

insights

Environmental Security

Human security requires an assured basic income, physical/economic access to food and health care, freedom from physical violence and threats and the protection of basic human rights and freedoms. 'Environmental security' (access to clean water, clean air and non-degraded land) is only part of the whole and it is intimately tied to these other concerns.

This issue of *Insights*, drawing on the findings of a number of projects funded through the Economic and Social Research Council's Global Environmental Change Programme, reports evidence from vulnerable regions which reveals the complex nature and the significance of the links between environmental and other dimensions of security. It leads us to question two myths which have developed around human management of natural resource systems: first, blanket assertions of the '...increasing population pressure on severely degraded environments is leading to civil conflict, war and mass migration...' variety and, second, the assumption espoused by many development agencies that environmental security will be enhanced if the responsibility for managing the environment is somehow 'handed over' to community organisations.

Discussions of environmental security are frequently extremely simplistic, treating the issues only in terms of rapidly increasing populations pressing on poor natural resources. This leaves out three crucial, complicating factors: natural resource endowments vary widely over space and time; resource-poor environments prompt diversification in household activities; and insertion within the complex of market and subsistence activities is variable as between communities, groups and individuals.

The notion of flexibility is key to understanding how people try to manage environmental resources securely and how they cope when the environment proves insecure. Where population density is highest, biological conservation can be an important part of community environmental management (Adams and Mortimore, page 2, based on research in different ecological zones in northern Nigeria). 'Natural' crises are

most commonly due to wide and unpredictable variations in rainfall. Their effect is highly selective. Farmers respond by diversification of activities both in the management of different natural resources and in the pattern of livelihood generation. Success or failure depends to a considerable extent on their strength or vulnerability in markets, including the labour market, as well as on resource fragility.

Adams and Mortimore argue that households spread their activities, including participation in distant labour markets, in an extremely flexible way from year to year to minimise risk. Batterbury (page 2) suggests that migration is also an important part of a longer-term strategy to reduce *exposure* to risk. Much, perhaps most, household labour in Africa is provided by women, although their practical involvement in rural areas varies between ethnic groups and locations. Contrary to widely accepted views, David (page 4) argues that male migration has seldom made women more vulnerable in rural Africa, nor has it given them any extra decision-making power or opened up new livelihood possibilities for them that might improve environmental management.

Insertion in markets takes place even in the remotest locations but it is a double edged opportunity. It frequently leads to social differentiation within the rural community, particularly with respect to the control that different groups exercise over resources. Woodhouse (page 3) shows that in areas that are vulnerable environmentally, emerging private economic opportunities often serve to undermine, rather than strengthen, community solidarity.

Another common assertion is that war and famine are the result of increasing competition for scarce natural resources. The research undertaken at Leeds and Bradford universities (page 3) should lead us to question this and to appreciate that the main effect of warfare is to cause (rather than be caused by) environmental insecurity. War and famine, like much else in the rural milieu, cause social and economic dislocation which falls particularly heavily on the poorest groups.

What are the lessons of these studies

for policy? Apart from the need to target the most vulnerable groups wherever environmental security breaks down, they provide a number of policy leads. First, implementing United Nations Conventions, like that on Desertification, should begin by acknowledging that local community institutions serve different groups within the community (and many outside). Second, to be able to manage the environment sustainably, individuals and households need to be capable of reproducing themselves, they need to be socially sustainable. The 'entitlements approach' represented in this issue by Leach, Mearns and Scoones (page 4) suggests conceptual ways in which this approach might be developed. It focuses on the social institutions which regularise patterns of behaviour between individuals, groups and the natural environment. This provides the means by which the environment is 'managed'. Like 'sustainable development' environmental security is unlikely to be fully attainable in poor, precarious rural settings. But in policy terms we can move ahead by setting 'doomwatch' scenarios on one side and building on the knowledge that emerges from research such as that reported here.

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Environmental Security in the Nigerian Sahel

The widely accepted belief that human impact due to rising populations inevitably leads to environmental degradation in Sub-Saharan Africa is being challenged by many researchers. Rural producers make decisions to handle difficult environments and unpredictable economic and environmental change, and, under the right conditions, small farmers can and will invest in their land as populations rise.

The research reported here explored the links between livelihoods, crops and soil fertility at farm level over four growing seasons (1993–6) in four villages in the Sahel Zone of northern Nigeria. The villages stretch from the Kano Close-Settled Zone north and east through progressively drier areas in Yobe and Jigawa States. The villages near Kano have had an annual rainfed agricultural system under continuous cultivation for at least a century. Further away, villages have less intensive agricultural and agropastoral system.

The villages lie along a gradient of

declining rainfall, declining population density, declining intensity of farming and declining biological productivity. In each system the intensity of land use is adjusted to the land:labour ratio under available technologies although conservation of biological potential is most careful where population density is highest. Increasing population density does not lead to increased environmental degradation.

The villages are also on a gradient of accessibility to markets for produce, inputs to production systems, and labour. Markets are as important as rainfall to livelihood security, especially when production failures due to drought impel greater dependence on alternative off-farm incomes. Household resource portfolios combine subsistence with market strategies, resident with migrant activities and farm and off-farm production and services.

As land use intensity declines along the research transect, risk increases. The main threat to environmental security is variation in rainfall (both annual rainfall

amount and the timing of the short rainy season). Its significance is greatest in the driest villages. The main indigenous response to such risk is flexibility, founded on both diversity of choice in natural resource management and in the selection of livelihood strategies.

Particular dimensions of flexibility include flexibility in the way labour is used in farm work, flexibility of field location in space and time, flexibility in the diversity of crops and varieties grown, flexibility in the use of grazing resources, flexibility in the range of economic trees exploited and flexibility in the adoption of farm and off-farm livelihood strategies.

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Security and Change in Southwestern Niger

For many decades, the farmers and herders of the complex semi-arid landscape of Southwestern Niger have faced periodic famine and food shortages, poor investment opportunities and erratic local government support and extension services. Parts of the landscape have infertile and degraded soils with severe land pressures in some areas. Development interventions have been patchy and inconsistent, reflecting the short-term politics of donors, and poverty is still endemic. A high percentage of the region's farmers migrate seasonally to obtain cash for household needs and social obligations.

Conditions in such dryland regions have been used by 'doomwatchers' (notably Robert Kaplan and Norman Myers) to suggest that a combination of environmental degradation, population pressures and political negligence are helping to drive social breakdown and ethnic strife across West Africa and forcing competition for scarce resources in the Sahelian drylands and conflict in the cities where 'environmental refugees' are clustering. These 'environmental security' arguments are appealing to policymakers favouring population restraint and good governance.

There are far greater complexities in human behaviour and resource endowments than the 'doomwatchers' would have us believe. A field study in Niger in an area 55 km east of Niamey, shows that :

- resources are changeable and spatially variable. There is a highly irregular pattern of soil erosion and deposition across plots and selective intensification of cultivation using manure and occasional fertilizer inputs. Soil and vegetation resources have changed considerably in living memory, cotton has been abandoned, and there have been considerable fluctuations in fertility and biodiversity. Although the percentage of woody biomass has fallen in the surrounding zone as fuelwood supply to Niamey has increased, wetter areas and clay-rich soils continue to harbour a variety of important trees and shrubs, protected for their nutritional and pharmaceutical value.

- the effects of poor soil fertility and wind erosion of agricultural land are mitigated by diverse income generating activities. Over the last fifty years, male outmigration and the range of commercial activities have increased and women's contributions to the household economy have become more cash oriented, aided by improvements in transport. Nonetheless access to income possibilities remains skewed; gender, age, social and religious sanctions can be restrictive, particularly for women. Outmigration rates tend to increase during good farming years, because a high initial cash investment is required for travelling.

- land use change is characterised by the dispersal of cultivated plots over a larger area since the 1950s. The effect of colonisation was to cease clan and inter-ethnic warfare and slavery and although

land conflicts do exist, serious disputes are rare. The application of Islamic inheritance laws has led to smaller average plot size and fallow lengths have fallen from 10 to 3–5 years over the past forty years. Yet population density is still low, at under 20 persons km².

These findings challenge the 'environmental security' argument. Land degradation is localised, and certainly not universal. Farmers engage in migration to obtain short term cash benefits; they are not abandoning their lands because of unacceptable population levels. Rural communities exploit variability and diversity in environmental and economic conditions, but farmers' responses are highly individualised. Community-based development initiatives, therefore, have rarely proved sustainable in this region (in marked contrast to highly publicised resource management successes in central Burkina Faso, or Niger's Central Valley), and are unlikely to do so unless their benefits are real and immediate for individuals.

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Land, Water, and Local Governance in Dryland Africa

The insecurity so often identified with African drylands cannot, according to recent research in four African countries, be simply attributed to external disruption of indigenous environmental management systems. Yet most current environmental proposals, e.g. the UN Convention to Combat Desertification, start from an assumption that misguided state development policies have been to blame and so recommend the devolution of natural resource management to local communities and reform of the institutional and regulatory framework to provide security of land tenure for local populations.

Case studies were carried out in 1994–6 in four African countries (Botswana, Kenya, Mali, South Africa) to document how local institutions currently manage the water-related resources (streams, swamps, small dams, river valley land) that are key to dryland ecologies. The findings suggest that expectations of community-based natural resource management schemes are too high. Such schemes may not achieve either poverty eradication or environmental security objectives. This is because:

- profound and rapid changes are

evident in resource use in all locations even though three of the four cases are in relatively remote areas.

- in 3 out of the 4 cases, changes are underway because of the exploitation of water for agricultural intensification (market gardening in Kenya and South Africa, rice production in Mali). The exception is Botswana, which concerns increasing control over access of livestock to grazing as well as water.
- in all cases state policy influences local developments to some degree, often by upholding customary or private tenure rights. But the direction and pace of agricultural intensification is largely dictated by private interests (local and non-local) in pursuit of emerging economic opportunities. Many resource allocation decisions are being taken within local community institutions.
- in terms of environmental security, the changes taking place in land and water use raise ecological concerns which are straightforward, such as pollution from indiscriminate pesticide use, and others which are ambiguous, such as whether tree felling or stream diversion should be considered 'degradation'.

- there is growing differentiation of control over land and water, notably through changing interpretations of customary rights and obligations. This is taking place irrespective of the level of government agency involvement in local land and water use. Community-based management of land and water, of itself, thus offers few guarantees for the social dimension of environmental security or 'poverty eradication'.

Policies seeking to increase environmental security need a shift in focus from a simple counterposing of government agency against that of local community to an explicit recognition that rural production patterns are dynamic and strongly influenced by markets, that the power structure within communities evolves and that the interests of various community elements are fostered differently by outside intervention.

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The Environmental Legacy of War

War and famine are often both thought to be symptoms of the same underlying problem: increased competition for environmental resources which are becoming depleted. This perspective makes the simplistic assumption that there is a general degradation of the environment. There is no evidence for this assumption either in the Horn or in Southern Africa, where recent research has been done on the links between warfare and the environment.

Where land struggles have occurred in this region they have not been sufficient to spark systemic violent conflict, and have only ever been linked to such conflict when elites have politicised the issues. On the other hand, conflict and the ensuing upheavals for control of terrain or over who should be the local authority (whether due to internal or external intervention, guerrilla or conventional warfare) have had a major impact on the environment and on people, especially the poor.

Conflicts have thrown mechanisms for management of common land into confusion and cut people off from its products – fruits, honey, fodder, thatch, fuelwood – just when they need these supplements to diet and livelihoods the most. There are 'mined environments', where people are cut off long term from

arable and grazing lands. Another legacy has been widespread deforestation (the burning and other destruction of woodlands) except where areas were completely depopulated or sown with land mines.

War returnees have to be provided land, with secure rights, to rebuild their livelihoods and social networks. But in many respects returnees share the predicament of many locally impoverished people, who have consumed, sold up or lost their productive assets. Not all households, even in the same village, suffered the same loss of livelihoods. But many lost precisely those resources they needed to build on for 'recovery'. A majority in many farming areas had no oxen for ploughing. Other livestock herds – important sources of food and cash for other needs – were so reduced that, without food aid and income support, their owners are forced to go on selling each year's natural increase. They never recover.

Another finding is that shortage of adult labour has been a devastating problem for some households, particularly those where women are left on their own with children. They are condemned to poverty unless family members send remittances.

The effects of war and famine thus reinforce each other, especially for the poorest of the poor who do not have 'entitlement' to meet basic family food

needs. In general, policies for recovery must acknowledge the legacy of warfare on the environment and on people's capabilities to generate their livelihood and include:

- food aid or other income support, targeted to the most vulnerable, continuing beyond the end of 'emergencies' to meet 'structural deficits' of food, and providing time for people to build their income-generating capacities.
- 'food (or cash) for work' schemes; but although these may reduce aid dependency for the able-bodied, they can exclude those families already overwhelmed by labour demands.
- people's longer term development needs must have priority. This requires the adoption of a new agenda of sustainable interventions to ensure access to land, effective participatory management of common land, imaginative credit and other means of providing productive assets, and job creation.

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Women, Resource Management and Migration in the Sahel

Migration is not a new phenomenon in the Sahel. For centuries survival strategies in such a risky environment have hinged upon movement in search of new lands and pastures, for trade and conquest. Over the last forty years, however, migration has certainly increased. Movement to the cities has contributed to the quadrupling of Sahelian urban populations while many migrants also go the West African coastal fringe, Europe and the Gulf States.

Research carried out in four sites in different parts of the Sahel (Diourbel, Senegal; Bankass, Mali; Passoré, Burkina Faso; and El Ain, Sudan) shows that although migration takes diverse forms in different places and is constantly changing in response to circumstances, the effects on women and on agricultural

production are similar.

- the out-migration from these regions in the Sahel does not leave behind large numbers of lone women. The extended family structure in the three West African cases means that, in the absence of their husbands, most migrants' wives continue to live in their husband's compound or in the care of his extended family. It was only in El Ain, Sudan where smaller conjugal units are the basic unit of production and consumption, that women were found by this research to become *de facto* heads of household and more vulnerable.
- the movement of men away from rural areas (whether short-or long-term) does not significantly disturb the gender *status quo* in the rural Sahel. Throughout the region, men retain the right to make decisions about farming. Women left behind lack tenure rights and decision-

making power over resource management. Women become a more integral part of the agricultural workforce but their decision making power remains weak.

- male out-migration postpones initiatives to improve agriculture in the village. As the young dynamic members of each community leave, it is the older male members who continue to take decisions and manage the land.

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The Institutional Dynamics of Environmental Change

In *Agenda 21* and other international declarations on environment and development it is widely accepted that public action on environmental matters needs to be implemented with 'stakeholder' participation and the active involvement of local communities. Community-based approaches used to be prominent in rural development programmes, but from the 1950s they met with increasing criticism on the grounds that they took too little account of power and social difference. Now uncritical notions of community have been reinvented in the context of public action around global environmental change, in this case allied with equally problematic, often illusory notions of the 'balance of nature'.

Orthodox approaches to improving environmental security usually focus on natural resources in the aggregate and their availability to society as a whole. This research, by contrast, highlights the differentiated and dynamic nature of both communities and their local environments and calls into question simplistic notions of the relationships between the two. It explores the management of watersheds, forest resources and protected areas in India, Ghana and South Africa respectively. The focus is on the diverse sets of formal and informal institutions that influence who has access to and control over resources,

and arbitrate contested resource claims.

Take the example of the management and collection of *Marantaceae* leaves in forest-savanna transition zone, commonly used for wrapping food and kola nuts. It cannot be assumed that their availability in nature means everyone is equally able to benefit from them. It tends to be women who gather and sell the leaves as an important source of seasonal income, working in cooperative groups.

- On state forest reserves, permits issued by the government Forest Department are formally required to gather *Marantaceae* leaves, along with other non-timber forest products. Outside reserved forests, customary law and other codes of behaviour influence who has rights to collect the leaves.
- At times, those licensed by the government and those whose claims are legitimated through customary law come into conflict. The authority vested in a locally appointed 'queen mother of leaf gatherers' can sometimes help arbitrate such contested claims.
- Even the most legitimate claims may not translate into secure command over the leaves themselves, if it is difficult to mobilise work parties to gather them. Women, especially junior wives, may not have control over their own time use, given competing demands within the household.
- The availability of *Marantaceae* leaves is not simply left for nature to decide. The deliberate manipulation of forest

follows through burning practices can enhance their growth, for example, as can the prior cultivation of cocoa, influenced in turn by fluctuating international prices and domestic pricing policy. The local landscape is transformed over time by such management practices, whether intended or otherwise.

Understanding the interplay of such formal and informal institutions, operating at various scale levels from micro to macro, can help pinpoint what kinds of policy or project interventions are most appropriate. Whether the objectives are to assist certain marginalised social groups, or to protect certain components of the environment, such a desegregated approach is essential for predicting or evaluating the outcomes of alternative options. Equally importantly, applying participatory methodologies to flesh out notions of institutional dynamics can also suggest opportunities that exist for innovative public policy and action in different settings.

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