionists) to address, and that this requires the additional support of local NGOs; and
- (iv) RPOs do not exist everywhere and so in many cases the counterpart of government research and extension will have to be non-membership NGOs.

NGOs thus have two main roles to play: (a) as an immediate counterpart to government for designing and implementing research and extension programmes oriented to the rural poor; and (b) as a partner to strengthen RPOs so that they ultimately become implementers of R&E and direct collaborators with government.

This section first discusses strengths and weaknesses in the NGO sector and some of the implications of these for appropriate direct relationships between government and NGOs. It then discusses the NGO-RPO relationship, limitations on NGO capacity to support RPOs, and how these might be addressed.

Strengths in the NGO sector: Implications for Relationships with Government¹⁰

NGO strengths

While NGOs frequently fail to live up to pro-NGO rhetoric. Nonetheless, the areas in which they have made substantial contributions include: participatory agricultural development, methodological innovation, institutional organisation, and implementation. Nonetheless, there is much diversity among NGOs in their respective strengths and their general overall effectiveness: some are better innovators; some are better popular mobilisers; some are better implementers.

Many NGOs operate with a concept of participatory agricultural development that goes beyond concepts generally expressed in farming systems and participatory research literature. Theirs is not only the participation of a joint experiment, or on-farm trials (Haverkort et al, 1991). Instead, participation has a political resonance, implying an effort to strengthen peasant organisations, and to enhance the rural poor's capacities for self-management and negotiation.

NGOs have therefore emphasised project methodologies and actions that contribute to strengthening co-ordination among individual producers, and subsequently among communities. Seed and input distribution systems, irrigation development and management, and work with farmer groups to design, conduct and evaluate on-farm trials have thus become priority areas of action. Many have also introduced a social organisational and management dimension into the testing and subsequent adoption of certain technologies (Henderson and Singh, 1990; Mustafa et al, 1991). In many cases such a combination of productive and organisational initiatives can increase the impact of the project and strengthen the organisation simultaneously. The ultimate aim is to establish financially and administratively self-sustaining rural organisations (CESA, 1991).

In general, NGOs' technological 'innovations' have been primarily adaptations of existing techniques. Their more important innovations are mainly methodological. Thus, while conventional public sector approaches to research have had difficulty in coping with the wide range of agro-ecological and socio-economic conditions characteristic of the areas in which many of the rural poor live (Biggs, 1989 ; Chambers et al, 1989 ; Richards, 1985), considerable experience has now been gained among NGOs in methods of farming and food systems research, and in participatory rural appraisal (Aguirre and Namdar, 1992; Sotomayor, 1991; Fernandez, 1991). Similarly, although dissemination of NGO technologies is ultimately limited by their small size and limited spatial coverage, some NGOs have

¹⁰ The section draws on Bebbington and Farrington, 1993

developed institutional and methodological innovations to facilitate the spread of technologies, such as farmer-to-farmer dissemination (Sollows et al, 1991).

Another form of innovativeness, found primarily among the more academic NGOs, has been the development of alternative proposals for agricultural development. In certain countries where the university sector is in a critical condition, the bulk of this sort of research work has been done within NGOs (Lehmann, 1990).

This capacity for innovation is partly a reflection of their institutional characteristics. Their smallness, and the related institutional flexibility, similarly contribute to their work mystique, and to the NGOs' 'shallow' hierarchies, and short lines of communication. Smallness and flexibility also facilitate effective collaboration among disciplines, a capacity for rapid decision taking, a quick response to eventualities and a work ethic (and corresponding reward systems) geared to generating sustainable processes and impacts.

These institutional characteristics may also lead to a certain effectiveness in implementing agricultural development, but this is rather more questionable. Their proclaimed efficiency in implementation may be largely an effect of the small scale at which they operate, which has the negative effect of constraining how far they can operationalise their innovatory approaches.

Furthermore, there is some evidence to suggest that NGOs' organisational and innovatory work becomes circumscribed the more they become involved in action and implementation (Ribe et al, 1990: 19). The experience of the Chilean NGO AGRARIA with the National Institute for Agricultural Development's (INDAP) extension programme is illustrative here. Since 1990, INDAP has allowed NGOs to tender for contracts to implement agricultural extension. AGRARIA committed itself wholesale to winning contracts, and doubled its staff. However, the number and inflexibility of contractual requirements prevents those parts of AGRARIA working with INDAP from pursuing the social promotional work that characterised the NGO's work in the past. While AGRARIA's strategy has been to use the income from these contracts to subsidise experimental work in post-harvest stages of the food system, the burdens of implementation are damaging the cohesion and identity of the organisation and prevent the reflection necessary to incorporate any lessons into AGRARIA's own strategies. Tensions have also emerged between those working under the rigours of INDAP contracts, and those on donor funded projects that allow more time to be spent experimenting and fostering farmer organisation (Aguirre and Namdar, 1992).

Implications for NGO relationships with government

The fact that many NGOs' institutional advantages seem to lie in the promotion of local organisations, in innovating and proposing alternatives rather than in implementation is significant for government organisation-NGO collaboration. As we noted above, NGOs' capacity to innovate and promote participation has been recognised among funding agencies and governments (World Bank 1991a:136). Yet the bulk of funding they offer to NGOs is for project implementation which tends to crowd out both participatory and more experimental and innovative work, and so reduces the prospects that NGOs will generate lessons from which the public sector might learn.

Although donors and government organisations (GOs) say that 'the importance of NGOs lies in their ability to involve communities and grassroots organisations more effectively in the development process and in addressing poverty' (World Bank, 1991a:136), most of their initiatives to involve NGOs have, as we noted, been in project implementation and service delivery. Yet if implementation tends to crowd out work in innovation and organisation, then these actions reduce the likelihood of achieving the stated goals.

This mismatch between what donors and GOs say and what they do has various implications. One, less generous, conclusion is that governments and their donors do not really want NGOs to continue organising and empowering the poor, and are seeking to frustrate such work by: (i) increasing the NGOs' service delivery work, and reducing the time available to them for organisational strengthening; and (ii) drawing the NGO into a closer relationship with donors and government, through which the NGOs have to become more accountable to them, with the consequence that their relationship to the poor becomes compromised and weakened. This risk worries many NGOs.

A second, more generous, conclusion is that, put bluntly, donor agencies and GOs want it all ways - grassroots organisation, innovation and implementation. We believe that this may not always, or often, be possible, at least, not from the same NGO. This implies that the choices in any inter-organisational collaboration must be made more explicit. We return to this in the conclusion. But first we review certain NGO weaknesses - for they too suggest inconsistencies in how NGOs approach government.

Weaknesses in the NGO sector: implications for the role of government

NGO Weaknesses

With the current enthusiasm for NGOs, it is easy to overlook fundamental limitations in their approach to agricultural development. For all the resources they command, most NGOs remain very small, resulting in resource constrained research and dissemination capacities. As these small organisations proliferate, the lack of coordination and inter-NGO communication is increasingly serious. Similarly, their agricultural projects remain very local and rarely address wider structural factors that underlie rural poverty - except through some faith in the transformative potential of the political action of an organised peasantry.

These limitations imply that the quality of NGO work would be enhanced by (i) access to technical services, and (ii) by engagement in forms of inter-organisational relationships.

Access to technical services: Some NGOs have generated resource management technologies: indeed the agroecology movement owes much to work done in South-based NGOs (Altieri, 1990). Nonetheless, their resource constraints and dependence on short cycle project funding hamper the long-term research commitments required by the development perspectives they espouse (such as sustainable resource management). A recent study of NGOs' work in agricultural technology in Bolivia shows how serious the resulting problems can be (Kohl, 1991). NGOs developing greenhouse technologies for horticultural crops in the highlands, faced by competition for funds and short funding cycles, responded by demonstrating

technologies before they had been adequately tested. Many of these technologies subsequently proved to be faulty, causing economic losses to some small farmers.

The sorts of research resources that would ease this constraint on NGOs' technical work are generally located in government services and universities. One of the functional complementarities most frequently espoused is that government services be assigned the work of research, and NGOs the task of transferring technologies developed and adapted in these research activities (ISNAR, 1989; Sotomayor, 1991; Wellard et al, 1990). Indeed, there are many cases where NGOs have successfully adapted GO generated technologies to the conditions in which the NGO was working (Aguirre and Namdar, 1992; Sotomayor, 1991).

Interest in exploiting such a complementarity is expressed by some NGOs. South American NGOs noted their need for access to programmes of peasant-centred agricultural technology development to generate the technologies for which they lack the capacity (Bebbington et al, 1992). It was recognised that in many cases these programmes will be located in the governmental sector. A group of Asian NGOs similarly expressed their need for access to the skills, facilities, genetic material, and specialist knowledge of government services (Farrington and Lewis (eds), 1993). It was noted that this access is generally hindered by the complexity of government bureaucratic structure and procedure.

Simple statements about complementarity between GOs and NGOs must, however, be treated with caution. On the one hand, there is no guarantee that the types of technical support NGOs require will exist in the public sector. Technology development work being done by GOs may lack relevance for NGOs' target groups, and some public research institutes may be so weak as to have ceased functioning effectively. In these circumstances, NGOs are left with two options. One is to seek support from other national or international sources, such as universities. Thus, agroecological NGOs in Latin America have sought support from US, and more recently local, universities. The second option is to seek to increase GO resource commitment to technology development for resource poor farmers. This option, which necessarily implies a closer (though not necessarily cordial) relationship with GOs, is discussed below.

Engagement in inter-organisational relationships: The limitations of the NGO development model may lead them to enter into relationships with GOs in order to influence technology development, to enhance coordination of activities, to improve communication of NGO innovations, and to influence the policies and programmes that set the context of NGO actions.

Influencing GO technology development: It is a significant and complicated transition for NGOs to move from merely adapting GO technology to changing the sorts of research that GOs do in the first place, for this implies a direct relationship with government. CIPCA, a large NGO in Santa Cruz, Bolivia, participates in setting the agenda for the public sector research institute and collaborates in trials. CIPCA claims that this influence on GO research has increased the technological quality of its own work (Garcia et al, 1991). Similarly, the largest Ecuadorian NGO, CESA, in collaborative work with an agricultural research institute, has fostered lower input fruit crop research that has generated technologies appropriate to the agroecological and socio-economic context of CESA's small farmer clients (CESA, 1991).

Enhancing coordination and the communication of innovations: Much information generated by NGOs remains poorly disseminated, either to the public sector or to other NGOs, just as GOs are not good at communicating with NGOs (Zadek et al, 1992). Thus, NGO innovations and experience are rarely communicated into the wider agricultural development community.

Some NGOs have therefore suggested that they require links to government to widen their impact on national agricultural programmes. Others comment that a structure is necessary to help co-ordinate actions between NGOs and GOs in order to avoid proliferation and duplication, and to scale up local innovations and facilitate information dissemination (Morgan, 1990).

Coordinating structures could be NGO only, or joint NGO-GO. As networks of NGOs begin to emerge at different spatial levels, they constitute one mechanism for such coordination among NGOs. However, if the communication and coordination is to involve GOs as well, a contact with them is necessary. Although networks suffer from problems of bureaucracy and poor representativeness of members' concerns, they are emerging as one of the interfaces between the NGO community and the state. Some informal networks have led to consortia of NGOs established to achieve specific purposes. For instance, while the time and costs implied just to garner information on government plans, let alone influence them, are beyond the resources of smaller NGOs acting alone, larger Indian NGOs acting in consortium have occasionally persuaded GOs to cater to their needs (Sethna and Shah, 1991).

Influencing the policy context of NGO actions: Perhaps the more serious limitation of NGO agricultural development actions stems from their dependence on non-local processes and decisions, which lie beyond their small-scale project focus. When acting independently and avoiding any contact with government, they are excluded from the definition of policies which structure (if not determine) the context in which they operate at a local level, and influence the wider context of rural poverty and agricultural development. Similarly, being unable themselves to finance infrastructure (irrigation, roads and so forth), they are dependent on government programmes.

Although such programmes will likely remain the domain of government (de Janvry et al, 1989), the more general point is that NGO actions are dependent on them. To address this dependence ultimately implies some form of engagement with government in the debates and decision making processes preceding policy and programme choices. While this engagement entails real risks, as noted already, to those who choose to avoid such contacts, the luxury of isolation will come at the cost of dependence.

Implications for NGO Posture to Government

While the foregoing is in part our outsiders' observations of how forms of relationship with government might address limitations of the NGO model, it also draws on NGOs' own statements about their concern to engage in such relationships. Yet despite this interest, NGOs frequently maintain a distance from GOs, and continue to perceive them as repressive, continue to emphasise the sorts of conflicts of interest that we noted do indeed exist, and continue to call for increased levels of state expenditure and action in rural development. Thus, they at once talk of relationships with governments, but adopt postures that frustrate such relationships.

For those NGOs who wish to explore links with government, they will have to rethink their concept of the state's role in society, their attitude towards it, and hence their identity (Clark, 1991:176). This will undoubtedly be a difficult process which threatens the coherence and rationale of these NGOs (Aguirre and Namdar, 1992; Sotomayor, 1991). Nonetheless, it lies at the core of any NGO efforts to define what they expect from government.

Manoeuvring for room: possibilities for NGO-GO relationships

In many respects, by arguing that they need closer relationships with each other, both GOs and NGOs are responding to the recognition of their own limitations. Yet they approach such relationships through perspectives shaped by their histories. GOs still act as if government maintained its traditionally central role in administering rural development; NGOs perceive government on the basis of their traditional oppositional relationship with the public sector.

The NGO-GO relationship will therefore be sometimes conflictive. We have attempted to recognise this conflict. Yet we have also suggested that the mutual recognition that closer relationships might be desirable makes the emergence of such relationships possible. We close with a discussion of some of the types of relationship emerging.

NGOs as Instruments of GO Programmes

Given the large number of NGOs, and the increasing constraints on government ability to implement programmes, there has been a strong temptation to see the NGO sector as a new vehicle for implementing programmes designed inside government. The types of relationship proposed have included the contracting of NGOs to implement government targeted levels of technology transfer (Chile), the delegation to NGOs of transfer actions without any financial resources from government to NGOs (Bolivia), and the allocation of small grants to NGOs to implement small rural projects (as in the proposed 'social funds' in several countries).

When financial resources have been involved, then one segment of the NGO population (the more technocratic, less politicised yuppie NGOs) has accepted such contracts and grants. Indeed, a significant number of NGOs have been created to take advantage of such funds.

However, this form of relationship has been severely questioned by other NGOs of more radical and academic origins, on several grounds. They are uncertain about participating in the privatisation of services that, in their view, should be the state's responsibility. They are also concerned that to participate in such programmes is to be complicit in a policy of structural adjustment with which they disagree. Many argue that if they are to play these implementational roles, they must also be involved in programme design and decision making in order to be able to negotiate the underlying principles. Many also fear that if such relationships become prevalent, NGOs will become no different from rural development consultancies - a form of cooption that would also undermine their identity.

Furthermore, to use only this form of relationship caters only to the pressures of public sector cutbacks, and does little to address either the weaknesses of NGOs, or the strengths that some have in innovation and popular organisation. Indeed, strengths might easily be weakened.

In short, the 'superficiality or clumsiness, and insensitive ... attention' from donors and governments (World Bank, n.d.a:14, para 23; also Sollis, 1991:26), characterised by this instrumentalist approach, is likely to close out room for manoeuvre for relationships between GOs and any other than the most opportunistic and least innovative NGOs.

NGO as Sources of Lessons for Wider Programmes

If one of NGOs' main strengths lies in their experience and capacity to innovate, then one implication is that government might place a strong premium on nurturing this innovative capacity, and then developing means to harvest the fruit of such creativity for wider implementation and incorporation into government programmes.

Such strategies might be pursued at several levels: the simplest would be for GOs to work with technologies adapted by NGOs. Less simple would be to incorporate into GO praxis NGOs' methodological innovations in participation, organisational strengthening and technology dissemination. A more profound change would be to take lessons from NGOs' institutional structure and incorporate them into GOs. This would mean decentralising authority within GOs, thereby increasing the flexibility and adaptiveness of local offices (cf Sollis, 1991). It would also involve structuring local offices of GO programmes along the lines of NGOs' small, relatively informal field offices, while retaining the co-ordinating mechanisms made possible by the overlying institutional structure of the public sector.

The NGO-GO relationships that might facilitate this transfer of experience to the GO sector are several. Among the most feasible has been for NGOs to give training courses to government staff on themes such as project management, participatory methods and farming systems research (Fernandez, 1991). Other mechanisms have involved government in hiring individuals from NGOs in the design stages of new programmes, and in contracting NGOs to do specific pieces of research.

Beyond Instrumentalism: the Scope for Power Sharing, Collaboration and Coordination

The relationships discussed in the previous section are relatively feasible because they do not impinge too greatly on government unwillingness to give up control of decision making on how NGO experiences might be incorporated into GO actions, nor do they involve NGOs too closely in the machinations of government. On the other hand, they still do not give NGOs any voting rights over government programmes. To achieve that would imply creating structures such as advisory councils for public programmes, with representation of NGOs and farmer organisations on the councils.

These sorts of structures are beginning to emerge, creating a space both for a broader based decision making process and for coordination of actions among different types of organisation. In the Santa Cruz area of Bolivia, for instance, NGOs participate in the planning of the annual research programme of the public sector research institute (Thiele et al, 1988). In the current reorganisation of Chile's on-farm research programme, and of Colombia's technology transfer programme, local planning committees involving GOs, NGOs and others have been initiated (Sotomayor, 1991). Beyond being planning and monitoring bodies, these committees have

often assumed the function of coordination of activities, as in a case reported from Kenya (Musyoka et al, 1991).

Indeed, inter-organisational arrangements around local on-farm research and technology transfer programmes seem to be one of the most promising areas in which there is room for manoeuvre in initiating GO-NGO collaborations. One reason is that negotiating the relationship at a local level liberates it from some of the political and institutional tensions encountered when similar efforts are made centrally. Another reason is that such relationships respond to needs perceived by NGOs and GOs alike. For NGOs, a contact with such programmes is attractive in order to: (i) address a frequent problem - namely their poor access to GO technologies, especially improved seed; (ii) gain direct research and technological support; (iii) offer a channel for eventual NGO influence on experiment station research. The attraction to GOs of such collaboration is that the expense of on-farm research programmes makes them early casualties of resource cutbacks (Biggs, 1989; Cardoso et al, 1991). Consequently, a collaboration with NGOs helps them keep such programmes alive.

Towards Multiple Forms of NGO-GO Relationship?

There are, then, many ways in which NGOs and GOs might initiate operational contacts. The most appropriate contact depends in part on the politics of the relationship between government and NGOs, but it also depends on the nature of the NGO. This implies the need for a differentiated public policy, supporting research in some NGOs, but also offering contracts for service delivery to others. Over time, one might expect that different NGOs would find their niche, some as innovators, others as implementers. Ultimately a greater degree of explicit specialisation in the NGO community might emerge: some as applied research centres; others as essentially rural development consultants, contracted to GOs and membership organisations alike; and others as hybrids combining research and contracted implementation.

NGOs and RPOs: the rhetoric

As NGOs are more and more willing to acknowledge, they are shrouded by a rhetoric regarding their relationship with RPOs and the rural poor that often exceeds the reality of the situation (Arbab, 1988:37-42). While this rhetoric remains important as a guiding principle for NGO work, it is equally important to identify the obstacles to it as a first step towards identifying appropriate strategies for donors to remove these obstacles.

So what is the rhetoric? Rural development NGOs argue that their role is to support initiatives emerging from, and voiced by rural people. Furthermore, they argue that any "project" intervention (e.g. a seed delivery project) should be consistent with a long term development strategy which aims - among other things - to strengthen rural peoples' organisations. This is so in order to enhance the capacity of rural civil society both (a) to implement its own development initiatives, and (b) to make links with other institutions in order to (i) gain access to their resources and (ii) exercise influence over their agenda. Consistent with this emphasis on organisational strengthening is the idea that as the RPO becomes stronger the role of the NGO will change. The RPO will take on an increasing share

of administrative, implementation and design responsibilities, and the NGO becomes a hands off advisor providing support when requested by the local organisation (Arbab, 1988; Carroll, 1992).¹¹

On the basis of this rhetoric, an NGO agricultural development programme based on research/extension activities would be conceived within these wider sets of concerns - its objectives would be both the more immediate concerns of adapting and disseminating appropriate technology, and the longer term concerns of building capacity in rural organisations to design and manage their own agricultural programmes, and to exercise pressure on research, extension and other institutions for appropriate forms of support. This is consistent with the roles identified as appropriate for NGOs by the prior discussion of the potentials and weaknesses of rural peoples' organisations.

However, this rhetoric makes many assumptions. For instance, it assumes that:

- the NGO in fact wants to pursue a process in which it passes resources to, and becomes increasingly accountable to membership organisations;
- the NGO has the capacity to provide quality support;
- members of the rural peoples' organisation will have common objectives;
- there is a relatively trouble free relationship between NGO and the rural peoples' organisation;
- the structure of financing for NGOs will enable such an approach.

All these assumptions can be questioned. By questioning them, we can identify obstacles to NGOs' capacity and willingness to strengthen RPOs and some of the possible implications for donor support.

Constraints on NGO ability to match up to the rhetoric: Implications for policy

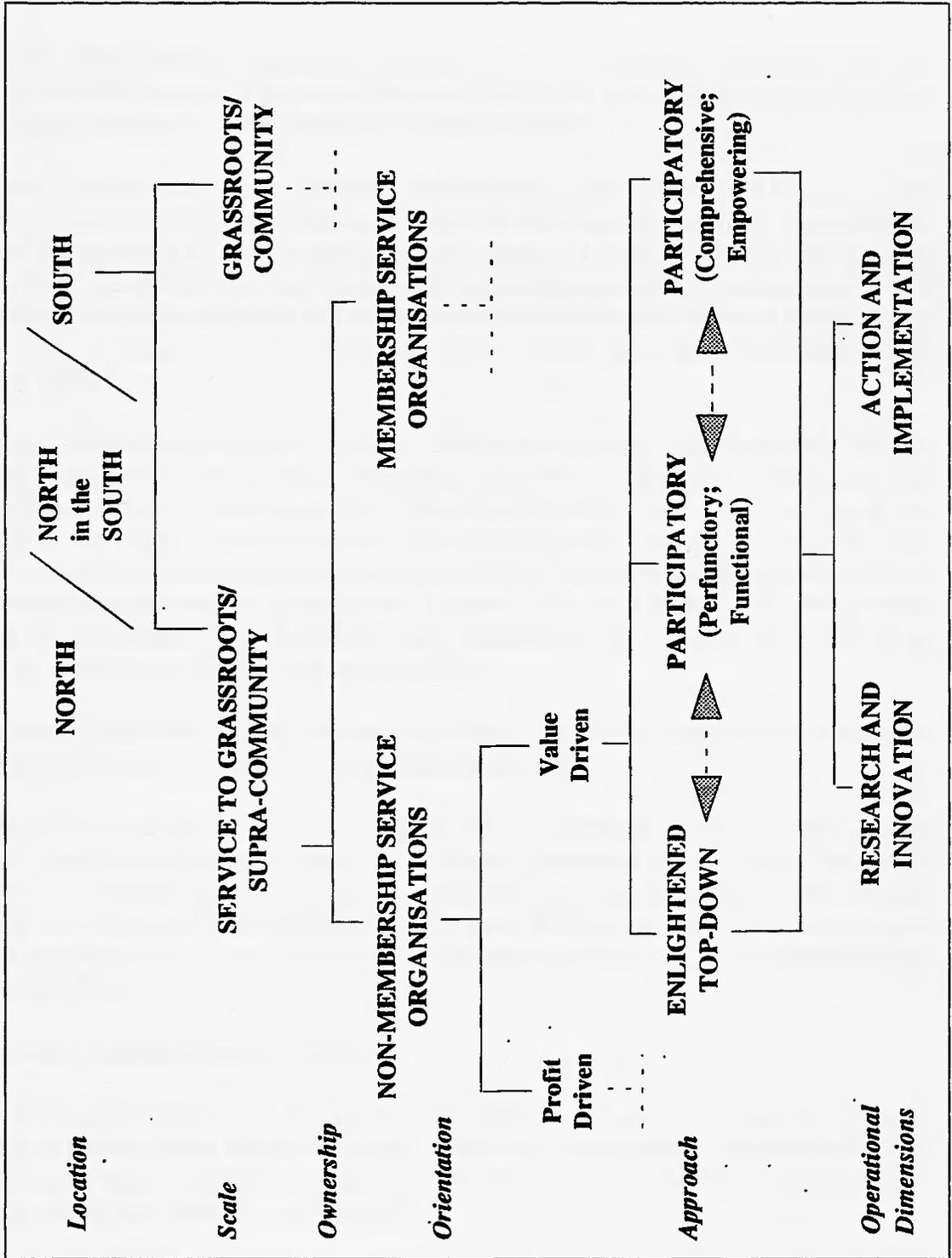
The constraints on NGO capacity to perform the roles identified for them in this rhetoric relate to the nature of NGOs, the social and economic context of the NGO, the nature of rural peoples' organisations, and NGO-government linkages. We take them in turn.

The nature of NGOs

Recent reviews of the indigenous non-membership NGO sector have emphasised the diversity of types of NGO and of their orientation. Figure 1 outlines a number of these differences, of which two are particularly relevant here: that between profit driven and value driven NGOs, and that between top-down and participatory NGOs.

¹¹ This rhetoric is particularly the case for south-based NGOs, but is also true for northern NGOs.

Figure 1. Diversity of NGO Types



Many of the traditional NGOs in developing countries were formed by individuals committed to a certain vision of social change that bore close resemblance to the rhetoric discussed above. These value driven NGOs are to a greater or lesser extent concerned to foster popular participation and the creation and strengthening of RPOs (although some may not be so successful at this in practice and may show top down tendencies).

These are the NGOs with the qualities that many donors are looking to as they become interested in the NGO sector. They are also the type of NGOs most able to work with RPOs so as to address some of their weaknesses mentioned earlier.

Recent years have seen the rise of a different sort of NGO as part of the rapid increase in the number of NGOs in developing countries. Much of this increase has been opportunistic. NGOs have been created in order to gain access to increasing funds for NGOs, and in some cases have been created primarily as an income generating strategy for professionals. In a real sense these are profit-motivated NGOs, driven less by a particular vision of social change and more by a concern to earn (Kaimowitz, 1993; Bebbington and Farrington, 1993; Bebbington 1993a).

Some of these NGOs have little field presence. Others, however, do work in the field, though the methods they use are not especially innovative, and they often conduct extension work with a top-down, contact farmer approach. These sorts of NGO have a role to play in the reorganised research and extension system, and are the types of NGO who will be quite willing to receive contracts from governments or donors to implement extension activities that were previously implemented by government. However, they will be less able, and at times not willing, to work with RPOs to address their weaknesses, nor to work with them so as ultimately to pass control of resources to the RPO.

This structure of the NGO sector implies two things for donor support to programmes reorganising government services in the agricultural sector.

First of all, donors must try to avoid encouraging the proliferation of NGOs. This implies being more rigorous in approving grants and contracts, requiring that the NGO can prove several years of experience and competence. Secondly they must pursue a differentiated strategy - ie one recognising that different NGOs have different strengths, inclinations and approaches to extension. Only some of them are appropriate partners in any attempt to create or strengthen RPOs.

The social and economic context of NGOs

Many of the people who work for professional NGOs are not of a rural or peasant background, or have become rather urbanised. While this is not always, not totally the case, it does mean that rural people tend to perceive of NGOs as being more like the powerful social groups in society than like rural people.

It is also the case that NGOs tend to be self elected and selected, and there are few formal mechanisms through which rural communities can hold them accountable. Similarly, rural people or RPOs are rarely represented on the boards of NGOs.

In addition to these obstacles to the NGO-RPO relationship, the economics of NGO financing also discourages NGOs from in fact pursuing the path that their rhetoric defines for them. Their dependence on project financing discourages them from passing over control of resources and finances to RPOs. Also, the tendency for donors to provide support in short term cycles of project financing, and to want to see visible results at the end of that period, discourages the slower, harder and invisible work of organisational strengthening. Instead, it encourages an emphasis on actions and outputs. It is also a further discouragement to the NGO passing over administrative responsibility to the RPO - for the NGO may well fear that the RPO will administer poorly, pursue other objectives than those agreed with the donor, and thus put a renewal of the project in jeopardy (Arbab, 1988 reports such a case).

Not all these problems are easily influenced by NR policy. However, some recognition of the challenge and slow nature of institution building, and some support to NGOs in helping define criteria for assessing progress in institutional strengthening would assist in addressing the problem mentioned in the last paragraph. Similarly, while the simple presence of RPOs on NGO committees may not be enough to make their work more client responsive, donors could be more demanding that NGOs show the existence of some mechanisms of accountability between them and the rural poor and their organisations.

In the end, though, it must be recognised that there are social and economic reasons why the the NGO-RPO relationship will always remain uneasy. This is all the more so, because not only is there a need to make NGOs more accountable to RPOs, there is similarly a need to make RPOs more accountable to NGOs.

The nature of rural peoples' organisations

Despite some claims to the contrary, RPOs are no panacea of pristine rural democracy (Fox, 1990; 1992). Indeed, as Fox (1992) notes for Mexico, RPOs more often than not get taken over or are at least excessively influenced by a minority - and often relatively elite - section of rural society. Consequently any effort to place resources and responsibility for research and extension in the hands of an RPO runs the great risk that those resources will be channelled to a privileged few, and perhaps used for purposes not intended.

Thus, just as there is a need to make NGOs more accountable to rural people, so too there is a need to make RPOs more accountable. One means of doing this is by increasing the number of sub-groups within an RPO in a way that makes them a constituent part of the RPO (Fox, 1992). This can help give minority interests some voice as Fox (1992) shows in Mexico. Another means - far longer term and beyond NR policy - is to improve the levels of education among the members of an organisation, so that all have the capacity to understand the management of programmes and finances within the RPO (Bebbington et al, 1993). A third mechanism is for another party (who might also be providing the training and helping form new sub-groups) to be involved in the administration of activities and finances. The most likely candidates for such a party are NGOs, or representatives of other institutions such as the rural church.

NGO-government linkages

RPOs tend to have poor linkages with formal research services, rarely have a policy for interacting with research, and lack the types of informal contacts with researchers that are often necessary to initiate more formalised interaction. It is therefore suggested that professional NGOs could help build these bridges. However, as we have already noted, NGO contacts with the state are also often poor. Efforts must be made to improve these linkages.

Government and donors can do much to help improve its links with NGOs (and through them to RPOs) without having to appear instrumentalist in their attitude. Evidence suggests that the most effective way is through making informal contact first, providing information etc on work being done by government research and extension and by asking NGOs to begin commenting on this. Thereafter scope for more formal linkages may be possible (see Kaimowitz, 1993; Bebbington and Thiele, 1993).

CONCLUSIONS

Technology developed by research and extension is more likely to be relevant to small farmer needs when there are close triangular links between farmers, researchers and extensionists. Similarly, technology development will be more effective and relevant when there is increased communication among the members of each of these categories - i.e. among researchers,¹² extensionists and farmers. These links will be all the more effective when they foster open discussion between the people involved.

These links can be built in a number of ways. Possible links that increase interaction and discussion include on-farm trials, liaison units between research and extension, joint research planning exercises etc. The management of these links has been reviewed recently by ISNAR.

It is increasingly recognised, however, that building and maintaining such linkages is costly. In particular, attention has been drawn to the costs of on-farm and participatory technology development, and the difficulty of scaling it up beyond contacts with a handful of farmers. Furthermore, public sector resources to manage such linkages within the public sector are extremely scarce and in many countries shrinking. Consequently, having learnt these lessons about linkage, the current challenge is how to build and manage links not simply between different actors, but also between different types of organisation. Among donors and national research services this challenge has led to interest in the role that rural peoples' organisations (RPOs) and professional non-government organisations can play in "stretching the development dollar" and in making research and extension more effective, efficient, demand oriented and equitable in its impact.

This paper reviews some of the changes occurring in national agricultural research and extension services, and has considered what we know so far regarding the capacity of

¹² Perhaps particularly among researchers involved in different stages of strategic, applied and adaptive research.

membership and non-membership non-government organisations to fill some of the gaps left by a receding public service, and to make a reorganised system more effective.

Evidence suggests that if government researchers and extension professionals coordinate with NGOs and RPOs, this will increase the efficiency and effectiveness of public sector resources. Among other things, working with such intermediaries allows:

- researchers to have indirect contact with many more farmers
- more on-farm trials
- a degree of cost sharing - for instance, NGOs and RPOs can take on costs of supervising trials
- RPOs to participate in research, thus scaling up the coverage of farmer participatory research
- researchers and extensionists to coordinate with professionals with complementary skills (eg in rural organisation)
- more farmer feedback into the setting of research agendas
- some degree of increased access to the poorest of the rural poor (to an extent)

However, evidence in the literature and from AgREN's personal contacts with members suggests that the capacity of NGO and rural peoples organisations falls somewhat short of much that has been claimed for these types of organisations. This is not surprising, and should not be used as a reason for a quick loss of faith in them. Many paradigm shifts in development thought are pushed through by recognition of problems in existing practices (such as government research and extension) and by the promise of an easy and quick solution from other quarters. The paradigm shift is now occurring. It is therefore time to recognise the constraints on the capacities of these new "saviours," and to orient policy and the limited resources available for agricultural development to reduce these constraints.

A first group of constraints relates to the uneven social and geographical coverage of RPOs and NGOs. Such organisations do not exist everywhere. Hence a research/ extension policy that aimed to work only with these organisations as counterparts would be biased against certain areas. It may also be biased against certain social groups as there is evidence to suggest the RPOs in particular may not represent all - or the poorest and most powerless - sections of village society. This implies that in some cases it will be appropriate to form new RPOs to target particular clients. This, however, is not an easy or cost free process, and demands skills that government often lacks. Specialised NGOs could assist in this, contracted in to work with crop researchers concerned to work in areas where RPOs do not exist.

In the interim as groups are forming, and in those areas where, because of an unfavourable socio-economic and political environment, group formation will be complicated, it will be necessary to continue with more orthodox approaches to extension. However, the cost constraints of continuing - for instance - with a T&V approach imply new strategies. Among these the most effective may well be to conduct limited client-oriented research and then disseminate technical ideas and options through communication systems that local populations already use. These range from periodic markets, to transport routes, radios, churches etc. This is another sense in which research and extension can focus less on implementing and more on creating an enabling environment for farmer innovation - in this case, an enabling informational environment that builds on communication patterns that already exist.

A second group of constraints relate to the limitations on NGOs' and RPOs' technical capacity. Their ability to access technical expertise, information and resources is also often weak. In particular, their access to public sector resources is limited. In part this is because a history of distance and some distrust between government and non-government sectors. In present times it is also because government has often approached NGOs somewhat heavily-handedly, and has tried to make use of them rather than work with them as partners.

Government research and extension can also create an enabling environment to assist NGOs and RPOs to address some of these constraints. The essence of this strategy must revolve around government research making itself and its research expertise a resource for NGOs and RPOs. Given the often weak links between government and other NGOs and RPOs, this implies placing emphasis on building linkages and contacts and confidence. Some of the links that emerge should enable NGOs and RPOs to relay needs and research priorities to government. Among the most effective mechanisms for this seems to be a combination of (1) periodic formal research planning meetings with different actors represented, and (2) the maintenance of informal contacts. These latter can be improved by occasional secondment of staff.

At the same time government can refocus part of its extension orientation on providing training to these organisations to strengthen their own professional expertise. Such a role would be fulfilled in two ways: providing training directly where government has the facility, and where it does not, searching out expertise from other national NGOs, private sector agencies, etc. Government thus becomes both a provider of expertise where it possesses it, and a searcher of expertise where it does not. In preparation for such work government would need - ideally in conjunction with an NGO umbrella organisation - to survey the needs of national NGOs and RPOs in order to know the nature of "market" demand for government support.

A more radical option is for NGOs and RPOs to begin commissioning research and training support from government services. This however requires that the organisations have the capacity to prioritise broadly felt research needs, and that they have the funds to commission work. Few organisations have such funds themselves (those that do tend to be involved in relatively lucrative off-farm activities such as processing and marketing). There have been some experiments in the creation of such funds for commercialised agriculture, but to date there is little experience for the small farm sector, though some such funds are currently being proposed (eg in Guatemala). However, it is an option that merits attention.

A third group of constraints are those relating to the institutional limitations on RPOs and NGOs. In many cases they are not as participatory and representative of the rural poor as is often claimed. In addition, they are mostly dependent on external financial resources. This weakens them as institutions. makes them dependent on donor criteria of project success, and can stand in the way of them developing long term strategies.

It is not simple for donor support to research and extension to address these problems, and some certainly go beyond the responsibilities of a natural resources programme: However, there are some things that can be done.

To the extent that more emphasis needs to be placed on increasing client orientation in NGOs, this implies support to increase capacity to conduct PRAs and link them to ethnographic and survey techniques in order to identify needs. Again these are skills that government may well not possess internally. However, government resources can be used to commission training in these areas, and so deepen such capacity within the country. This does not imply creating this capacity in all NGOs but rather strengthening a handful of NGOs with such expertise who will then assist other NGOs and government in such needs identification, in establishing participatory monitoring systems etc.

To the extent that RPOs and NGOs are not representative of the broad spectrum of rural peoples' concerns, research and extension programmes should avoid relying too heavily on any one organisation as a counterpart or as a source of ideas in the planning of R&E. Where possible, farm surveys must continue to be a complementary input to joint planning and participatory planning exercises, precisely in order to pick up on any discrepancies between what the leadership of an organisation claims to be a local need, and needs identified by the local population. Similarly, it is important to encourage continuing relationships between NGOs and RPOs in programmes of R&E in order that each keeps the other accountable.

A final note

The general movement behind current restructuring of public research and extension is for government is to move away from controlling implementation of agricultural programmes. Instead government's role should increasingly become to provide a more supportive environment for other agencies involved in poverty oriented agricultural development. This will not be possible in all cases where these agencies are absent, but where it is possible, government services should become a research and training resource oriented towards strengthening these agencies technically and institutionally. At the same time, it should concentrate on improving the availability and flow of information on a range of technical options among farmers, agencies and government. In this way government will be providing a range of options (or a "basket of choices") to farmers, and strengthening the capacity of intermediary agencies to do the same.¹³

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- ¹³
1. The situation in the public sector is not necessarily any better. An eye on the next election also fosters 'short-termism', and pressures on public budgets mean GOs cannot be sure of the resources they will have next year.
 2. This is the 'scaling-up' concept noted by authors like Annis (1987).
 3. Taken as a population, NGOs have contact with a large number of rural producers. In 1988, NGOs in Chile had as many staff as INDAP (Berdegué, 1990). In 1990 in Bolivia, FAO counted 385 NGOs, 154 in the countryside (FAO, 1990), and other informed estimates suspected the total was nearer 600-700.
 4. Sollis (1991:19) argues: 'The key to converting a disabling state into an enabling one in terms of social service provision is identified in decentralisation policy.'
 5. In South Nyanza, Kenya, the District Forest Officer has been able to act as a focal point for coordination of NGO and GO environmental activities. This contrasts with experience in the neighbouring Siaya District where many of the 26 NGOs with agricultural and agroforestry projects have individual links to government, but the absence of agreed mechanisms of coordination means that overlaps persist.

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**LAND TENURE AND RANGE MANAGEMENT INSTITUTIONS IN
THE CONTEXT OF COMMERCIALISATION**

by
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Rural Resources Management Group
Rural Poverty and Resources Research Programme

RPRRP
Working Paper No 9

January 1994

Funded by Natural Resources and Environment Department, ODA

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PREFACE

This working paper presents in preliminary form two chapters from a book manuscript provisionally entitled *Commercial Change and Natural Resource Management in Pastoral Africa*. The objective of the analysis presented here is to provide a clear, logically elaborated, and empirically substantiated model of the structure of indigenous pastoral land tenure systems. This model purports to account for the various degrees of exclusivity in resource ownership prevailing within customary tenure systems. The analysis assumes that the justifications actors give for their property arrangements are culturally specific, and, therefore, not subject to general explanation. What the model does try to explain is the variable size of the social units which control natural resources.

This issue is examined from two different perspectives. Part I focuses on the internal variability which exists within land tenure systems at one point in time. Different kinds of natural resources - water points, pastures, arable land, trees, etc. - may be held by social units ranging in size from individuals or small groups up to the largest tribal and ethnic units. Part I presents an economic model to account for this variation, followed by case study evidence which largely confirms the patterns of resource control predicted by the model.

The model introduced in Part I is adjusted and extended in Part II to account for the process whereby the tenure rules change over time. It is argued that the value of a resource is not determined solely by its natural properties, but is subject to alteration depending on demographic pressure and demand for the resource, product and input prices, and technical change, among other factors. Case study material in Part II shows that changes in the value of resources can be systematically correlated with changes in the rules for their ownership.

This report does not attempt to draw policy conclusions. Generalizations about indigenous pastoral tenure are difficult to sustain, in that each system tends to be a localized and somewhat unique response to particular institutional and environmental conditions. Likewise, empirical evidence on the nature of customary pastoral tenure systems is difficult to quantify or otherwise summarise in tabular form. Care is required, therefore, if one is to systematically generalize about the nature of African pastoral tenure systems. Accordingly, this report has concentrated on presenting a simple model of these systems and substantiating the validity of the model with ethnographic and historical data. Final policy conclusions are reserved for a later stage in the research programme.

Readers concerned about the policy significance of the material presented in this working paper may consult 'Natural Resource Management in Pastoral Africa' by R. Behnke, forthcoming in the *Development Policy Review*, Volume 12, 1994. This article concludes with a number of preliminary policy recommendations which are based on this working paper, as well as recent research in range ecology.

Both ecological field research and ecological theory now emphasize the efficacy of mobile systems of livestock husbandry in drought-prone arid and semi-arid environments. Combined with the failure of previous attempts to eradicate customary pastoral tenure systems, these new ecological findings have excited renewed interest in officially recognizing and promoting customary pastoral tenure arrangements which make herd mobility possible. But what are

PART I

THE STRUCTURE OF CUSTOMARY TENURE

It is difficult to understand the nature, mechanisms or extent of commercially motivated land privatization without first understanding the position of individual rights within 'traditional' pastoral tenure systems. Part I of this report examines the 'customary' individual entitlements which preexisted and provided the foundation for the emergence of commercial forms of private entitlement.

When there exists no authority capable of securing land rights, individuals cannot own land on their own behalf. Rather, they benefit from membership in a social group which effectively appropriates land. Under such conditions, the sovereignty of the political and territorial group takes precedence over legal title, and political competition, rather than administrative decree or the operation of commercial land markets dominates land transactions and controls the distribution of the human population over the land.

Political insecurity of this kind influences the intensity with which the land is used. Rather than maximizing individual income or rent from the land, rangeland managers are constrained to maximize the number of people that can be sustained on the resources under their collective control. Only in this way can they maintain the numerical strength, political status, and military capacity of the land owning group which secures their individual property rights. Individual economic interests in land may, thereby, be subordinated to overriding political concerns, but they are not dead.

Maintaining appropriate levels of resource exploitation is not the only factor contributing to the survival of the political group; internal solidarity is also important. Having established a claim to territory, the maintenance of internal peace and political cohesion may be enhanced by the institution of rules or conventions which minimize violence by allocating the use of natural resources to group members, i.e., a land tenure system. Such a system of property allocation may be endorsed by the political community as a whole, but the entire community need not use in common the resources under its ultimate authority. Rights to use particular resources or categories of resources can be maintained by the community as a whole, or devolve upon smaller groups of users, or upon individuals. In this analysis we explore the extent to which these proprietary rights - as distinct from rights of territorial sovereignty (Lloyd 1962; Colson 1971) - are individually or collectively exercised in pastoral societies. While the fluid nature of pastoral political organization sometimes blurs the distinction, this discussion focuses on relationships within political units, rather than between such units, on land as property rather than territory.

The analysis begins with a discussion on the nature of property and of the manner in which economic forces structure property relationships. Subsequent sections of Part I apply this theoretical framework to the analysis of case material on pastoral land and water tenure.

these traditional tenure arrangements? If nothing else, the material presented here demonstrates that pastoral tenure cannot be simply equated with 'group' or 'communal' tenure. Consequently, neither the existence of individual property rights nor the extension of those rights through rangeland privatisation provide conclusive evidence of the breakdown of customary systems of rangeland allocation. The DPR article referred to above briefly explores the policy implications of this realization; a more authoritative and methodical statement of recommendations awaits the conclusion of the research programme represented, in part, by this working paper.

The Allocation of Property Rights

In pastoral tenure systems, land is not - on the whole - 'managed' by administrative regulation, but through a process of property allocation. With certain exceptions which are well documented in the literature (for a review see Niamir 1990, Lawry 1990), pastoralists are more concerned to determine who owns property than they are to regulate the use that others make of their property. African pastoralists manage land by using it, and claims to 'regulate' land use amount, in most instances, to a claim of access rights or co-ownership. In management systems of this kind, the distribution of tenure rights - what kind and how many owners possess a category of resources - conveys considerable information about how resources are used. It is this aspect of pastoral tenure - the variable degree of inclusiveness-exclusiveness with respect to the sole or co-ownership of different kinds of resources - which the following analysis seeks to clarify.

The tenure model developed here is based on a body of economic theory termed property rights analysis which traces its intellectual lineage back to the economic analyses of Coase and Demsetz and early anthropological work on American Indian territoriality (Coase 1960; Demsetz 1967; Steward 1955; Leacock 1954). The overall model is presented here as a series of hypotheses; later sections of the analysis will examine the extent to which these propositions correspond to empirically observable patterns of resource control in pastoral societies.

Property as control of a benefit stream

Central to property rights analysis is the notion that property does not consist of things or objects, but rather is the socially recognized right to possess the flow of benefits that arise from the control of things or objects (Furobotn and Pejovich 1972: 1139). If property is conceived of as the legitimate control of a benefit stream, then it is also reasonable to treat the maintenance or establishment of such control as a productive activity fundamentally similar to other forms of economic behaviour. Property rights analysis thereby redefines and expands the range of problems that can be subjected to economic analysis. Such analysis routinely assumes the existence of a particular property rights system and focuses attention on economic decision-making within the context of that system. Property rights analysis asserts that it is possible to scrutinize the property system itself in terms of the principles and techniques of marginalist economic analysis.

In particular, it is assumed that the amount of effort or resources which will be devoted to the maintenance of property rights will depend on the balance of costs and benefits which can be expected to accrue to the holders of those rights:

Establishing and protecting rights is very much a productive activity to which resources can be devoted. But like any other activity, the amount of investment will depend upon the marginal benefits and costs to investors of allocating resources to these endeavours (Anderson and Hill 1977: 202).

Rent and transaction costs

'Benefits' of resource control may be more precisely defined as the economic rents derivable from a particular property right (Behnke 1994). In the absence of regulatory mechanisms which control rates of resource use, the benefits which accrue to an individual property user are sensitive to the number of such users. Following Cheung (1970), the more exclusively a resource is owned, the more rent each user will capture.

'Costs' of resource control correspond to what economists term transaction costs - the costs of defining, transferring, and - most critically - defending or policing property rights. Assuming that individual producers bear the 'exclusion' costs of defending their property rights from 'illegitimate' users, exclusion costs - like economic rents - are sensitive to the size of the property ownership group. Following Cheung (1970), the more exclusively a resource is owned, the higher the exclusion costs born by each individual owner, as an ever smaller ownership group is called upon to defend its property against an ever larger number of excluded but potential users.

This argument is presented graphically in Figure I.1, where the vertical axis represents the level of costs and benefits which arise from attempts to control a resource, while a rightward movement on the horizontal axis denotes an increasing level of activity devoted to the establishment and enforcement of those rights. As enforcement activity increases, marginal benefits (the incremental gain derived from each additional unit of enforcement activity) will tend to fall while marginal costs will tend to increase, giving the slopes of the benefit and cost curves in Figure I.1. The level of enforcement or policing activity in any given situation will be determined at the point where the marginal cost and benefit curves intersect, for beyond this point the increasing benefits of additional enforcement are more than offset by the increasing costs of such enforcement.

The economic efficiency of tenure systems

Two general kinds of changes will promote a change in the level of property rights enforcement: a change in the marginal cost or the marginal benefit curve. These changes are schematically displayed in Figure I.2. As an example of such changes, we may cite the development of a commercial market in animal fodder in an area where fodder had previously been plentiful and free to all users. Commercial developments of this kind would tend to increase the returns to successfully obtaining fodder, and consequently shift the marginal benefit curve from MB to MB1, shifting the level of 'enforcement activity' from point 1 to point 3 in Figure I.2. A similar effect would be produced by any change which would lower the costs of enforcing private property rights. Anderson and Hill (1979) provide an appropriate pastoral example of such a shift: the introduction of cheap barbed wire into the open-range ranching areas of the American Great Plains, where fencing material had previously been scarce and expensive. Graphically, such a change would be represented by moving the cost curve from MC to MC1 in Figure I.2, thereby promoting (even at stable prices) an increase in enforcement activity from point 1 to point 2.

In terms of the above argument, 'the structure of property rights in productive assets is a dependent variable' (Bromley 1989: 15), with the degree of exclusivity governed by shifts in the marginal costs and benefits of resource control. An efficient property rights system, in

Figure I.1: Costs and Benefits of Controlling Property

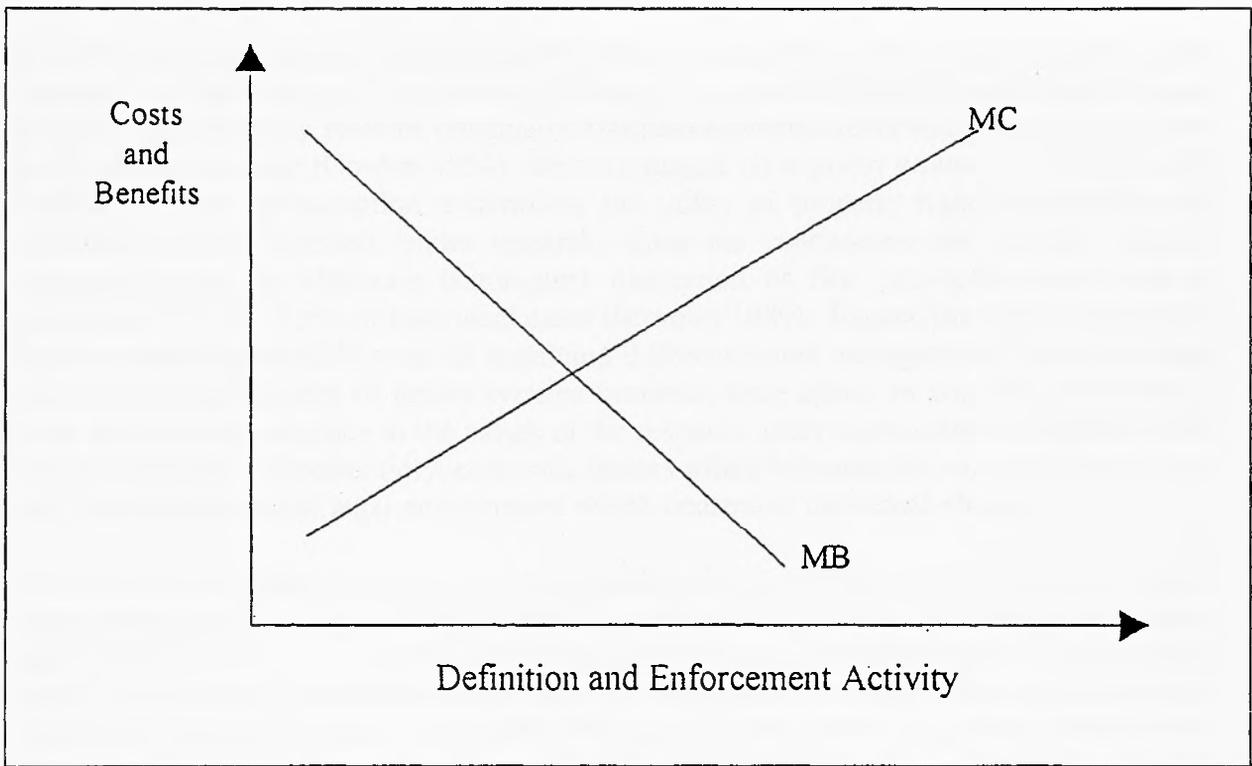
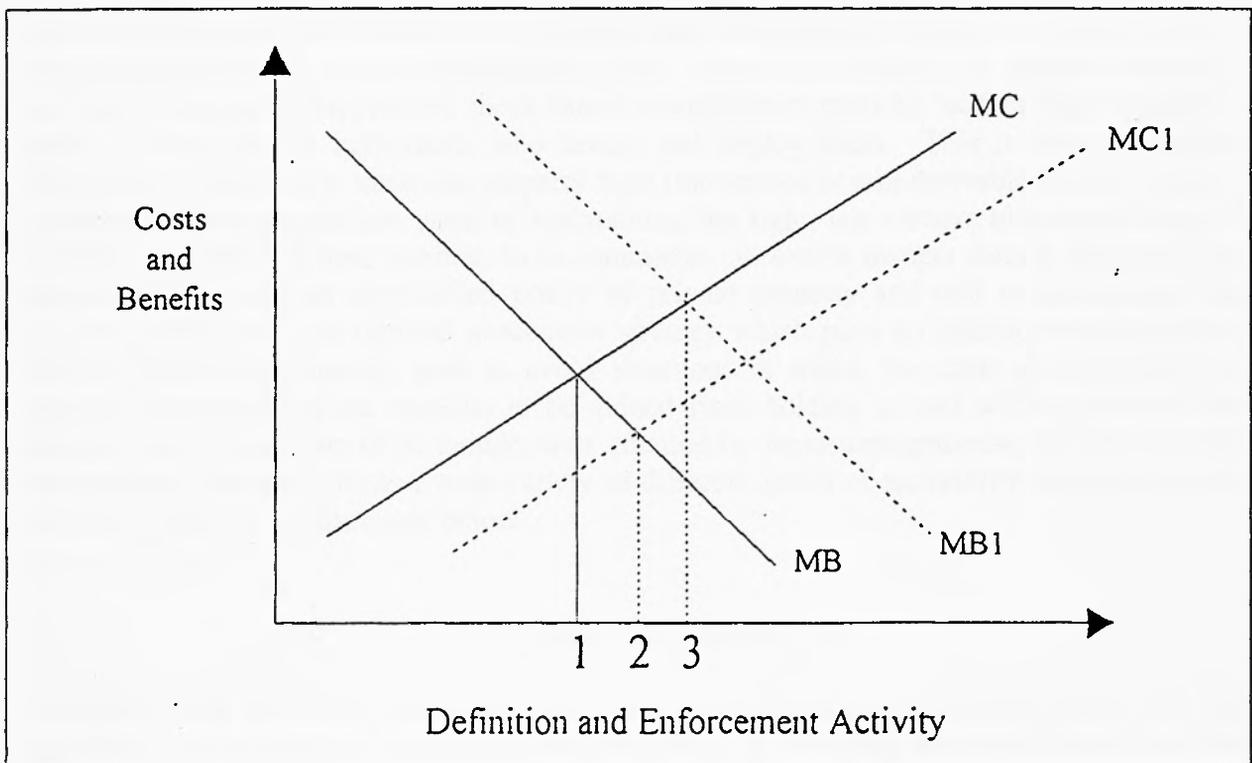


Figure I.2 The Effects of Changing either Costs or Benefits



the analytical framework proposed here, is one which maximizes the net benefits (economic rent less transaction costs) as distinct from the gross benefits (economic rent) derivable from property.

This definition of economic efficiency differs from that routinely employed in property rights analysis. In these analyses, economic efficiency is equated with rent maximization; since non-exclusive property systems potentially dissipate economic rents and potentially increase levels of resource use (Gordon 1954), they are judged on *a priori* grounds to be inherently inefficient. This presumption undermines the utility of property rights analysis for the conduct of policy-oriented tenure research; since the conclusions are forgone, research degenerates into an elaborate tautological illustration of first principles rather than an examination of the merits of individual cases (Bromley 1989). Expand the analytical problem to incorporate the variable costs of sustaining different tenure arrangements, and assessment of the relative efficiency of tenure systems becomes, once again, an empirical undertaking, to be settled with reference to the nature of the resource under examination, technical factors which determine its productivity, economic factors which influence the value of its output, and the larger political and legal environment which constrains individual choice.

Even more interesting, however, is the possibility that actors may themselves be forced to expand the calculus of their strategic thinking to incorporate what are essentially institutional and political issues. One of the primary functions of any government is to enforce property rights; in a modern state, government bears at least some of the direct costs of defining and defending legitimate rights. Since the meeting of these costs is a public responsibility, specialists - professional economists armed with alternative definitions of the efficient - enter the public arena to debate policy.

But the pastoral tenure systems we are dealing with here have evolved in the absence of centralized government authority, in conscious opposition to such authority, or simply exist in the interstices of formal administrative systems. Since they receive little outside assistance and may be actively suppressed, these tenure arrangements must be 'self-funding' from the point of view of the individuals who invent and deploy them. This is to say that the advantages of holding a particular property right (the economic rent derivable from that right) must exceed the transaction costs of maintaining the right, lest owners ultimately find the political economy of their position to be untenable. Resource owners cannot, therefore, be expected to pursue an unqualified policy of private property and rent maximization, the tenurial analogue to an optimal production strategy which pays no attention to production costs. They may, instead, seek to avoid situations in which the costs of maintaining a property right exceed the benefits to be gained from holding it, and willingly accept the division and dissipation of economic rents entailed by these arrangements. Calculations of this sort are likely to create a wide variety of different levels of exclusivity within even one tenure system, as is discussed below.

Structure and change

Figure I.2 may refer to a single resource - let us say rangeland in a particular area - and the different tenure practices which evolve over time as changing technical, economic and legal/political factors affect the exploitation of that resource. The model is therefore

equipped, in principle, to address change in land tenure systems.

Equally, however, Figure I.2 might refer to different intensities of property control which coexist within a tenure system. In this case, the costs and benefits of resource control represented by the lines MC, MC1, MB and MB1 would refer to different resources such as watering points, arable field sites and rangeland, and points 1,2 and 3 would indicate the different levels of tenure enforcement activity associated with these different resources. Viewed in this light, the model would purport to explain not changes in tenure arrangements but rather the internal variability within property systems which encompass different kinds of natural resources and assign various levels of property rights to these different resources. The model also predicts the kinds of resources which are likely to be held on a more or less exclusive basis within these mixed systems of open access-communal-individual tenure. This pattern has been elegantly described by Netting, based on a world-wide review of the agricultural tenure literature:

Resources that are needed by all but whose productivity is diffuse rather than concentrated, low or unpredictable in yield, and low in unit value tend to be kept as communal property with relatively equal, although not unrestricted, access by group members. Smaller, easier divisible, and more highly productive areas may be owned and inherited by individuals. (Netting 1982: 471).

The remainder of Part I of this report examines the extent to which the preceding generalizations provide a useful and informative guide to the structure of a number of pastoral African tenure systems.

Indigenous Pastoral Tenure: Open Access, Communal and Private Use

The preceding property rights model avoids categorizing pastoral tenure systems into the standard ideal types of open access, communal and individual tenure. Analyses which rest on the abstraction and simplification of the form of tenure systems have been made unnecessary. They have been replaced by an attempt to specify a limited set of causal factors which generate a diverse array of tenure systems of mixed and variable degrees of exclusivity and openness.

The land tenure systems of the Cyrenaican Bedouin, Karimojong and pastoral Somali provide the first three case studies presented here. Territorial rights of sovereignty are a collective affair in all these societies; the exercise of economic interests and proprietary rights, as we will see below, presents a more varied and complex picture. At least in these three societies, individual tenure is not new, inconsistent with or a result of the breakdown of traditional political organization; it was there all along.

Two additional case studies - on the Borana of Ethiopia and Berber pastoralists of Morocco - and a more superficial but broad review of literature are provided as further illustration of these patterns.

The Bedouin of Cyrenaica, Libya (circa 1974)

The customary tenure arrangements discussed here partitioned resources on the inland slope of a Mediterranean coastal highland, the Jebel Akhdar of Cyrenaica, Libya. Adjacent to the coast, the Jebel Akhdar attains an elevation of over 800 meters and receives an average annual rainfall of about 500 mm. Over a distance of about 80 kilometres as one moves south onto the Saharan steppes, elevation falls to less than 200 meters and annual rainfall declines to about 100 mm. Bedouin tenure arrangements in this area therefore encompassed resources of considerable variability, for pastures, field sites and water points possessed both distinctive productivity characteristics and different relative values for producers depending on the harshness of the area in which they were situated. Because of this variability, the Saharan slope of the Jebel provides an ideal setting for studying the way in which the productive characteristics of real property influence the terms of its ownership (Behnke 1980).

Figure I.3 illustrates the way in which differences in the productivity of the landscape were systematically correlated with changes in Bedouin pasture and arable land rights, beginning at the top of the table with resources which were highly and reliably productive and concluding at the bottom of the table with those which were either unproductive or erratically productive.

Irrigated garden plots, the most productive and intensively used arable land, were for all practical purposes owned as freehold private property since they could be bought and sold, although such transactions were, strictly speaking, illegal in terms of both customary usage and Libyan national land law. The next most valuable category of arable land consisted of rainfed fields in high rainfall zones and alluvial or flooded fields in low rainfall zones. These field sites were also private property in that they belonged to whoever cleared them, ownership was inheritable and abandonment or fallowing of the fields did not jeopardize these rights. These fields were not, however, bought or sold.

As one moved south onto the steppe, the level of private control over a rainfed field site became increasingly tenuous. In the transition zones between mountain plateau and steppe individuals still owned the sites they had cleared, but this ownership had to be reinforced by continuous use. Fields which were not used regularly were assumed to be abandoned and could be legitimately appropriated by a new user. This pattern of transient use was most marked on the steppe itself. In these zones the distribution of rainfall was so erratic that it did not pay to own fields at all. The Bedouin instead waited for rain to fall at the beginning of the ploughing season, and then raced off to plough wherever the first rains had been strongest. These desert fields were reallocated each season on a first-come-first-served basis, and individuals or households controlled a plot from ploughing until harvest time, but they had no residual rights over the plot itself.

As exclusive individual rights over fields declined, there was a parallel increase in the size and territorial extent of the descent unit within which the Bedouin calculated potential rights to land. On the mountain plateau where agriculture was reliable and fields were privately owned, individuals could open new fields only within the territory of their immediate descent group. As one moved south onto the desert, ever larger tribal sections provided the limits within which individuals could search for fields, to the point that there were virtually no restrictions on individual choice in the desert areas where rainfall was most erratic.

Legally, access to pastures was open to all users. *De facto* access to the most productive pastures was, however, accomplished through restricting access to water sources in the dry season when grazing was scarce.

The conformity of Bedouin land rights to the predictions of property rights analysis is clear. Individual rights to sell or inherit cropped land or control fallows increased as the value of the field increased. Ever smaller kinship units asserted their rights to reserve field sites for their members in productive areas, and were increasingly willing to forgo these rights in less productive areas. The rationale behind this arrangement is reasonably clear. The effort that individuals or communities were willing to expend to control a piece of property was directly proportional to their estimation of its worth. Rights of access to pasture, it should be noted, were the least controlled or restricted of any form of land rights, reflecting the unpredictable and scattered distribution of good grazing, which was dependent upon the vagaries of the rains.

The Bedouin system of permanent water point tenure is presented in Figure I.4. Figure I.4 shows that, contrary to the pattern of arable field and pasture allocation, it was the largest, most reliable and productive water points which were communally operated, while small and relatively insignificant sources were privately owned. Small watering points, and especially those which were situated in areas where water was relatively abundant, were owned by individuals who were entitled to sell this water or reserve it for their private use. Large water points were owned and operated by large groups, the water was shared, and the larger the water point the more extended the group of co-users.

The explanation for this pattern lies in the uniform importance of dry-season water in a desert economy. Variations in the system of water allocation are best explained not in terms of the value of the resource, which was invariably high, but in terms of the variable costs of maintaining exclusive control over that resource. In terms of property rights theory, we must shift our attention (in Figure I.2) from the marginal benefits to the marginal costs of control.

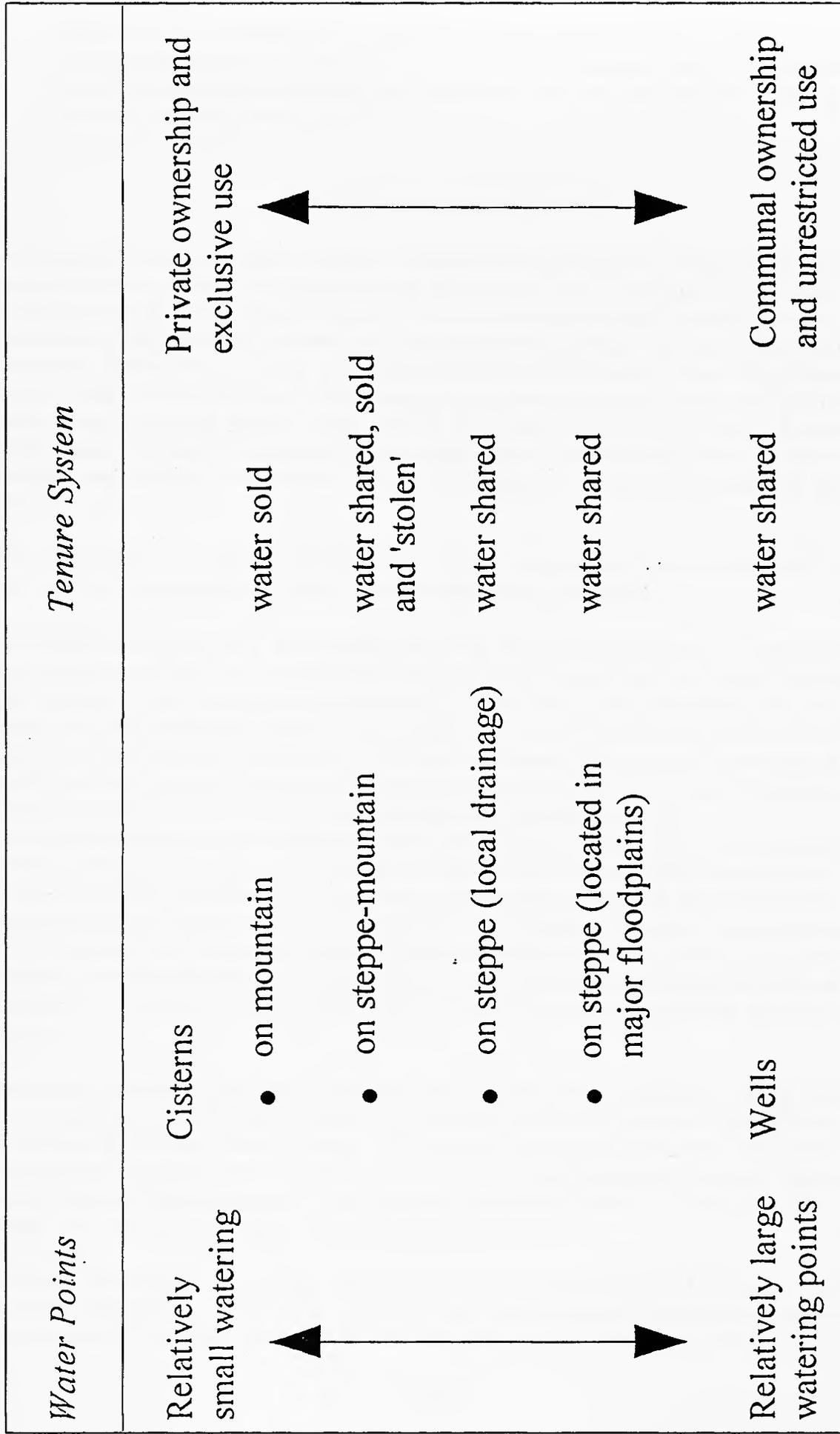
The more significant a water point, the more potential users it was likely to attract and the more difficult it was for any individual or group to deny them access. Ownership of a water point was also contingent upon successfully defending it, but individuals and groups had little motive for assisting in the defense of a resource which they could not also use. Considerations of political and military strategy therefore dictated that larger water points were owned - and defended - by large groups, or used by several allied groups none of which could expel the other. In terms of property rights analysis, the larger the water point the greater the costs of enforcing exclusive access, and the lower the probability that such exclusion would be successful. In this case, collective water ownership was an outgrowth of the operation of a local-level political system which constrained individuals to protect their individual rights through joint participation in larger political units which could successfully defend such rights.

In sum, Figures I.3 and I.4 exemplify the abstract principals displayed in Figure I.2: Bedouin land and water tenure conforms to the expectations of property rights analysis. Put somewhat differently, for the Bedouin as for the European peasants studied by Netting 'land use by and large determines land tenure':

Figure I.3: Pasture and Arable Land Ownership in Cyrenaica

<i>Land Type</i>	<i>Tenure System</i>	Permanently owned and restricted access
Stably productive	Irrigated garden plots	bought and sold
▲	Unirrigated field sites	▲
●	on mountain plateau or in major floodplains on steppe	permanent ownership & inheritable
●	on steppe-mountain boundary	ownership dependent on regular use
●	on steppe (local drainage)	rights to crop, not field site
Erratically productive	Pastures	Irregularly used and unrestricted access

Figure I.4: Water Point Ownership in Cyrenaica



In the absence of decisive legal or military controls from the larger society, the system of property rights in the peasant community will be directly related to the manner in which resources are exploited, the competition for their use, and the nature of the product produced (Netting 1976: 137).

Karimojong land tenure (1950s)

Karimojong country consists of a series of internal drainage systems controlled by the tribe over their entire course - from their origin in highlands to their termination in swamps. The heads and tails of these drainage systems - the eastern highlands and western swamps - are suitable only for pasturing livestock and provide seasonal grazing. In their middle sections the water courses take the form of meandering, seasonally flooded rivers. In this central riverine zone there is abundant alluvial soil suitable for farming and sources of permanent water accessible from shallow wells dug in the sandy beds of the rivers. Permanent agricultural settlements - inhabited by the young, the old and women - occupy the central riverine zone. Mobile cattle camps - manned by young men - exploit the peripheral grazing areas.

The organization of Karimojong land tenure reflects the dualistic distinction between centre and periphery, settlement and camp, farming and livestock husbandry.

In the settled farming zone, Karimojong recognize what Dyson-Hudson has termed 'rights over real property - or over vital natural resources where regular use has created a notion of lien arguable as the ownership of real property' (1966: 219). Thus, cultivated field sites are owned by the individual women who work them and, if fallowed, can be reclaimed irrespective of the length of time they have been abandoned. The individual ownership and use of enclosed grazing for calves is also recognized, especially since these enclosures are routinely located on fallow fields which are already claimed (Table I.1).

Also within the settled zone are located the only permanent territorial units within Karimojong society; these are, in order of ascending size, the neighbourhood, sub-section and section. Neighbourhoods, composing up to a dozen individual settlements, are the point of entry for all households wishing to acquire local rights in land or water. If suitable unclaimed land is available, new field sites are allocated to a newcomer after discussions among the settlement heads in a neighbourhood. Neighbourhoods also control the water-bearing stretch of river bed adjacent to their settlements, and maintain and share in the use and up-keep of these water points:

In areas of permanent settlement, continual use of a given water supply by a group develops into a modified form of ownership...I say 'modified ownership' because rights in water are pre-eminently rights of priority of use. Where water is plentiful, the 'owner' of a water-hole has no objection to its use by herds on the move, provided permission is asked. But to use water supplies without permission is considered grounds for public dispute....and if water is scarce may lead to stick fights (Dyson-Hudson 1966: 112).

Sections, of which there are ten in the entire tribe, are the largest internal territorial divisions within the Karimojong. Aside from private calf enclosures, sectional boundaries in the settled zone constitute the only limitations on the free movement of livestock within Karimojong.

Table I.1: Karimajong land tenure

<i>Ownership unit</i>	<i>Type of property</i>	<i>Conditions of use</i>
	C e n t r a l s e t t l e d z o n e	
Individual	cultivated fields	owned by the women who cultivate them
	fallow fields	individually claimed irrespective of period of fallow
	calf enclosure	individually claimed - usually resting garden land
Neighbourhood	potential field sites	allocated by negotiation within a neighbourhood
	permanent water for settlements	shared, maintained and owned in common by a neighbourhood
Section	pastures within sections	reserved for use by section members
	pastures between sections	free passage to members of neighbouring sections; cattle camps but no settlements permitted
	P e r i p h e r a l g r a z i n g a r e a s	
Camp cluster	temporary stock water	open access but groups of camps control sources during periods of shortage
Tribe	pastures	tribal usufruct, non-karimojong excluded

Source: Dyson-Hudson 1966

Because of the need to reserve grazing around settlements for the milking cows used by local residents, grazing within sections is generally restricted to the use of section members. The borders between sections are open to grazing by neighbouring sections, but no permanent settlements are allowed in these areas.

In the settled zone, in sum, there is a general tendency to allocate the ownership and use of productive, compact and easily controlled resources (cultivated or fallow fields and calf enclosures) to individuals in the first instance, or to small neighbourhood groups (unclaimed field sites and communal water sources); resources which are less productive, extensive and/or difficult to control (unenclosed pastures within or between settled areas) are under the management of sections, the largest territorial units within Karimojong society.

A different pattern of land use and tenure prevails on the peripheral grazing grounds; as the Karimojong say, in the dry season 'The sun mixes us.' Because the natural environment is subject to unpredictable variability, herders cannot foresee the pattern of their herd movements from year to year. This results in the formation of livestock camps of variable and unpredictable sectional membership, as herders meet opportunistically and cooperate on a temporary basis. This flexibility is possible because peripheral pastures and water sources are open equally to all Karimojong. The one exception to this rule occurs in drought years when water is scarce:

Stock-owners tend to move their camp-herds in relation to individually favoured water sources. This is in part the product of experience and the individual's desire to utilize areas that he has come to know with minute thoroughness. But in part it is preparation to claim - in times of shortage - access to water as a moral right, based on his continual use of particular places over a period (Dyson-Hudson 1966: 59).

In drought years, camp-mates are expected to stick together to defend their temporary collective rights on a first-come-first-served basis, even if this means opposing the interests of kin, permanent neighbours and fellow section members who happen not to be members of the camping unit. Unpredictable and temporary scarcity, and a consequent increase in the value of water, thereby promotes a redefinition of the conditions of access to water and increased restrictions on freedom of access. The open rules on camp membership combined with the injunction to camp solidarity may therefore be seen as a response to a resource which is erratic in its distribution but, occasionally, extremely valuable.

As in the Cyrenaican Bedouin case, Karimojong land tenure is broadly intelligible in terms of property rights analysis; the overall distinction between centre and periphery, as well as the variable precision with which different kinds of resources are allocated, reflects the reliability, productivity, size and location/military security of the resource in question. The only really novel element is the system of allocating peripheral water sources - as the scarcity and, hence, the value of water shifts along a temporal axis, so does the care with which the Karimojong define and defend these rights.

Land tenure in northern Somalia (1950s)

The pastoralists of Northern Somalia never permit themselves to forget that collective, political interests in property - what we have termed rights of sovereignty - underpin all individual proprietary rights. This is most clear with respect to pastures:

In the area pastured by its livestock no clan or lineage has a specific title to grazing backed by ritual or mystical sanctions. Pasture is not subject to ownership but the right to graze in an area depends upon its effective occupancy. For ultimately, the final justification for remaining in a region of pasturage is the power to repulse invaders by force (Lewis 1966: 49).

Thus, in the grazing areas, not even large corporate groups like clans occupy 'determinate territories;' instead 'usage backed by effective fighting potential, and now administrative recognition creates some degree of customary association with particular areas' (Lewis 1966: 49).

With respect to permanent water points and permanent agricultural settlements, this 'degree of customary association' is allowed to blossom into what Lewis characterizes as an 'ill-developed sense of territorial extension' (1966: 51), as well as individual proprietary interests in particular pieces of real estate. Thus, in the settled farming areas of northern Somalia, the development of contiguous lineage territories is matched by the recognition of the private rights of lineage members to use individual fields (Lewis 1966: 121).

It is with respect to the ownership of water, however, that Somali political thinking recognizes the greatest degree of permanent corporate or private interests in natural resources:

God provides pasture and man uses it. Wells, on the other hand, except where water is extremely plentiful and easy of access, are not only used by man, but also opened and maintained by him. By their labours specific watering rights are conferred on the individuals and groups who initially dig and subsequently keep them in repair. Thus in all cases of contested ownership, claimants lay stress upon the energy, labour, and expense involved in their construction....Titles to water are established and made known to all. Yet despite their existence and wide recognition, in the last resort such specific rights to water can only be upheld by force of arms (Lewis 1966: 49).

As in Cyrenaica and among the Karimojong, the degree of control exercised over a water point in northern Somalia depends on the kind and location of the water source. With respect to the availability of water and pasture, the northern Somali recognize three distinct ecological zones: a coastal plain where water is abundant but pasture is scarce, an interior plain with excellent grazing but no permanent water sources, and, separating these two zones, a highlands with good sources of permanent water and good pasture. Different kinds of water points and different terms of ownership are characteristic of each of these zones (Table I.2).

On the coastal plains, 'water is so easily obtained [from shallow sand wells] and so abundant, that specific rights of use are seldom maintained' (Lewis 1966 33). At the other extreme, in the interior plain where individual water points are small scale, water is scarce and can only be obtained at the expenditure of considerable labour (in the case of shallow wells) or money

Table I.2: Ownership of water sources in Northern Somalia

<i>Ecological Zone</i>	<i>Type of Water Source</i>	<i>Access Rights</i>
Coastal plains - water abundant but pasture scarce	shallow and temporary sand wells	specific rights seldom maintained
Highlands - primary source of permanent water	wells of medium depth	owned by shallow lineage groups
	deep wells	owned by clans or lineage groups
	deep wells in areas of abundant water	exclusive rights not asserted
Interior plains - no natural sources of year-round water	temporary natural pools	open access
	shallow wells	individuals or brothers claim exclusive rights
	water tanks	privately owned

Source: Lewis 1966

(for the construction of tanks), sources of water are either privately owned or controlled by small groups of kin. In the intermediate highland zone, ownership is determined by the amount of water produced and the difficulty of obtaining it from different sources. Relatively shallow 'mud' wells are operated by small lineage groups; deep wells, which are more productive but also more difficult to clear and maintain, are the property of clans and larger lineage groups, although water may be sold to non-owners. Only in areas where water is unusually abundant are exclusive rights not asserted over deep wells.

*Water and pasture management among the Borana of Ethiopia
(circa 1975 to 1980)*

Table I.3 summarizes Borana pasture and water control practices in the late 1970s, based on Helland (1980, 1982). In Boranaland, as in the previous case studies, there is a systematic relationship between the reliability and productivity of a resource and the tenure rules which pertain to it.

The formal rules regulating access to Borana pastures are simple: 'Pasture is free and cannot be monopolized by any particular group or person, with the proviso that the lactating herds which are kept near the homesteads and brought back for milking every night have priority over the more mobile dry herds (Helland 1982:247).¹ This flexible tenure system reflects the unpredictable and scattered distribution of good grazing, as a consequence of erratic rainfall patterns.

In practical terms, however, these simple rules are strongly modified by limited water supplies and the distances which cattle can travel between grazing areas and water sources. Borana recognize three different categories of water point, and have evolved different tenure arrangements pertaining to each:

- i. Occasional water (*lola*) includes floods in dry river beds, natural rainwater pools and puddles, all of which last for only a few days and are scattered over an extensive area. The rules pertaining to these sources of water are similar to those relating to pasture: no individual or group has special rights, although lactating herds have priority over satellite herds when pools occur in the vicinity of settlements.
- ii. Temporary water (*hara*) includes natural, constructed or improved basins which are more reliable than temporary sources and can retain water for several weeks or months; they also require at least minimal maintenance in the form of thorn-bush fencing and periodic excavation to remove silt. With respect to ownership and control, 'A *hara* is not subject to quite the same regulations as a permanent well, but much more so than *lola* water....The more reliable and seasonally recurrent a *hara* is, the more work goes into improving and maintaining it, the stricter the regulation of its use becomes, and the more it is treated like a permanent water point, i.e. the deep wells that are found scattered in central Boranaland' (Helland 1982: 249).

¹The following analysis of Borana range and water tenure is based exclusively on Helland 1980 and 1982, and refers to conditions between about 1975 and 1980.

Figure I.3: Borana pasture and water control

<i>Resource category</i>	<i>Productive characteristics</i>	<i>Labour required to maintain resource</i>	<i>Access rules</i>
Pasture	fleeting resource	none	open
Riverbed floods, rainwater pools	fleeting resource	none	open
Natural, constructed or improved basins	temporary resources	significant	restricted; rudimentary communal management
Deep wells	permanent resource	very high	carefully regulated; elaborate communal management

Source: based on Helland 1980 and 1982

iii. Permanent wells (*ela*) are the focus of both Borana pastoralism and social life, and are 'without comparison, [their] most vital ecological resource.' (Helland 1982: 249). The labour of excavating, maintaining and using these wells is prodigious. Simply lifting water from the wells can require work crews of 15 to 20 men, while few are shallow enough to be worked by less than five men (Helland 1982: 251). The wells must also be maintained when in use and annually repaired. In sum, 'The physical structure of most wells necessitates, for even a single bucket of water to be drawn, a labour force that is larger than a single management unit is able to supply. A stable and coordinated labour supply is essential to keep the wells going, and must involve cooperation between different units. A breakdown of relations between cooperating units is thus detrimental to everyone involved' (Helland 1982: 255).

The ownership of the well, the institutions which manage its maintenance and use, and the rules which regulate access to its water are complex. For the purposes of this discussion, it is sufficient to note that each well is identified with a particular individual and through that individual the well is also identified with a clan.² Clan elders oversee the proper operation of the well, as does a separate well council which delegates the daily management tasks to council officers. Access to the well is contingent upon participation in the well council and in the work of well maintenance and use. Rights of access are also determined by Borana customary law which is, however, 'not clearly codified in rigid bodies of rules and regulations....The customs and laws of the Borana, particularly in the context of water, may thus be said to be just what the [council] decides they should be' (Helland 1982: 253). In the final analysis, access to water is dependent upon rhetorical and political skill.

²Helland's account of water control is broadly similar to Baxter's summary of the situation:

All natural pans and watering places which have not been improved by the labour of man belong to God, i.e. are of open access to anyone and their stock....But, most vital dry season water has been man dug or at least man improved. Where a man has worked he has priority rights in that water. Wells dug in water course beds have to be redug each year and so rights are extinguished each year and have to be reasserted each year. In effect they are sites where water is regularly found and are not 'property'. But there are a number of deep wells which have been cut through the solid rock, digging of which is a great and chancy labour....If the well fills and the initiator carries out the correct sacrifices he establishes himself as 'Father' of that well. He will talk of 'my well'. Before a well can be drunk from, certain ceremonies have to be performed by its Father....All those who have assisted with the digging, (or their representatives) and all the locally resident members of the clan of the Father should attend. All persons who eat of the bull of the sacrifice and their heirs share in the water rights of that well. The right extends to all clansmen whether they are at the ceremony or not....The rights which all the eaters of the sacrifice acquire are shared by all the members of their homestead...and are transmitted to all their heirs and so rapidly become widely diffused. Wells more than a generation old, and almost all were older than that, no longer had remembered 'fathers' and were known simply as Boran wells or clan wells (1966: 124).

Among the Borana, formal rights of access to rangeland are relatively unrestricted, reflecting the erratic productivity of any particular area in any particular year. The formal rules really pertain, however, only in the wet season when grass is relatively plentiful and rendered broadly accessible by the presence of temporary water sources which, like the range itself, are erratically productive and open to all. As good grazing becomes relatively scarce and more valuable with the onset of the dry season, *de facto* access to pasture becomes indirectly restricted through the rules which restrict access to more permanent water sources. The Borana therefore manage rangeland use, but only indirectly and only during periods of relative scarcity.

What the Borana do manage closely and conscientiously are their deep wells. The communal organization of this management is immediately intelligible in terms of collective benefit (Wade 1987). No single individual or household could effectively maintain and exploit the wells; individual benefit rests on joint action, and elaborate rules and institutions have evolved to promote coordinated action and exclude individuals who attempt to obtain a free ride, or free water, at public expense.

Western High Atlas, Morocco (early 1980s)

Table I.4 summarizes the various forms of forage-land tenure recognized by Berber-speaking agro-pastoralists in the Imenane Valley of Morocco (Mendes 1988, 1991). In the table different tenure arrangements are arrayed along a gradient from more to less exclusive control, by either individual or communities. Table I.4 also summarizes the important characteristics of the various types of land which are subject to alternative tenure arrangements.

According to Mendes, there is a correlation between the value of a particular kind of forage land, and the size of the group which owns that land. The more valuable the land the smaller the ownership group. Since there was no market in land in the Imenane valley, Mendes bases his estimate of relative land values on a combination of factors such as soil quality, slope, aspect and altitude. The importance of aspect and altitude arises from the seasonal nature of feed shortages in the Imenane production system. In this system, forage is scarcest in the winter, relatively scarce in the harvest season and abundant in spring and summer. South facing, low-altitude pastures which remain free of snow produce forage in a season of feed scarcity, and are more valuable than north-facing, high altitude pastures which are snow bound and only usable in seasons of forage abundance.

Privately controlled forage land is situated on irrigable valley bottoms which are inherently productive because of their level alluvial soil and also produce feed during the winter when forage is scarce and valuable. These hay meadows are fenced, reseeded, grazed and cut for hay on an individual basis.

Forage land of intermediate value consists of pastures which exhibit a combination of positive and negative attributes. Either they are inherently productive (on good, irrigable soil) but produce forage in the harvest season, or relatively unproductive (on sites unsuitable for irrigation and with poor soil) but produce forage in the winter season. These pastures provide valuable grazing but are not cut for hay. Such land is owned and used in common, either by the members of a single village or a combination of several villages (Village or Multi-

Table 1.4. Forage-land tenure in the Western High Atlas Mountains, Morocco

<i>Land tenure institutions</i>	<i>Orders of size</i>	<i>Pasture type</i>	<i>Season of use</i>	<i>Soil and slope</i>
Private	m ² x 100	irrigated and periodically reseeded hay meadows	winter hay	level alluvial soil
Village commons	hectares	irrigated pasture	harvest season	good soil on slope
Multi-village commons	hectares	irrigated pasture	harvest season	good soil on slope
Multi-village commons	km ²	nearby mountain pastures	winter forage	poor soil, southern aspect
Tribal commons	km ²	high altitude mountain pastures	spring and summer	good soil, northern aspect
Tribal open range	km ² x 10	high altitude pastures, other mountain ranges	spring and summer	poor soil, northern aspect

Source: Mendes 1988

village commons in Table I.4).

The least valuable types of forage land are high altitude mountain pastures which are accessible to grazing only in the spring and summer when feed abundant. These grazing areas are held in common by the members of the tribe. Access is controlled and the season of use is restricted on nearby mountain pastures on good soil (Tribal commons in Table I.4). Rights of access are defined in theory but not enforced on distant mountain pastures on poor soil (Tribal open range in Table I.4).

In sum, the Imenane tenure system recognizes both private and open access to forage land. Between these two extremes there are a number of intermediate gradations, essentially a hierarchy of grazing commonages identified with a hierarchy of ownership groups of increasing size - the village, groups of villages, and the tribe. Larger groups control forage land which is less valuable, either because it is unproductive or productive during periods of feed abundance.

The cost of controlling property and policing its use is a further consideration which reinforces this pattern of land ownership. In the Imenane Valley, the ease with which different land types can be defended is generally a function of their proximity to the village and the compactness of the land area in question (additional ethnographic details are given in Mendes 1988, 1991). Since, in this case, valuable types of land tend to be both limited in extent and near at hand, they are generally both easier to control and more valuable if they can be controlled. Mendes sums up the situation in the following terms:

In the upper Imenane, more specific tenure is associated with higher productive potential of the land, with higher marginal value of forage and with lower costs of protecting ownership (1988: 12).

Mixed Tenure Systems

Questions about the commercialization of property relationships are part of a wider debate about the virtues of communal versus individual forms of agricultural tenure (Cohen 1980). If it has achieved nothing else, the preceding case material equips us to take a sceptical stance towards this debate, which misleads and obfuscates more than it clarifies our understanding of pastoral tenure.

The initial problem comes when we try to characterize pastoral and agro-pastoral tenure systems in terms of the accepted 'ideal types' of tenure. Pastoralists may collectively defend their territorial sovereignty, but the distribution of proprietary rights within a political community typically combines elements of open access, private and communal ownership.

The preceding case material suggests that the emergence of these different levels of exclusivity is broadly predictable. Private property arises when the costs of defining and maintaining individual rights are minimal compared to the benefits of private control. This typically occurs when the resources in question are either small (cisterns in northern Cyrenaica) or easily divisible (irrigated meadows in the Imenane Valley), reliably productive

and/or rendered productive by individual effort or expense (water tanks in the interior plains of northern Somalia).

Alternatively, communal tenure emerges in those situations in which 'individual benefits from joint action are high', that is, where there is clear 'collective benefit' (Wade 1987: 228). Hence the communal control of resources which would be difficult for an individual to exploit or control, for technical reasons (water points in Borana or Karimojong) or for strategic political reasons (large water points in desert Cyrenaica, near-by mountain pastures in the Imenane Valley).

Wide expanses of erratically productive pasture tend to fit neither of these conditions; communal management of these resources is minimal and tends towards open access, is bounded by the territorial limits of the political group, or control is achieved indirectly by limiting access to those categories of property which are susceptible to more restrictive forms of ownership, such as water points, field sites, or especially critical forage resources.

Multiple commonages

In pastoral tenure systems individuals do not hold property rights solely as individuals, but as members and representatives of social groups. Individual rights embody group rights, and the shifting entitlements of individuals entail a redefinition of the rights of the collectivity to which they belong and of the physical boundaries of the property claimed by that collectivity.

Pastoral tenure systems also assign rights to a wide variety of different types of resources - pastures, cultivated, fields, water points, trees, migratory routes, etc - all of which pose different problems and possibilities for exploitation, and may be controlled more or less exclusively depending on the balance of costs and benefits arising from such control. As illustrated by the figures and tables accompanying Part I of this report, the resulting patterns of resource distribution resemble a matrix in which rights to different resource categories are partitioned within a hierarchy of different ownership groups ranging in size from the individual producer up to the largest tribal or ethnic group.

As a result, in African pastoral tenure systems the natural landscape frequently is not carved up into neat territorial packages owned by distinct groups or individuals. Instead, any area is likely to be used by a myriad of different ownership groups of variable size and composition with overlapping claims to territory derived from particular claims to different categories of resources within it. There is not one commonage, but many overlapping ones.

The complexities of multiple boundary claims are compounded by the political nature of the boundaries; they are not objective descriptions of resource use and settlement patterns but self-interested - and potentially contradictory - claims to resources by different parties, claims which may lie dormant for years only to surface when conditions are difficult and compromise unlikely.

Competition between multiple, overlapping ownership groups cannot be easily accommodated within current theories of common property resource management. Both theoretical (Runge

1986) and empirical studies (Ostrom 1990) indicate that the unambiguous identification of a delimited group with a bounded resource is a critical ingredient in the success of collective resource management. Indicative of this concern are the conditions which Runge imposes upon a hypothetical communal grazing situation:

Now imagine a village of n individuals who must graze cattle on a common range of fixed size. Each individual must choose to do one of two things. One is "stinting," or cooperative grazing on the commons. The second is grazing at a level that, while advantageous to the individual, ultimately results in exploitative overuse of the commons (1986: 37).

What is posited here is a version of communal tenure that amounts to little more than a group of pastoralists taking over a pre-existing ranch, and running it with greater or lesser success. The ethnographic record suggests that the real situation may be too complex - and genuinely foreign to our notions of group, property and ownership - to be usefully encompassed within this imaginary squatter-run ranch.

The limitations of Runge's work are not, however, idiosyncratic; they are logically entailed by the prevailing definition of common property. As Ostrom has noted,

Since the work of Ciriacy-Wantrup and Bishop (1975), the presence of boundaries concerning who is allowed to appropriate from the CPR [common property resource] has been used as the single defining characteristic of "common-property" institutions as contrasted with "open-access" institutions (Ostrom 1990: 91).

In her analysis of 'long-enduring CPRs' Ostrom further claims to have demonstrated the empirical importance of boundaries as a necessary but not sufficient cause for the success of collective institutions for resource ownership and management:

Defining the boundaries of the CPR and specifying those authorized to use it can be thought of as a first step in organizing for collective action. So long as the boundaries of the resource and/or the specification of individuals who can use the resource remain uncertain, no one knows what is being managed or for whom. Without defining the boundaries of the CPR and closing it to "outsiders" local appropriators face the risk that any benefits they produce by their efforts will be reaped by others who have not contributed to those efforts (1990: 91).

What is required for effective management, this work suggests, is not necessarily private tenure or an individual manager, but rather exclusive tenure (even if rights are exclusively owned by a group) and a single decision-making body (which may be corporate).

These conditions for successful group management cannot be met on any widespread basis in dry Africa. Indeterminate group and territorial boundaries are not an inadvertent feature of pastoral tenure, or simply a residue of a time when population densities were low and the precise definition of property and property holding groups was unnecessary. For African pastoralists, land management is a political undertaking and land rights are one of the benefits of successful political action. The multiplicity and permeability of territorial boundaries and ownership groups reflects the political foundation of these land-holding systems.

Project experience

With respect to the bounded nature of land holdings and land-holding groups, theoretical limitations foreshadow practical problems in the design of range management projects. For reasons that had little to do with CPR management theory, the setting of rigid ranch boundaries and the unequivocal identification of ranch members were both a persistent concern for designers and a persistent problem for implementers of the older generation of group ranches (Perrier 1983, 1990; Devitt 1982). These projects were attempting to recreate in an African setting the secure but restricted land base available to industrial ranchers, thereby compelling African herd owners to restrict herd growth and intensify rather than expand their operations.

The effect of these projects was perverse; in seeking to identify individuals or groups with clearly delimited territories, the projects multiplied rather than reduced tenurial insecurity and intensified political competition over land. This occurred because the projects attempted (knowing or unknowingly) to eliminate the residual or secondary access rights of peripheral users. Those groups which stood to profit by this process tended to support project activities; opposition came from those who lost.

Evidence from Kenya on the process is summarized by Sandford in the following terms:

Obviously, one group may give unanimous approval to a proposal from which it will gain at the expense of another group. In Kenya, for example, the Maasai responded enthusiastically to a policy of allocating land to group ranches because this seemed to secure the claims of Maasai pastoralists to land in danger of encroachment by neighbouring cultivating tribes In northern Kenya Borana pastoralists support the concept of grazing blocks to the extent (and only to this extent) that they provide a device for keeping Somali pastoralists out of certain areas, and the Somali pastoralists dislike the proposals for the same reason(Sandford 1983: 93).

A similar pattern of opposition and support characterized the response of various pastoral communities to the establishment of grazing associations in the highlands of eastern Lesotho:

High levels of local support have been achieved because the Government of Lesotho's program of assistance has brought tangible benefits to stockholders. Local grazing patterns were adjusted to give Sehlabathebe (an area comprising 10 villages sharing a single watershed) exclusive year-round grazing rights to an extensive nearby high mountain...area. While this step provided the Sehlabathebe grazing association with exclusive control over a region within which a year-round grazing regime could be planned and administered, it also extinguished historical use rights to high mountain pastures held by stockholders in neighbouring communities. This, of course, pleased Sehlabathebe residents. Grazing pressure was significantly reduced at no cost to themselves. Outsiders, of course, were left with reduced grazing and have continued to press demands for some form of relief (Lawry 1987: 2).

The response of various pastoral groups the creation of a grazing reserve in Northern Nigeria followed a similar pattern:

Use patterns on the reserve are very complex. Beside the resident livestock producers, who have farms in the area and graze livestock in the reserve each rainy season, there are numerous other livestock producers coming from many different areas who do not have farms in the area and who graze livestock in the reserve on an irregular basis depending on forage and water availability elsewhere. The livestock producers recognized the downward trend in range condition on the reserve and several of them attributed this to overgrazing. However, the resident livestock producers felt unable to force the irregular users to graze their livestock elsewhere. The proposal to give use rights to groups of resident livestock producers and the problems involved with this were discussed. The resident livestock producers were in favour of limiting the use of the reserve to their livestock but felt that they would need a lot of help to organize and enforce this (Perrier and Craig 1983: 10).

Generalizing about grazing and settlement schemes in subhumid tropical West Africa as a whole, Oxby reached the following conclusion:

The main attraction of settlement projects for herders appears to be the promise of secure land rights, rather than any economic benefit from improved animal husbandry (Oxby 1985: 230).

Finally, the attempt to create communal grazing cells in Botswana elicited the following observations from the officer in charge of the project:

Communities were often motivated by the possibility of securing additional grazing or an additional source of water rather than by a realisation of the need to improve the management of their existing resources (Sweet 1987: 14).

On the other hand,

Protests against the Ntimbale Grazing Cell were registered by an amorphous groups called 'Mambo and Maingwaneng Workers'. They claimed the cell occupied their grazing land and that they had not been duly consulted about the project (Sweet 1987: 10).

In some communities there has been reluctance to allow one group exclusive use of part of the commonage and to fence it off (Sweet 1987: 17).

In the project areas referred to the preceding quotations, different groups did not possess territorially distinct communal areas. Communal property was not used simply by a collectivity of individuals within a single group, but by a multitude of such groups. The formal schemes could not grant exclusive title to clearly defined groups without eliminating these multiple layers of use and ownership. Pastoralists supported these simplifications when they enhanced their control over resources against the claims of other customary users. Such activity was perfectly consistent with established pastoral procedures for settling land issues through competition in terms of power. All that was unfamiliar was the arena in which competition now took place. Instead of overt military competition, success now rested on the capacity of different interest groups to influence project decisions and the deployment of project resources:

It is envisaged that, at least initially, a small number of livestock producers can be elected by each group to form a management committee that can act as a decision making body for the whole group. The members of each group will each be issued a plastic credit card that proves their use rights on their group's part of the reserve and eventually will allow them access to [the project's] livestock service centre and small farmer credit. Mounted range guards have already been hired...and are to help the livestock producers enforce their use rights (Perrier and Craig 1983: 11, referring to the Northern Nigerian grazing scheme described by the same authors in an earlier quote.)

PART II

RANGE ENCLOSURE

The exclusive ownership of natural rangeland is uncommon in dry Africa, not because pastoral tenure systems do not recognize individual entitlement, but because the erratic and low productivity of this resource generally renders such control unattractive (Part I). The value of a resource is not, however solely determined by its natural attributes, but by the production system which renders these attributes useful. Property rights analysis predicts that more exclusive forms of control will emerge whenever technical, legal, economic or demographic changes diminish the costs of exclusive control or increase the benefits derived from limited access.

An analysis not reported here (Behnke 1994) has examined pastoral competition over resources in stable institutional settings in which the rules of customary tenure remained unaltered, although there could be considerable changes in the personnel who occupied the positions of entitlement within a stable system. The case material presented here focuses on a different process of adjustment - the manipulation by pastoralists of their tenure systems to produce not changes in personnel but in the rules governing property control.

This second part of the report examines four spontaneous range enclosure movements. In the cases examined here pressures for enclosure were generated by technical innovations, drought, inter-ethnic hostility and/or increases in the aggregate number or concentration of livestock. These changes resulted in localized increases in grazing pressure beyond levels deemed acceptable by certain pastoralists - overgrazing, as defined by local standards. These cases illustrate the way in which demand on resources is regulated within pastoral societies by means other than outright military confrontation and coercion. The means to this regulation are changes in the partitioning of resource use within the customary tenure system, a process of legal and economic 'internalization.'

Internalization

Overgrazing on communal land is a particular instance of the more general economic problem of externalities. Externalities are the consequences of their activities which actors need not take into consideration, for one reason or another. A commonly-cited example of an economic externality is environmental pollution caused by a manufacturing process. Such pollution is an externality if manufacturers are not held accountable for it and need not consider it as one of their costs of production, in much the same way that private herd owners may choose to ignore the contribution which their stock make to the degradation of the communal range.

Externalities are internalized when actors are forced to take responsibility for what had

previously been the side-effects of their behaviour. In the example of environmental pollution, internalization would involve holding manufacturers accountable for their pollution, through the payment of compensation to those who were adversely affected, for instance, or through the required purchase of equipment to prevent pollution in the first place. In the overgrazing example, internalization might involve a change from communal to private land tenure, a change which would force individual herd owners to bear all the consequences of their own overstocking (Hardin 1968). In either case, the manufacturer or herder would have to take the costs of pollution or overgrazing into account in computing the costs of producing his product, and both would be likely to change the way they did business.

'Externality' and the 'internalization of externalities' are labels for reasonably commonplace notions. What is not immediately evident is the relationship between these notions and the structure of property systems. A clue to this relationship is provided by the fact that legal changes are often involved in any move to shift the accountability of actors for their actions. A few examples drawn from the work of Ronald Coase will give some substance to the notion of externality and establish the relationship between externality, property and the law.

In his work on social cost Coase was 'concerned with those actions of business firms which have a harmful effect on others,' i.e., with negative externalities (1960: 1). Over and again Coase cites examples in which a firm or individual was potentially liable for damages to another party. There was the case of a candy maker who used heavy machinery which made it difficult for a neighbouring doctor to use his consulting room. There was the case of a brewery which created a stink for its neighbours. Finally, there was a case from Florida concerning 'a building which cast a shadow on the cabana, swimming pool and sunbathing areas of a neighbouring hotel' (429). In all these instances, vibrations, stink or shadows were externalities. Each of these examples was, moreover, based on an actual court case in which judge or jury were being asked to set the legitimate limits of individuals or firms to use their own property at the inconvenience of others and without compensating them. The legal authorities were being asked, in other words, to decide whether or not a particular property owner would be forced to internalize an externality, that is, to be responsible for his vibrations, bad odours, or shadows.

The court cases cited by Coase applied accepted legal principals in ambiguous circumstances, but they did not challenge the prevailing system of individual property. The effects of internalization are not, however, always this modest, especially when legal change has been precipitated by fundamental technical or economic change. These major shifts in property systems have been characterized by Demsetz in the following terms:

Property rights develop to internalize externalities when the gains of internalization becomes larger than the cost of internalization. Increased internalization, in the main, results from changes in economic values, changes which stem from the development of new technology and the opening of new markets, changes to which old property rights are poorly attuned (1967: 350).

Demsetz uses several concrete examples to give substance to this abstract framework. The best developed of these examples pertains to the classic works by Speck and Leacock on the fur trade and Indian hunting territories in the Labrador Peninsula (Leacock 1954; Speck

1915). In contrast to Coase's court cases, this historical case involves a major shift from communal to private hunting territories in response to the development of the commercial fur trade. In Demsetz's terms, this shift hinges on an externality - the over-hunting of game under a system of communal land ownership:

Because of the lack of control over hunting by others, it is in no person's interest to invest in increasing or maintaining the stock of game. Overly intensive hunting takes place. Thus a successful hunt is viewed as imposing external costs on subsequent hunters - costs that are not taken into account fully in the determination of the extent of hunting and of animal husbandry (1967: 351).

Up to this point Demsetz's argument parallels Hardin's account of the causes of overgrazing on common rangeland, but Demsetz recognizes a series of economic and legal responses to this dilemma which Hardin never envisaged. Prior to the fur trade, Demsetz reasons, the possibility of overhunting existed, but the problem was not significant and it was not in the interests of the Indians to correct the situation. This was the case because fur-bearing animals had a relatively low commercial value prior to the fur trade. There was, therefore, both a minimal incentive to overhunt them and a minimal incentive to control any overhunting as might exist. Communal hunting territories were an 'economic' legal response to this situation. As the price of fur animals went up, however, both the costs of overhunting and the incentives for overhunting were increased as were the financial rewards to successful animal husbandry. The incentives now existed for the Indians to evolve a form of property that would allow them to handle (or internalize) the overhunting problem. Following Leacock, Demsetz shows that the development of private hunting territories - which discouraged collective overhunting and encouraged individual long-term conservation of the animal population - coincided geographically and temporally with the spread of the commercial fur trade.

Implied in Demsetz's analysis is a pattern of local response to resource depletion which is at variance with Hardin's theory of the tragedy of the commons. Instead of an inevitable process of resource depletion, property rights analysis suggests the possibility of spontaneous legal and tenurial change undertaken by resources users.

An African case which conforms to this pattern has been described by Bauer in his analyses of periodic shifts between communal and individual land tenure in the villages of Tigray, Ethiopia (1987). In these villages, cultivated land was individually owned, but the erratic distribution of rainfall and the prohibitive costs of maintaining boundaries between separate paddocks meant that the villagers had to manage their grazing land in common. Grazing pressure on this common land was, according to Bauer, controlled indirectly by changing the terms under which arable land was held.

Villages could choose between two distinct, named tenure systems - an open tenure system in which individuals could claim field sites by demonstrating the wherewithal to plough them, versus a relatively closed system in which arable land was claimed through inheritance or descent, often after an intense legal and political struggle. The open system of tenure facilitated the incorporation of immigrants into a village; the restrict alternative tended to slow immigration, thereby limiting grazing pressure on the village commonage by stopping the conversion of communal pasture into private arable land by immigrant farmers, and by

controlling the total number of cattle owners/farmers. Instead of attempting to regulate communal resource exploitation, the villagers internalized the problem by changing their tenure system:

The tragedy referred to by Hardin (1968) - that each person will add more cattle to the commons - was regulated instead by changing the definition of who has rights to the commons under varying population conditions (Bauer 1987: 22).

Population pressure: Sukumaland, Tanzania (late 1930s)

The case studies in Part I documented a relatively straight-forward correlation between the inherent productivity of a natural resource and the tenure arrangements which pertain to it. In Sukumaland the relationship between resource productivity and property rights was more complex and only emerged over time. Based on topography and soil, the Sukuma have long recognized a wide variety of different field types and grazing areas. Only under conditions of land pressure and resource scarcity, however, were these ecological variations reflected in their tenure arrangements.

During the Colonial period, land rights among the Sukuma were administered through a hierarchy of chiefs, village headmen and the leaders of village communal work parties. While the chiefs were the titular owners of their areas (Malcolm 1953: 25), their authority was limited to the right to regulate the disposal of the resources under their care, and did not imply personal possession. In recognition of their status and to defray the costs of their official duties, chiefs received an annual tribute paid in grain by the households under their jurisdiction. The amount of these dues was small and 'could not be looked upon as in any sense comparable to rent payable for use of the chief's land' (Malcolm 1953: 27).

Under the delegated authority of the chiefs, village headmen were responsible for the allocation of virgin land or the reallocation of abandoned property within their village. From the point of view of the individual proprietor, this system provided considerable security of tenure. Land could be inherited, but absentee ownership was difficult to maintain since resources which were not being used could be reallocated by the headman to a new occupant. Malcolm summarized the Sukuma land tenure system in the following terms:

In essence it consists of individual land right limited to the period of effective occupation, restricted as regards rights of transfer, controlled in relation to succession, and collectively forming the village unit of occupancy. Subject to the overriding needs of the community, it does not involve insecurity for the cultivator. It therefore presents no difficulties in the way of concentrating, though not of accumulating holdings (Malcolm 1953: 114).

Precisely how the customary system worked depended largely on the extent of land pressure in a particular locality. In the 1890s a series of ecological disasters - Rinderpest, smallpox, locust plagues and famine - dramatically reduced the human and livestock population and shrank the area of inhabited Sukumaland to around a quarter of its previous size (Birley 1982: 2-3). The land allocation procedures which prevailed during the 1930s therefore reflected a situation in which land was scarce in some parts of Sukumaland, but was freely available

elsewhere.

Confronted with insufficient livestock forage, the unavailability of arable land or land exhausted by a history of heavy use, individuals emigrated from areas of high land pressure and pioneered settlement in new areas. The pace of colonization was moderated by the dangers to man and beast of tsetse in uncleared bush, and individuals moved only when these dangers were judged to be less than the problems of land availability, land exhaustion and heavy stocking in their areas of origin. By destroying the woodland - either intentionally or as a by-product of their agricultural and pastoral activities - settlers eliminated tsetse fly habitat and gradually reduced the tsetse challenge. Thus, on the fringes of habitation, humans and their livestock not only used but also created a productive landscape.

The Sukuma land tenure system therefore encompassed two very different land use situations. In areas of long-established settlement and high land pressure, natural resources were scarce. In peripheral areas of low land pressure, natural resources were potentially abundant but had to be transformed into productive resources by the effective deployment of human labour. The internal organization of Sukuma land tenure reflects this gradient of population pressure and land scarcity:

'We are apt to forget that land, even potentially fertile agricultural land, has no absolute value, but only that by which it is endowed by man acting as the agent of a given economic system.... Anyone can fish in the sea and it is not until there is competition in a limited area that rights acquire definition. Anyone can use the land and it is not until habitable land becomes limited or a permanent crop appears, that rights acquire a value and gain definition even in the minds of those who exercise them (Malcolm 1953: 81).

In areas being reclaimed from bush, labour was scarce and additional settlement in the form of new villages or farms was a positive benefit to prior inhabitants. In these areas, natural resources, irrespective of their potential value, were open on a first-come basis. Existing villages or village authorities took care to allocate to new settlers either village areas or farms which incorporated the full range of resources needed for successful farming and livestock husbandry (Malcolm 1953). Aside from the principle of first occupancy, the basis for land allocation was a recognition of the primacy of labour in establishing use rights: 'To generalize it might be said that labour is the origin of ownership, and expenditure of physical energy gives the right to revenue accruing as a direct result' (Malcolm 1953: 53). Only under conditions of land scarcity did more restrictive rules come into play.

Following Sukuma practice, Malcolm recognizes several distinct categories of property subject to different allocation rules - house sites, bush products (honey, thatching grass, building poles, etc), arable field sites and crops, water points and grazing resources. With each of these forms of property, more restrictive conventions regarding control and transfer came into operation as the resource attained a scarcity value. Freely available on the margins of settlement, bush products were routinely appropriated by individuals in the densely populated villages of central Sukumaland (Malcolm: 53-55). Similarly, house sites were freely allocated in low density areas, but were subject to 'illicit sales' around the new administrative centres (Malcolm 1953: 117). The greatest variation in ownership practices occurred, however, with respect to those resources which were most critical in the Sukuma agricultural system: arable

field sites and grazing areas.

With respect to cultivated fields, outright sale was prohibited but Malcolm noted that 'the sale of crops sometimes simulates land sales' (1953: 51). In the 1930s, however, there was little pressure to institute a system of land sales since there was plentiful virgin land for reclamation. The situation had been different in the pre-Colonial period when tribal warfare had forced the population to live in fortified settlements and 'land sales between individuals...evolved in some places during the period of extreme congestion' (Malcolm 1953: 12). These sales pertained, however, only to the most productive category of valley-bottom land:

Sales of land existed in the more congested areas of central Sukumaland. The land sold at that time was *mbuga* soil only, as this rich dark valley land, when within range of water and therefore capable of exploitation, produces the heaviest sorghum crops. These transfers of land for a consideration, which usually consisted of one or two cattle, were only sales of the right of use. While it is understood that the German Administration put a stop to these land sales, it is also clear they became unnecessary, as owing to the cessation of tribal warfare the population was able to spread and obtain new *mbuga* lands without payment (Malcolm 1953: 47).

The reservation of grazing land by either individuals or an entire village was, like the sale of arable land, directly correlated to resource scarcity (Smith 1938; Malcolm 1953). Malcolm describes the process as follows:

When a village has been occupied for many years, the people will recognize that there is too little grass in the dry season to meet the requirements of an increased stock population within range of water. Each cattle-owner will then begin to reserve grass-land in the follow of the arable area allotted to him, partly to supply thatching grass but mainly for reserve cattle fodder (1953: 73).

There comes a time in the stocking of the village when all the grass which has not been eaten is trampled down, and that which is not removed by the wind is washed away by the first rains. It is at this stage, when cattle lose condition and the older beasts die (partly of starvation and partly of the effects of eating sand while attempting to feed on broken-down grass) that the *ngitiri* grazing reserve becomes a necessity (1953: 75).

In areas of intense fodder scarcity, even farmers who did not own cattle maintained reservations, either for small stock or, where permitted, to rent to groups of cattle owners.

The geographical distribution of grazing reserves confirms Malcolm's generalization that they were a response to forage scarcity. With the exception of areas of high rainfall and plentiful forage around the shores of Lake Victoria, the reservation system was oldest in the central, settled areas of Sukumaland (Kwimba District), and had spread in the mid-1920s to new areas of heavy cattle concentration but lower rainfall (eastern Shinyanga District and parts of Maswa District (1953: 73, 74). By the late 1930s, reservation had not begun in areas where pasture was plentiful relative to stocking pressure (Mwanza, western Shinyanga and Zinza), and efforts by the administration to institute the system in such areas (Shimiyu and Huruhuru

grasslands) were resisted by herd owners (1953: 78).

Drought³: range enclosure in South Darfur, Sudan (1984)

The principles which organize the customary land tenure system in South Darfur conform to what we would expect on the basis of property rights theory and the previous discussion of the organization of pastoral tenure systems. On a pattern reminiscent of Cyrenaica, the claims that individuals have to the exclusive control of cultivable fields becomes more attenuated as the productivity and value of the fields declines. At the far end of the continuum, natural rangeland is open to all (Behnke 1985).

More important for an understanding of range enclosure is the allocation of rights to graze animals on the agricultural residues left behind in harvested fields. In South Darfur, thorn-bush fences are routinely constructed to prevent livestock from trespassing on fields containing crops, but customary practice held that harvested fields were open to common use by all livestock owners. In communities where grazing pressure remains low, field owners may fence fields only on their exposed sides and, even if completely enclosed, a perimeter fence does not alter the conditions under which crop residues are used. Anyone can hand-cut grass on an enclosed field, and any herd of cattle may graze the field after the harvest.

However, in areas where it is clear to livestock owners that there are more cattle than the natural range can conveniently carry, local variations in customary usage permit farmers to restrict access to their fields after harvest. The degree of restriction tends to correspond to the perceived degree of grazing pressure. In areas of moderate grazing pressure, entry may be restricted to friends, neighbours and kin, on a reciprocal basis and contingent upon the field owners permission. In localities where fodder is scarce, owners may have the right to restrict use to their own animals or to charge others for the privilege. The overall pattern of land holding in South Darfur is, therefore, remarkably similar to that described for Sukumaland: increasing resource scarcity is correlated with increased precision in the definition of property rights and more restricted access.

In South Darfur, legal ambiguities arise because, in practice, the distinction between an arable and a grazing enclosure is often unclear, although the former is legal and the latter is not, both in terms of customary usage and Sudanese national law. It is acceptable under customary usage for farmers to enclose a certain amount of uncultivated land around the margins of their fields, thereby providing room for the later expansion of the cultivated area. Farmers may not cultivate all of an enclosure in any cropping season, but the nature of thorn fencing - which is expensive and laborious to construct and deteriorates rapidly - discourages them from enclosing vast unproductive areas, if the real intention is to eventually cultivate the whole area.

Widespread enclosure becomes an attractive proposition, however, once owners establish control over their fields after the harvest, and thereby have a quasi-legal claim to any fenced area which also contains a patch of cultivation. When natural grazing becomes a scarce and

³This section is based on Behnke 1985a and 1985b.

valuable commodity in an area, the interests of these field owners may shift from using fencing to protect crops to using cropping as an excuse to control rangeland, for their own livestock or to sell pasture rights. The result in some areas of South Darfur was a two-tiered pattern of field enclosure in which large fields (of 10 ha or more) tended to be cultivated over not more than 10% of their area, and served primarily as grazing enclosures, while small fields (of 1-3 ha) were more intensively cultivated and constituted genuine arable field sites.

These range enclosures, locally termed *zariiba saki* or *zariiba al-hawa* ('empty' or 'air' enclosures) were of dubious legality. In public, all agreed that such enclosures were illegal, and those who constructed them were likely to deny that they did so, while admitting that such enclosures were common enough in surrounding communities. Accordingly, neither the traditional tribal authorities nor district-level administrators officially sanctioned range enclosures. The de facto legal of range enclosure was more evident, however, if one examined the rulings of local courts in areas where enclosures were common. These courts were dominated by and represented the interests of the local resident population which had erected the enclosures, and the courts routinely enforced fines against livestock owners whose stock grazed either crops or enclosed rangeland.

Enclosure was thereby precipitated by an increase in grazing pressure in certain localities, and sanctioned by subtle changes in/manipulation of customary law and local administrative procedures. These changes were not occurring uniformly over the entire province, but were restricted to one local district council located to the south and west of the provincial capital of Nyala. To understand why enclosure was taking place only in this area we must have some understanding of the locality's importance within the larger regional system of herd movement and range use.

The attempts at range enclosure described here were undertaken by relatively settled agro-pastoral communities. These communities were engaged in rainfed, flood-recession and irrigated farming, combined with animal husbandry. Not all settled agro-pastoralists were interested in enclosure. Enclosure occurred only in those areas which contained an unusually plentiful supply of dry-season water from hand-dug wells in dry river beds. These areas, and only these areas, could sustain relatively large populations of non-migratory cattle. Since long-distance migration was incompatible with the practice of intensive agriculture, it was only in these localities that the resident farming population could accumulate significant herd wealth.

In addition to the resident population, the area of spontaneous range enclosure was also used on a seasonal basis by long-distance migratory pastoralists. These transients practised some agriculture, but were essentially specialized livestock producers who tailored their movements to the requirements of their herds, owned larger herds and managed them more efficiently and intensively than the settled population.

During the dry season, the migratory herds were located far to the west or south of the settled communities in areas of high rainfall where surface water for stock was plentiful and where there was an abundance of dry season forage. These dry-season grazing areas were, however, rendered untenable in the wet season by flooding, heavy clay soils which were impassable to livestock when wet, and the seasonal recurrence of trypanosomiasis and outbreaks of biting

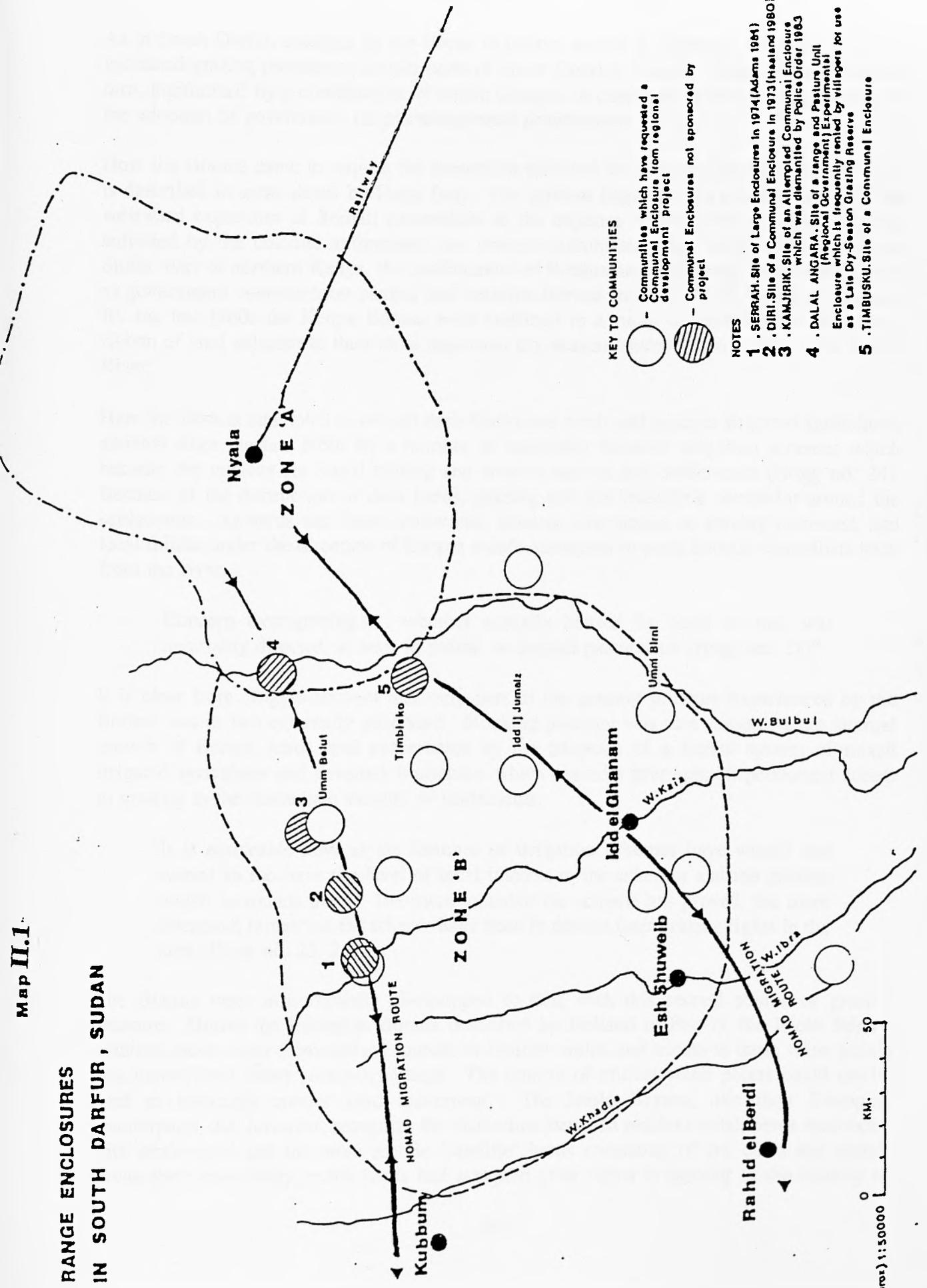
flies. The Nyala area provided an attractive wet season grazing ground for the migratory herds, for several reasons. Because of its relatively high, well-drained and firm ground, it provided a refuge during the rainy season from mud, biting flies and disease; it also offered the highest quality pasture available to livestock in the region in the wet season (HTS 1974). Finally, it afforded an opportunity to sell livestock at a time when they were in good condition or exchange livestock produce when it was seasonally plentiful, by selling live animals to traders operating out of Nyala town or by bartering milk or grain with the settled farming population.

The migratory pastoralists had, therefore, every reason to defend their access to these critical wet-season grazing grounds. Resident agro-pastoralists had little motive to challenge these rights as long as forage was abundant enough to sustain the local cattle population, which was limited by local supplies of dry-season water. By the late 1970s both outside scientific observers and the local population had concluded that such forage was no longer abundant and that the area was severely overgrazed (Adams 1979, 1982), and there are scattered reports of range enclosure at that time (Haaland 1980). These chronic forage shortages were, finally, exacerbated by a severe drought in 1983-85 which suddenly reduced the forage supply and precipitated a crisis.

Spontaneous range enclosure was, therefore, based on competition between transient and permanently resident livestock-keepers for control of a diminishing range resource. It provided a mechanism whereby local cattle keepers could restrict wet-season grazing by nomadic cattle of fodder that local cattle would later need to survive the dry season. The restricted geographical distribution of the enclosure movement reflected the extraordinary importance of certain favoured (and, therefore, intensively used) localities in the regional system of livestock movement. In adjacent areas unaffected by enclosure, either pasture was plentiful and not worth the trouble of enclosing, or there was insufficient dry season water to sustain large numbers of local stock and thereby precipitate a conflict of interest between local and transient users.

Whether local communities were interested in government or donor-sponsored programmes of range management was contingent upon the prior existence of these conflicts of interest. Under government sponsorship, villages of settled agro-pastoralists were offered the opportunity to legally erect communal stock enclosures. The purpose of these enclosures was to prevent range degradation by protecting perennial fodder species during periods of vegetative growth and reseedling, i.e., during the wet season. This, of course, was precisely when nomadic stock were in the area. Although they were explicitly designed to promote range conservation, these programmes inadvertently provided settled livestock keepers with a rationale for excluding nomadic users. As of January, 1985, all existing, proposed, or requested project enclosures lay in or immediately adjacent to the area of spontaneous enclosure, and most lay along major nomadic trek routes where grazing pressure was at its highest (Map II.1). Thus the project-sponsored enclosure programme had developed a clientele only in areas where pre-existing economic pressures favoured spontaneous enclosure, and where local residents had their own reasons for adopting this new legal ploy in their struggle to control scarce grazing resources.

RANGE ENCLOSURES
IN SOUTH DARFUR, SUDAN

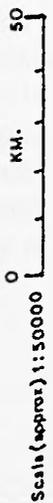


KEY TO COMMUNITIES

- - Communities which have requested a Communal Enclosure from regional development project
- ◐ - Communal Enclosures not sponsored by project

NOTES

- 1 . SERRAH. Site of Large Enclosures in 1974 (Adams 1981)
- 2 . DIRI. Site of a Communal Enclosure in 1973 (Heatland 1980)
- 3 . KAMJIRIK. Site of an Attempted Communal Enclosure which was dismantled by Police Order 1963
- 4 . DALAL ANCARA. Site of a range and Pasture Unit (Regional Government) Experimental Enclosure which is frequently rented by villagers for use as a Late Dry-Season Grazing Reserve
- 5 . TIMBUSKU. Site of a Communal Enclosure



Ethnic tension: the Isiolo Boran, Kenya

As in South Darfur, attempts by the Boran to restrict access to rangeland were motivated by increased grazing pressure in certain parts of Isiolo District, Kenya. These changes were, in turn, legitimized by a combination of subtle changes in customary tenure arrangements and the adoption of government range management programmes.

How the Borana came to require the protection afforded by government range programmes is described in some detail by Hogg (nd). The process began over a century ago with the westward expansion of Somali pastoralists at the expense of the Borana. After a pause enforced by the colonial authorities, this process culminated after independence with the Shifta wars of northern Kenya, the confinement of Borana and their stock in what amounted to government concentration camps, and massive Borana stock losses and impoverishment. By the late 1960s the Kenya Borana were confined to a rump of their former territory, a ribbon of land adjacent to their most important dry-season source of stock water, the Ewaso River.

Here the Borana attempted to rebuild their flocks and herds and practice irrigated agriculture, assisted since the late 1960s by a number of externally financed irrigation schemes which became the nucleus for small trading and service canters and settlements (Hogg nd: 24). Because of the destruction of their herds, grazing was not initially a constraint around the settlements. As herds and flocks recovered, concern over access to grazing increased, and local militia under the direction of Borana chiefs attempted to push Somali pastoralists back from the river:

Concern over-grazing whether actually caused by them or not, was invariably directed, at least in public, at Somali pastoralists (Hogg nd: 27).

It is clear from Hogg's account that only part of the grazing pressure experienced by the Borana was in fact externally generated. Stocking pressure was also caused by the internal growth of Borana herds, and exacerbated by the adoption of a settled system of mixed irrigated agriculture and livestock husbandry which placed a premium on permanent access to grazing in the immediate vicinity of settlements.

It is noticeable how as the fortunes of irrigation schemes have waxed and waned so too have the level of local interest in the schemes and the grazing which surrounds them. The more valuable the scheme has proved, the more interested farmers at the scheme have been to defend their grazing rights in the area (Hogg nd: 25, 26).

The Borana were institutionally ill-equipped to deal with this second source of grazing pressure. Unlike the Ethiopian Borana described by Helland in Part I), the Isiolo Borana obtained stock water from surface sources or shallow wells, and access to these water points was unrestricted under customary usage. The control of critical water points could not be used to indirectly control herd movement. The Isiolo Borana, like their Ethiopian counterparts, did, however, recognize the distinction between resident milch herds associated with settlements and the more mobile 'satellite' herds consisting of dry cows and males. Given their immobility, milch herds had accepted prior rights to grazing in the vicinity of

settlements, a reciprocal courtesy which in theory did not infringe upon the rights of all Borana households to pasture their animals anywhere within the tribal domain.

The problem for the Kenyan Borana, was that their way of life had dramatically changed. Bereft of herds large enough to subdivide and, in any case, excluded by the Somali from the wet-season pastures which were the traditional preserve of the satellite herds, Borana who had settled in populous grazing schemes had an intense and permeant interest in excluding all outsiders from nearby riverine grazing, particularly in drought years when forage was scarce.

This exclusion was justified by appealing to the recognized principle that immobile herds had preference over mobile herds; but mobile herds - which had once represented a proportion of the livestock of almost all households - now belonged exclusively to Borana outsiders. As Hogg describes the situation, a tentative move had been made to adjust the customary tenure system to recognize grazing rights based on locality and residence, and to restrict access to outsiders, be they Somali or fellow Borana.

This subtle but fundamental alteration in customary grazing rights was conveniently obscured by focusing attention and hostility outwards upon Somalis, and finally, by appealing to government range management programmes which grant users legal title to a particular area and the right to exclude outsiders.

For the Isiolo Boran, the Somali presence presented an opportunity to institute change which was at the same time both traditional, in that it drew on the traditional distinction between home and camp-based livestock and a long-standing hostility to Somali, and modern, in that the change could be passed off as a move towards modern range management practice (Hogg nd: 28).

Finally, Hogg leaves no doubt as to the extent to which the Borana were themselves likely to comply with those aspects of the grazing programmes which infringed upon or altered their own husbandry practices:

Borana are in favour of grazing blocks only in so far as they could be used to exclude Somali from the district, and revert to the pre-Independence status quo....Even if Somali were excluded, it is highly unlikely that Borana would be content to restrict their movements to within government-imposed grazing blocks or any variant of them. The moves towards enclosure I have described ... in no way indicate any general approval on the part of Boran with official range management ideas about controlled or rotational grazing schemes (Hogg nd: 27, 28).

Technical change: range enclosure in Central Somalia

Range enclosure in central Somalia is a response to increased grazing pressure, and its development closely parallels the evolution of restrictive grazing practices in Darfur and Isiolo. The following, abbreviated account underlines these parallels; a full description of the process has been published elsewhere (Behnke 1988).

As in south Darfur, enclosure in central Somalia is a localized phenomena restricted in its geographical distribution to an area possessing fertile soil suitable for farming, good local

grazing resources, and a favourable location relative to the distribution of livestock disease vectors and alternative grazing areas within the region. The suitability of the area for agro-pastoral production and, consequently, pressure on its grazing resources, was compounded in the late 1960s and early 1970s by the establishment of five boreholes equipped with diesel-powered pumps, a concentration of stock water unequalled in other parts of the central Somali rangelands.

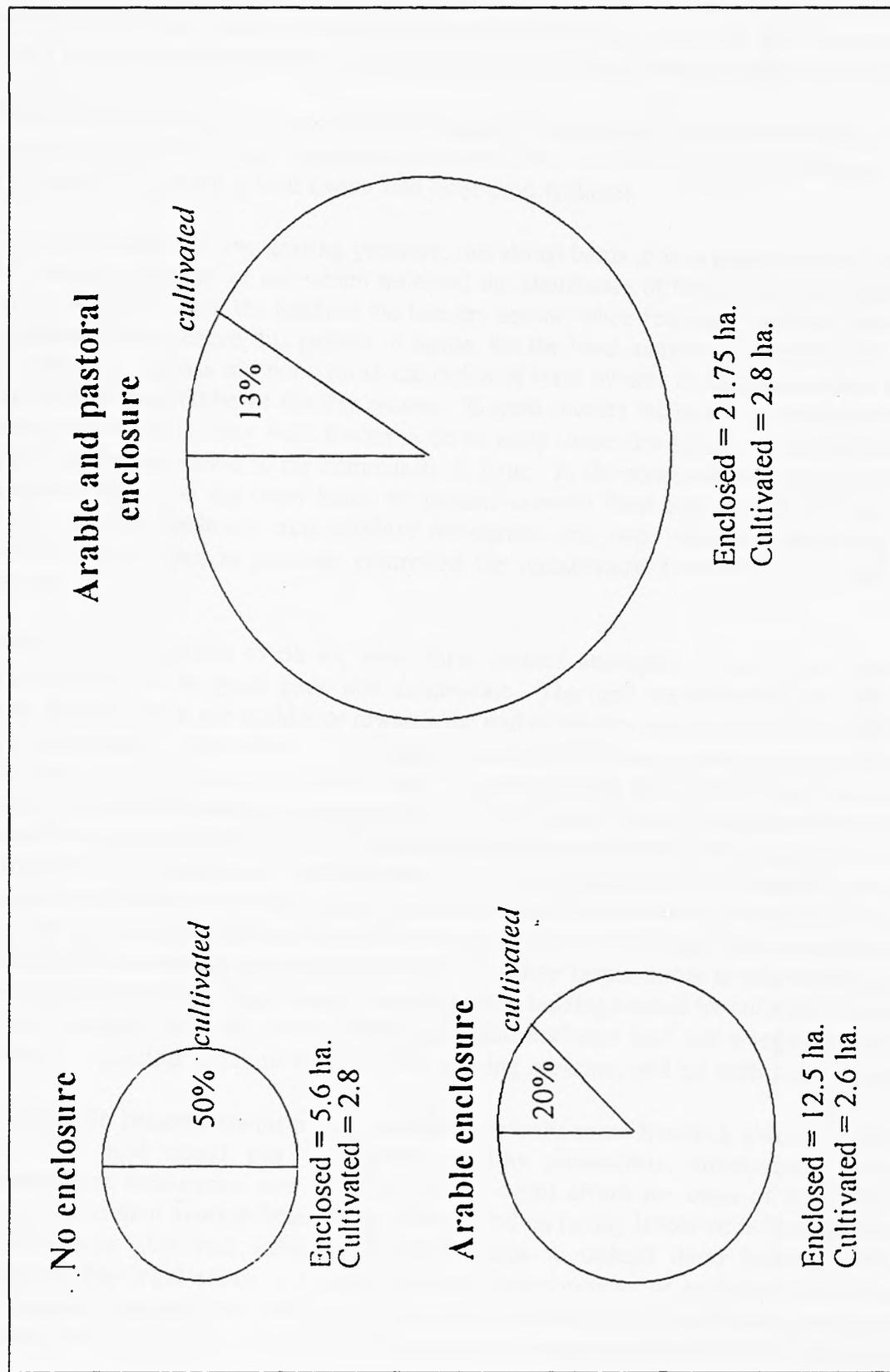
The part played by these pumps in altering the Somali agro-pastoral production system was analogous to that of the irrigation schemes in Isiolo: The pumps made settled agro-pastoralism possible, attracted traders and settlers, and created a land shortage where none had perviously existed. This shortage was most acute in the immediate vicinity of the watering point where competition for both pasture and arable field sites was intense. It declined with increasing distance from water, and was generally less intense around smaller water sources.

In the zones of most intense pressure, pastoralists responded to the diminished availability of forage by erecting thorn-bush grazing exclosures. As in South Darfur, the fencing of arable land was legal and the fencing of grazing land was not, in terms of both customary and national land law. Producers therefore took prudent steps to obscure the distinction between arable and pasture land. Three stages in the enclosure process could, nonetheless, be discerned at different levels of land shortage. The effects of this process on the size and management of farms is displayed in Figure II.1.

Even in situations of low land pressure, represented by the 'No Enclosure' category in Figure II.1, farms were normally perimeter fenced to prevent stock trespass. The total enclosed area was small, around 5 ha, and about half of this total area was cultivated, the other half consisting of old cultivated land currently under fallow or virgin land set aside for future cultivation. The uncultivated area within these farms was used for grazing; typically the farm owner's herd was deposited inside the fence at the end of the rainy season, not because it required special fodder (for at this time the natural rangeland was at its best) but to reduce the labour involved in tending livestock during the busy harvest season. As soon as the crops were off the fields, the animals would move onto them to graze the crop residues. The enclosed fodder on the farms - either crop residues or natural forage - was long depleted by the end of the dry season when natural forage was most scarce and the needs of the livestock were greatest.

Zones of moderate land pressure were characterized by larger farms of about 12 ha in which the cultivated area was, on average, only 20% of the total enclosed area, the 'arable enclosure' category in Figure II.1. These farms constituted, in the main, a response to arable land shortage rather than grazing pressure. The cultivated hectarage on these farms, between 2 and 3 ha, was no greater than under pre-enclosure conditions. What enclosure did in this situation was establish an individual's claim to a land area sufficient to sustain a permanent farming operation, given that individual field sites could be continuously cultivated for 6-8 years, but subsequently required fallowing for 25 to 30 years before re-cultivation. These periods of rest and use imply a five-field rotation system, if a farm is to be geographically stable; with an average of one-fifth of their farms under cultivation at any time, these farms were large enough to achieve this. Despite the cost and impermanence of thorn fencing, farmers were concerned to establish preemptive claims to fallow land in order to insure their permanent residence in a favourable location near water supplies, and to defend themselves

Figure II.1: Enclosure and farm structure in Central Somalia



against the competing land claims of their neighbours.

Zones of intense land pressure, essentially areas immediately adjacent to large water points, were characterized by a combination of arable and pastoral enclosure, Figure II.1. While the cultivated area within these farms was identical to that in zones of low land pressure, the enclosed area was now nearly four times greater than farms in areas of low land pressure, and much in excess of that required to claim sufficient fallow land for further cultivation.

What is of interest to us here are the changes in customary land tenure rules which were required to render pastoral enclosure attractive. As in South Darfur, these changes concerned the degree of control a land owner had over crop residues.

Under conditions of low grazing pressure, individual herds grazed enclosed areas early in the dry season, a pattern of use which reflected the abundance of forage and the capacity of the open range to sustain the herds in the late dry season when feed was scarcest. Local custom validated and enforced this pattern of usage, for the local authorities who mediated in cases of livestock trespass did not uphold the rights of farm owners to exclude animals from their farms after the middle of the dry season. If farm owners wished to make exclusive use of their crop residues, they were forced to do so early in the dry season before harvested fields were legally accessible to the community at large. In the zones of intense land pressure and forage scarcity, on the other hand, by general consent farm owners had full and exclusive rights to their enclosed crop residues throughout the year. But by controlling the crop residues, they also, in practice, controlled the uncultivated but enclosed portions of their farms.

When it was feasible to do so, these farm owners attempted to hold their herds off the enclosure to let the grass grow and accumulate. The herd were then let into the enclosure after the harvest in the middle or towards the end of the dry season when the natural pastures were depleted. The enclosures therefore served as a fall-back grazing reserve to be used in the periods of greatest nutritional stress. The enclosures were particularly valuable in this season because they lay close to water, and weakened animals had a reduced distance to travel between water and pasture. Pastoral enclosures were now effectively, if covertly, legal in terms of the customary tenure system. All that remained was for pastoralists to enclose areas which were sufficiently large to sustain a significant number of animals, and many did so. In areas of pastoral enclosure, farm owners with more grass than their animals could consume frequently rented the grazing rights on their farms, either to other herd owners with insufficient enclosed forage or to livestock traders holding animal for collection and shipment. There was, on the other hand, neither sufficient enclosed area nor a legal foundation for a market in grazing rights in zones of low grazing pressure, and no such market existed.

Large scale pastoral enclosure was possible for only some livestock owners. Because they had cash and could pay for labour, wealthy pastoralists, shopkeepers, village-based government employees, and livestock traders could afford the costs of thorn-bush fencing larger areas than average households which relied on family labour or reciprocal work parties. Local elites also had sufficient political status to defend these holdings despite their questionable legal status. Several technical repercussions of enclosure also favoured the interests of a certain class of commercial livestock producer. Thorn fencing required the clear cutting of enclosed areas for fencing material, encouraged grass production at the expense of

browse, and rendered an area more suitable for sheep, which are grazers. But sheep were also the most attractive herd species for Somali commercial producers, since sheep (unlike the other local herd species) do not produce items for immediate household consumption, and the entire output of a sheep flock is realized in cash through the sale of animals for slaughter. Urban and village-based absentee herd owners therefore usually preferred to invest in sheep, and by encouraging sheep production, enclosure fostered a market-oriented system of pastoralism attractive to outside investors. These commercially oriented producers further developed novel husbandry practices based on enclosed pastures and specialized in the production of fattened, uncastrated rams used in Somalia for medicinal purposes.

The Malleability of Customary Tenure

The cases summarized in the second part of this report have all involved adjustment to grazing pressure. The immediate causes of maladjustment were diverse - long term population increase and land pressure in Sukumaland, an abrupt decline in resource productivity due to drought in South Darfur, technical change in central Somalia and inter-ethnic rivalry in northern Kenya. In each of these cases, certain producers perceived their pasture resources to be overgrazed, and acted upon this perception and in defense of their individual and collective interests.

These cases contradict the presumption that African pastoralists are incapable of recognizing genuine overgrazing, as defined by their management objectives, or are institutionally incapable of innovatively responding to it, according to their own methods of operation. Borana-Somali inter-tribal relations appropriately illustrate the traditional pastoral response to unacceptably high levels of resource use: frame the problem in terms of external encroachment, or external expansion, and seek a military solution. 'Excessive' internal demand is channelled outwards, and countervailing claims are resolved by the free play of political competition, not by the exercise of administrative authority. What is innovative about the Borana response to the Somali challenge was their attempt to manipulate the administration and draw it into the political arena. Resource control questions were still being settled by competition, but competition by means other than (or in addition to) outright military confrontation and coercion.

In the other three cases - Sukumaland, Somalia and Sudan -the mechanism which regulated the intensity of resource exploitation was the customary tenure system which partitioned access rights among potential users. Part I discussed the variable exclusivity of rights assignments associated with resources of differential value within a single tenure system at one point in time. Much the same pattern reemerges when we examine tenure change over time: When technical, demographic or economic factors raise the value of a resource, and thereby increase demand on that resource, rights of access are more specifically and restrictively defined.

With respect to grazing resources and their rates of use, this approach to controlling resource exploitation requires no restrictions on herd growth by herd owners. An equilibrium between forage demand and carrying capacity can be achieved by either adjusting herd size to suit a stable land base, or by readjusting the land base. Possessing few or weakly developed institutions to effect the former adjustment, pastoralists have opted to manipulate their tenure

entitlements to reflect grazing pressure. They have opted not for regulation but, in formal economics terms, to internalize an externality.

Customary law is particularly susceptible to this kind of manipulation. Abstracted as a set of rules and regulations, pastoral tenure systems have the appearance of formal legal codes comparable, if somewhat less precise, to written law. For livestock producers operating within these systems, however, rights to property are not a foregone conclusion, and the land tenure system is not simply a set of rules to be slavishly followed. In areas where resources are scarce and central government control is marginal, the struggle to control land and water is a continual process in which individuals and groups apply force, tactical cunning, and their rhetorical skill in manipulating the logic of the land tenure system to lay claim to needed resources and to deflect the claims of opposing parties. The tenure systems examined here represent the results of these attempts to control specific, concrete pieces of property in light of broadly understood but ultimately ambiguous cultural principles and uncertain political realities. The ambiguities and multiple layers of claim and counter claim which would render such systems unworkable as written law here provide the mechanism through which political and economic factors continuously restructure the system in response to changing conditions, and lend to customary tenure systems 'a flexibility which the interpretation of [their] rules as legal tenants disregards (Francis 1986: 7).

The malleability of customary tenure makes it difficult for the outside observer to determine when changes within a tenure system amount to the breakdown or transformation of the system itself. On this issue, the opinions of local property holders are also likely to be highly polarized. Any system of property allocation is nothing more than a codification of the steps that individuals or groups may legitimately take to exploit or control scarce resources. Under conditions of rapid technical or economic change, there may arise situations - illustrated in the preceding case material - in which individuals are encouraged to assert an increasing level of exclusive control over a valuable resource. If these attempts at exclusive control are eventually successful, this success will be reflected, in the long run, by changes in the existing system of property allocation. Until these legal changes come about, however, the assertion by individuals of exclusive rights is hardly legitimate, for it will be at best outside the existing legal framework and at worst an outright violation of the terms of the pre-existing property rights system. The legitimate expression of individual rights within one property system is, simply, extortion, fraud and robbery - from the point of view of the old communal system. The legal ambiguities and associated suggestions of expropriation outlined here are likely to recur whenever a system of more open legal access to property is converted under pressure of economic and technical change into a system of more exclusive access.

In sum, internalization may avert Hardin's tragedy of the commons, but it would appear to do so at a price - by subverting the institutional stability and legal transparency which sustains 'assurance' regarding the management of collective property.

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