Natural Resources Systems Programme

Research Highlights 2000 - 2001

Poverty reduction through partnerships in natural resources research

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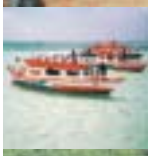

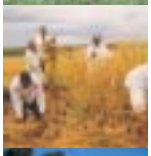

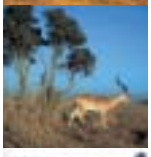

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NRSP Research highlights

HIGHLIGHTS

Poverty reduction through partnerships in natural resources research

The Department for International Development (DFID) is the British Government department responsible for promoting development and the reduction of poverty. The central focus is a commitment to the internationally agreed target to halve the proportion of people living in extreme poverty by 2015. To contribute to achieving this objective, DFID funds a group of programmes that cover various aspects of natural resources research. One of these is the Natural Resources Systems Programme (NRSP).

NRSP aims to deliver new knowledge that can enable poor people who are largely dependent on natural resources to improve their livelihoods. Research focuses on the integrated improvement of the management of land covering soil, water, vegetation and organic residues. It aims to find ways by which strategies for natural resource management can enable the poor to build their livelihoods and move out of poverty in a sustainable way. The new knowledge that the programme generates is of varying types. It includes specific technologies for land care, better strategies for natural resource management and better methods for a range of clients to acquire knowledge of natural resource technologies and strategies. These include poor individuals, households and communities, local professionals and policy makers who are influential in natural resource sectors.

NRSP is a 10-year programme that began in 1995. It is implemented as contracted projects undertaken by research institutions with expertise in natural resources management. During the past year, 16 projects were completed and 26 new ones were commissioned, of which 4 will be led by overseas organisations.

Important elements of the strategy are:

- Poverty focused demand led research that is designed to be relevant to specific defined groups of the poor.
- Use of a systems approach in both the design of research and in the way it is conducted. Research pays detailed attention to the technical, social and institutional inter-relationships that pertain to a piece of research.
- Partnerships. In conducting the research projects, UK-based researchers work in partnership with natural resources specialists overseas. NRSP is pro-active in encouraging overseas organisations to submit research proposals and was pleased that the total of overseas-led projects rose to 6 during the year, with an additional 3 proposals in the pipeline. In addition, participatory methods are used in order to involve both intermediate and ultimate beneficiaries of the research (stakeholders) from an early stage.

The programme covers six production systems.

High potential production systems are found in areas with favourable soils and climate. They are relatively well developed and support some of the highest population densities in the world. They produce surpluses that feed people in both urban and rural areas. Target countries are India, Bangladesh and Kenya. *Learning to communicate on farmers' terms* (p9) is about farmers in Bangladesh who are concerned about their rice yields. Researchers tend to respond with more

field trials but farmers see a complex picture of high input costs, unreliable suppliers and a lack of knowledge of alternative cash-earning crops. New communication tools are needed to help them to assess what options are available and aid their decision making on the integrated management of their farms.

Hillsides production systems are characterised by farming activities on steep slopes where difficult terrain results in poor accessibility, limited infrastructure and impoverished communities. Target areas include high altitude areas of Asia and Latin America and mid-altitude hills in Uganda. *Helping remote communities to help themselves* (p6) describes how marginal farmers in remote communities in Bolivia are being empowered to find and implement their own solutions to natural resource management problems with the support of local professionals.

Semi-arid production systems occur in the tropical dry lands where agricultural activities and livelihoods are constrained by poor natural resources. Production of crops must be achieved in the short wet seasons requiring intense and exhausting work. *Droughts – just poor rainwater management?* (p19) describes the resurgence of interest in rainwater harvesting in Tanzania and the changes in thinking about rainwater runoff as a valuable resource for farmers rather than a problem that causes soil erosion.

Can grassroots influence policy? (p15), focuses on the rapidly diminishing Common Pool Resources (CPRs) in India on which many poor and disadvantaged people depend for their livelihood. It calls for a better appreciation of CPRs among planners and studies to assess their cost effectiveness and to evaluate innovative ways of managing them.

Living with wildlife (p22) examines the challenges facing farmers and pastoralists who live close to national parks in Kenya. A policy of segregation has not proved very successful either for the people or for the wildlife and so alternative strategies are explored that enable people to improve their livelihoods while living alongside wildlife.

The forest agriculture interface refers to areas that are in transition between primary forest and settled agricultural land use. Such areas are found in Brazil, Nepal and Ghana. For this year, there is no feature article for this system.

The land water interface refers to both coastal areas and inland aquatic systems such as floodplains. Priority areas include the Caribbean and Bangladesh. *Knowledge does not wear out* (p12) describes how existing information about coastal development in the Caribbean was brought together from a wide range of sources, in innovative ways, so that planners could use it and so avoid having to re-invent the wheel.

The peri-urban interface is a very dynamic system driven by urban development. Rural activities pre-exist and, as urban activities proliferate and grow, linkages relating to them are built from either the town or the countryside. *Start with the children* (p3) demonstrates how educating children about water quality and its importance to community health and involving them directly in practical monitoring activities can be an effective way of reaching and benefiting the wider community.

Two cities – one problem (p25) reviews a book that brings together NRSP's past research in two target city regions, Kumasi in Ghana and Hubli-Dharwad in India.

Improving the poverty focus of natural resources research (p26) applies to all the production systems and announces two recent publications on poverty-focused natural resources research.

These are just some examples of the scope of exciting work of the Natural Resources Systems Programme and its support to reducing world poverty. A complete list of on-going projects is provided at the end of this document.

Start with the children

It is often difficult to 'teach old dogs new tricks' so why not start with the children. Introducing simple water quality test kits in Junior Secondary Schools in the city of Kumasi in Ghana has not only helped young people to become more environmentally aware and appreciate the important links between water quality and community health but it has also helped to disseminate this information to the older generations.

IN KUMASI

Community health and environmental degradation around the fringes of major cities – the peri-urban areas – can become a major issue as their populations expand rapidly and infrastructure is unable to keep up with the pace of development. The peri-urban areas around Kumasi are particularly vulnerable as more agricultural land is turned into housing. The city lies across a major drainage divide and so water draining from the surrounding rural areas flows through the suburbs into the city and then out again into the countryside. This brings with it a range of water quality problems that affect not only the city but also the peri-urban areas where the population is usually less well equipped to deal with them.

A research programme focusing on Kumasi has been examining ways of making communities more aware of the environmental problems they face and equally important what they can do to solve them. It was decided that a good place to start was in the local junior schools.

THE PROBLEM

Transforming agricultural and forested land into housing and roads can have a dramatic impact on local hydrology. The natural landscape, which tends to absorb rainfall, becomes more impervious and this increases the intensity and volume of rainwater runoff into streams. Urban industrial growth just adds to the problem as more diverse solid and liquid wastes find their way into the water and increases the pollution. Unfortunately stream water is also the principal source of domestic water supply for many peri-urban communities, especially the poorer ones who cannot afford to buy clean water or construct and maintain boreholes. The consequences for community health under these circumstances can be disastrous.

Transforming agricultural land into housing and roads can have a dramatic impact on local hydrology

An alternative source of domestic water supply is groundwater but this needs regular recharging. At first sight this might not seem to be a problem in Kumasi where the long term

average annual rainfall is over 1500 mm. But a closer look at more recent records shows that not only is rainfall declining but the number of rainfall days has also fallen in the past 10 years. So reductions in rainfall and increases in runoff have meant that water that used to infiltrate and replenish the groundwater is no longer available for this purpose. Add to this the significant population growth over the same period of between 0.25 to 1.0 million people and the fact that most live beyond the range of the Ghana Water Company's piped supply, means that the case for protecting the stream flows and groundwater resources is now overwhelming.

TACKLING THE PROBLEM

When the local people were asked how they perceived the problem and its solution the answer was that the water supplies were inadequate and more boreholes were needed. The water quality issue as well as the effects of increasing groundwater abstraction on the sustainability of the supply were not well understood.

In order to improve this situation more information was needed not just on the extent of pollution but also on how communities use water, how they perceive water resources and how they go about making decisions that affect their environment and water resources in particular. Eight communities in two sub-catchments were selected for more detailed investigations.

Two years of recording water quality in selected streams provided a grim picture of pollution. Both organic and inorganic pollutants increased as water moved downstream through the city.

Although there was evidence of some dilution effects resulting from urban runoff during intense rainstorms, not only was the river water clearly (and visually) polluted downstream of the city, there were also significant levels of pollutants in a hand-dug well indicating that local shallow groundwater was also becoming contaminated. At a village downstream of the city a preliminary investigation showed that water used for drinking contained heavy metals in excess of safe drinking water standards and that there was a build up of heavy metals in fish tissue and in floodplain sediments.

Surveys of gender roles and users' attitudes showed that women were mainly responsible for domestic water collection yet they were not usually involved in village decisions affecting water quality such as the siting of pit latrines or waste dumps. People were generally aware of the growing pollution in the streams and its link to health problems. They could also see that children were suffering most because they tended to be more careless with hygiene.

Inadequate potable water, inadequate toilets and sanitation, poorly-sited or poorly-maintained refuse dumps, soil erosion, sand-winning pits, encroachment on water courses, and institutional weaknesses were among the main problems that people identified. But ignorance about the relationships between health, inappropriate land-use practices and water contamination was widespread. There was little or no perception that many of these problems were linked to each other or that actions taken in one part of the catchment could have repercussions elsewhere. Putting in more boreholes was seen as the main target.

GETTING THE MESSAGE ACROSS

A key message to get across to the communities was that simply putting in more boreholes was not only expensive but also not necessarily the best long-term solution to their problems. In any case few communities around Kumasi have the resources to put in new boreholes and some struggle to maintain those already installed. What made more sense was to protect and make better use of existing water resources emphasising management of the whole catchment rather than individual locations within it.

The best vehicle for this message was thought to be the local Junior Secondary Schools. Simple water quality test kits were introduced into schools located close to the project water quality sampling points. In this way the schools' test results could be monitored and their measuring techniques refined. Resulting from this was a growing awareness among school children about environmental issues and in particular the effects of water quality on community health. There was evidence too that schools were spreading this knowledge to the wider community through presentations to their villages committees.

Other means of dissemination were also developed such as cartoon style leaflets for distributing among communities and explanatory diagrams/illustrations for use at small group meetings. Practical demonstrations of water harvesting, soil erosion control and the use of protective vegetation were also constructed and evaluated in target communities.

Surveys are now underway to find out just how well this new knowledge and the dissemination process has been instrumental in raising awareness among communities and how this has changed attitudes towards the protection and better use of water resources.

GOOD PRACTICE

All stakeholders, including polluters, are now being encouraged to get actively involved in developing a manual of 'good practice' - Watershed Management Framework. This is designed to help village committees make more informed decisions about land and water use. A prototype is being tested and includes rules for:

- Catchment surface protection
- Water resource protection
- Land use criteria
- Land allocation procedures
- Environmental self-monitoring
- Roles and responsibilities of the full range of stakeholders
- Consultation protocols for reporting environmental problems
- Identification of sources of funding for environmental micro-projects.

R7330 Peri-urban natural resources management at the watershed level, Ghana

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Helping remote communities to help themselves

Helping marginal farmers to improve their livelihoods is a challenge for NGOs and governmental organisations. But when communities are in remote places, in steep ravines or on isolated plateaus, many days travel from the nearest centres of administration, the challenge is even greater, especially when local services are not well adapted to respond to their needs. One example is the communities living in Tarija in Bolivia that farm in the valleys along the edge of the Andes at altitudes between 2000 m and 4000 m. They grow a range of rainfed and irrigated crops such as maize, vegetables and potatoes, small orchards of peaches and quinces and graze cattle and sheep. However, there is widespread poverty and people have to cope with many naturally occuring problems such as droughts, floods, frosts and hail as well as poor soil fertility, salinity along river terraces and pests and diseases that attack their crops and livestock. The local municipality does not have the resources to help them sustain and improve their livelihoods and there are few local NGOs who can provide the advice they need.

How can such remote communities be helped when local institutions are so weak? One solution was to go directly to the communities themselves and to find ways of empowering people to find and implement their own solutions. It was anticipated that they would need specialist technical help to do this and so the plan was to link the communities with local professionals. Once this process was underway the professionals would withdraw leaving communities to tackle their own problems but they would be available for advice when it was needed.

Communities quickly adapted to the task of identifying problems and finding practical solutions

REACHING THE POOREST

Although the majority of people living in Tarija are poor, this project aimed to include the poorest of the poor. But reaching them is not easy. It is the more affluent that come forward first, are more vocal in meetings and are more likely to experiment. The poorest households are less able to migrate regularly to generate cash and are more vulnerable to the effects of environmental hazards. They are not always able to attend community meetings or participate in community-led activities and may live some distance from the centre of the community. Households in one community were thought be the poorest if there was little family labour available, or little means to hire help. In another it was a lack of land

ownership and in a third it was linked to a lack of livestock. To overcome this, information was sought from local community leaders who knew families well and from schoolteachers who carry out the annual census.

THE APPROACH

The central hypothesis of the project was that it must be local people who identify and articulate natural resource management issues. They should not be devised or prioritised by outside professionals. However, local professionals do have an essential role to play not just as technical advisers but also as facilitators for community discussions. This is a new approach in Bolivia as local professionals are more used to taking the lead rather than listening to their clients' needs.

Two local professionals were employed by the project, a veterinary surgeon and an agriculturalist and regular monthly meetings were initiated with the selected communities.

They were encouraged to listen to people and to adopt a diagnostic approach by facilitating community groups to discuss common problems. The professionals contributed their scientific knowledge alongside community-proposed solutions and then helped the communities to implement their chosen solutions. One measure of the success of meetings was demonstrated by the long distances that people were willing to come to attend them, some walking for 2 hours and more. Another was the way in which the meetings attracted people from other communities wishing to participate.

PROBLEMS AND SOLUTIONS

Communities quickly adapted to the task of identifying problems and finding practical solutions.

Managing the grazing land and livestock

Livestock is an important element in the lives of everyone and good reliable pasture is vital. Animals must be moved constantly in search of it and this consumes much time and effort. Cattle go on the hoof for long distances in the dry season to areas where there is more rainfall and better grass. Sheep are also continually on the move and are cared for by the people from poor households. Good grazing is essential at lambing time and to see everyone through periods of drought.

People are now beginning to experiment with alternative livestock management practices. Pastures are being improved by collecting seeds from the best pasture grasses and planting them in protected fields. Animals are being exchanged between communities to enhance bloodlines and improve their quality.

Tackling disease

Diseases are a problem both in livestock and in crops. People are learning how to give intra-muscular and sub-cutaneous injections so they can apply some remedies themselves. The vet is designing flash cards to help owners diagnose common ailments and avoid the need for professional help.

Fruit trees have rarely been pruned or treated. Farmers are now realising that pruning mature trees is beneficial. Through the project, people from poor households are learning the skills of pruning and are able to earn money working for those farmers who own fruit trees. As a result fruit harvests have doubled in a year in some areas.

The local agriculturalist has suggested using cheap, partly home-prepared and environmentally friendly sprays to tackle fruit flies, borers and mildew. He has shown people how mixtures are prepared and applied. Up to 80 per cent of households in the project area are now using these to treat field crops and trees.

Improving cropping

The local agriculturalist is helping farming families to map their soil types. Areas of good soil have become apparent that are not intensively used at present.

Some groups are experimenting with new crop varieties such as short-season potatoes that may mature before the worst frosts. Some farmers already practice soil conservation and maintain soil fertility and the agriculturalist is keen for them to show others their methods.

Communicating with others

Everyone listens to the radio and goes to local fairs and so they provide excellent vehicles for communication. In collaboration with Radio Tarija, run by a Catholic NGO, professionals are making fortnightly broadcasts about the work in the communities. They inform others about the progress being made, about how to attend meetings and workshops and how their community can also benefit.

Reaching the poorest?

Local professionals have been targeting the poorest households so that they can monitor how useful community actions are for them.

The poorest people were found to be facing many problems besides those of natural resources. Many cases were reported of poor health, low self-esteem, alcoholism and domestic violence. Although the project did not tackle such issues directly, it is anticipated that improvements in their livelihoods will have wider benefits.

THE NEXT STEPS

The project focus so far has been on developing community interaction between local professionals and community groups. This has proved successful in a number of very practical ways but the time has now come when the local professionals must stand well back and let the communities run things themselves. The acid test will be communities coming forward with their own natural resources plans for funding and inclusion in local government annual plans.

This approach also needs replicating if other communities are to benefit. The local municipalities are now being included in the planning and design of further similar initiatives. The project's research, built around its developmental activities, has monitored the community demands and the ways by which local professionals have worked with communities to meet them. This information will be used to define a mode of service provision that is appropriate for remote communities.

R7584 Community-led tools for enhancing production and conserving resources

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More details of this work are available on: www.geog.leeds.ac.uk/research/andes/fragenv.htm

Learning to communicate on farmers' terms

Over the past decade, Bangladesh has achieved considerable increases in rice production enabling this densely populated country to become self sufficient in this food staple. Agricultural research has played a role in this achievement and, as a consequence, research to ensure sustained increases in productivity of food staple crops still predominates. Implicit in this emphasis is the assumption that increased productivity of commodity crops will lead to the improved economic well-being of those who depend on agriculture for their livelihood.

A MORE COMPLEX PICTURE

Whilst this research is important, it is not clear that it does enable farmers and landless workers to improve their livelihoods. They perceive a more complex picture not just of low yield but also low and unfair prices, high input costs and a lack of organic manures resulting from pressures on feed supplies and animal ownership. They are aware that they lack knowledge of new technologies but they perceive lucrative markets for alternative crops and are interested to assess new varieties and new techniques. If farmers are to improve their livelihoods they need better access to information. This means exploring more effective ways in which extension, research and other service providers can interact with farmers so they can begin to respond to the opportunities they perceive.

CHANGING THE SYSTEM

The livelihoods of those who depend on natural resources have many elements. The concept of Integrated Crop Management (ICM) is seen as one way of capturing this broader dimension in farming and moving beyond the idea of commodity based productivity. ICM is a whole farm approach providing a basis for efficient and profitable production that is economically viable and environmentally responsible. It can be achieved through a combination of crop rotation, use of organic residues, fertilisers and crop protection chemicals, integration of livestock, cultivation choice, variety selection and improved energy efficiency, together with a positive management plan for environmental issues.

Although the underlying principles of ICM are well established, as far as resource-poor farmers in developing countries are concerned, this definition is incomplete. It must include access to information in forms from which poor farmers can benefit. Adding communication to ICM means recognising that the current pathways of delivering scientific research to farmers via extension is not working well. A more collaborative approach is needed that draws on the potential contributions of all stakeholders and recognises the synergies between their perceptions, skills and capabilities. Farmers need to be able to bring their views to bear on how agricultural research supports rural livelihood systems and on how extension staff work with rural people.

IS ICM HAPPENING IN BANGLADESH?

Broader and more intergrated approaches have been promoted in Bangladesh for at least five years as part of a reaction to the agriculturally

biased approach to flood control in the country. But just how extensively ICM is promoted and practised by farmers is not known.

Asking the farmers

Groups of farmers and landless workers were asked to explore their agricultural enterprises using Scored Causal Diagrams. They first identified a common end problem of 'low income from rice production' from which came their perceptions of the causes. Low prices for rice and high input costs were high on the agenda and blamed mainly on the inefficiencies and corruption of marketing channels. Lack of storage on the farm also meant that buyers, not farmers, determined the price. Low yield was also a factor and this was attributed to low soil fertility as a result of excessive use of inorganic fertiliser and a lack of organic fertiliser. This in turn was linked to the decline in cattle numbers, associated with farm mechanisation and more intensive land use for cropping.

Farmers were clearly aware of the complexity of factors that affect their livelihoods. A poor quality diet was blamed on the reduced animal population and also on reduced fish stocks in rice fields resulting from the high levels of pesticides and fertilisers in the water. This led to poor health that affected their ability to work.

Interestingly, all the groups were well aware of the benefits of 'modern' technology but recognised they needed more information to make use of it. They knew, for example, that improving fertility and pest management could increase yields but they did not know how to use inorganic fertiliser properly.

Asking the extension workers

Representatives of 22 organisations, responsible for delivering information and agricultural support, were brought together to share ideas on how their programmes might support the integrated nature of agricultural enterprises and to discuss ways in which farmers, researchers and intermediaries can interact. It was clear from these discussions that most intermediaries now follow a farming systems approach and recognise the need for systems thinking in agricultural extension and technology development. However, they agreed that their general strategy in the past was to ignore the individual nature of farming livelihoods and to treat farmers as homogeneous groups from the point of view of communicating agricultural knowledge.

There was frustration that a large body of available technical research was not reaching farmers. Whilst programmes were in place to try to achieve this, analysis of the technologies from the national research institutes suggested that predominantly the technologies and research findings were judged by scientists rather than farmers, to be appropriate for dissemination. There was little evidence that technologies were validated by farmers.

Asking the scientists

A literature review confirmed the rather narrow nature of research in agriculture. Most scientific studies were targeted on crop management and increasing yield rather than the wider issue of how these farming activities impact on livelihoods. Problems were also apparent with data obtained from research stations where conditions differ from those on farmers' land. Even on-farm research excluded farmers from its management and so ignored the long standing recognition that farmers are active experimenters and have much to offer in terms of farming practice.

ICM IS HAPPENING BUT...

Evidence suggests that elements of ICM are happening in Bangladesh. Farmers recognise the interaction of farming activities with their livelihood-related outcomes. Intermediaries are promoting more integrated farm management systems such as fish-rice systems, crop rotations and the incorporation of livestock in ways that are beneficial to farmland and crops.

Priority setting in research and extension is still in the hands of the professionals but they realise that farmers must become part of this process and there are signs that they are beginning to base their planning on an assessment of farmers' priorities and needs. This development has also shown the importance of communication and information exchange, rather than a simpler concept of delivery of technical information. Agricultural research findings must feed into the knowledge base on which farmers make their livelihood-related decisions. This is even more important as agriculture in Bangladesh continues to shift from subsistence farming to production for sale and the range of agricultural products diversifies.

A key question is whether significant institutional changes will be needed to support the changes in the way that scientists and extension staff work with farmers. Taking a more integrated approach also has cost implications and it needs to be demonstrated that the benefits outweigh any additional costs.

WHAT NEXT?

This study has highlighted the need for new communication tools that can help to improve farmers' knowledge and aid their decision making in such things as assessing trade offs between rice and vegetable production, use of land for cropping or fish farming and whether or not to invest labour in a particular soil management practice such as compost application.

A clear need was identified for more innovative approaches and tools for enabling information exchange centred around ICM. Under a new project, some communication tools and processes are being developed and tested in collaboration with farmers and some key service providers in extension and research. An additional asset is that NRSP has links with a regional agricultural research network which can ensure that the findings are regularly communicated in South Asia by the project's own local partners.

R7600 An assessment of strategies for integrated crop management

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Knowledge does not wear out

Knowledge might not wear out, but it can often be difficult to find and make good use of it. It is a sad fact that too much useful information is discarded or is 'lost' when people retire or move jobs. Many organisations try to keep copies of valuable papers and reports in their libraries but a lack of resources often means that they are unable to do this properly. The result is that organisational 'memory' is often short - just about as long as current staff have been employed. If new staff do not know that information exists how do they begin to find it and make use of it? If they do find it, how can they assemble it in some sensible order so that it becomes a useful tool and not just an administrative burden? Current trends towards more rapid changes in organisational structures and in staff turnover just exacerbate this situation. This does not bode well for those wishing to build on past knowledge and experience when making plans for the future.

IN THE CARIBBEAN

Communities in the Caribbean are seeking ways to make existing knowledge available and useful. Although just the mention of the Caribbean is enough to conjure up images of a tourist heaven of sun, sea and luxury, the view is very different for those people who must make their livelihoods there and seek new opportunities among the fragile natural resources of the coastal zone.

The first task was to bring together in a systematic way what was already known about the Caribbean coastal zone and its populace.

The next step was to see how this might benefit future planning by helping to identify constraints to developing new livelihood opportunities and areas where more research might be of benefit.

Knowledge might not wear out, but it can often be difficult to find and make good use of it

A great deal has been written and published about the Caribbean coastal zone but it is scattered across the region. Searches were made of electronic databases both from the wider Caribbean and worldwide to try and locate as much relevant material as possible. The challenge was where to draw the line and yet be sure that all the important references had been located. In practice there was no simple answer to this. However, time limitations helped to draw the line, and it was reasoned that once the main database was set up there would always be the opportunity to add that important report which had been missed in the early searches.

LEVELS OF CAPITAL

To turn the data into useful information and then make it accessible needed a good classification system. An extension of DFID's

concept of 'levels of capital' was used for this purpose and a set of six strata was developed representing different levels of natural, human and social processes in the coastal zone. These strata were:

- Natural resource base – the natural resources available for harvesting or utilisation
- Extracted resource – sand may be seen as a potential resource, but only when it comes off the beach is it an extracted resource
- Activities – the extraction methods used
- Nature of the individual – the human resource
- Informal or localised groupings of family or community – e.g. NGOs, church groups
- Formal institutional relationships – Government and international groups

In addition to the six strata, 12 key questions were also developed to provide a means of further categorising the information. In this way it was possible, for example, to say that 500 references had been located dealing with natural resources, but only 25 were concerned with livelihood activities. The outcome might then be that more research work was needed on livelihood activities and less on natural resources. In practice, questions 1 and 2 relating to the natural resource base proved to be the area most researched, along with questions 10, 11 and 12 relating to social capital.

In all, more than 12,000 references were located and assembled into a researchable database. 1,000 references with a strong relevance to livelihood strategies and natural resource management were then selected and a sample of 100 was reviewed in detail.

A series of regionally applicable indicators for particular facets of island or national livelihoods was also developed. Some of these were derived from information directly available from the databases and some were obtained by creating complex indices through mapping one against another. One of these, for example, characterised the potential pressure on the coastal resources by mapping the length of coastline per individual.

VALIDATING THE FINDINGS

Searching and finding a gap in the literature is one thing, but does it mean that more research is needed or simply that the topic is not important? To test this, views were sought both at a regional level and at a local grassroots level. To assess the regional picture a group of senior Caribbean representatives was brought together 'electronically' and asked to list major coastal issues and rank them according to regional, national and local importance. Grassroots opinion was sought from two communities based on islands where the project partners operated. One was a community in Portland Bight in southern Jamaica (a 'large' island) and the second was the entire community of Tobago, a much smaller island. A questionnaire was developed with the help of the project partners and 80 local community representatives were asked about their views on the future of the coastal zone and its resources. The results were validated at workshops attended by representatives of the communities. In broad terms they showed that the people of Portland Bight were not well off or very optimistic about their future. In contrast, those from Tobago had more assets

and, although they were concerned about uncontrolled development, they felt more empowered to influence local decisions.

A comparison between the regional views and those from the grassroots, perhaps not surprisingly, showed that the perceptions of need were not the same. Some issues of high local importance scarcely featured on national or regional rankings.

A 2-day regional workshop in Barbados was used as the vehicle to present findings from the data searches and the analysis of community responses and to suggest future researchable constraints to planners and to potential donors. The prototype database was well received, and several interested regional groups made suggestions for ensuring its sustainability.

The recommendations made for future research work in the natural resources area included:

- Consideration of a blend of regional, national and local projects
- More holistic approaches to research, and less concentration solely on natural resource issues
- More emphasis on the human resource base in relation to natural resources
- Carrying capacity studies on both systems and thematic issues
- Social and economic inclusion of coastal communities in research
- Development of more appropriate coastal poverty indicators
- Attention to scalability

R7797 Opportunities and constraints for coastal livelihoods in the Caribbean

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Can grassroots influence policy?

Reducing poverty and preserving natural resources for use by future generations are among the principal aims declared by many state governments in semi-arid areas of India. Yet it is paradoxical that many of the programmes implemented to achieve these aims have unintentionally been responsible for undermining them.

COMMON POOL RESOURCES

The poor and disadvantaged have traditionally relied upon natural resources such as forests, commuity pastures and ponds as an invaluable source of sustenance and income for household survival, opportunities for risk sharing and coping with seasonal crises or shocks such as sickness and drought. Most are landless and so do not own resources in the normal sense of the word but they use them in an apparently unregulated fashion commonly described as open access, which means there is no effective owner or secured rights. The resources they use are often called *Common Pool Resources* (CPRs) and include village pastures, threshing grounds, waste dumping sites, firewood collection areas, sites for religious functions and burial grounds. Farmers' fields can also be very important seasonal CPRs to which others have customary rights to graze their animals during the postharvest period.

It is unfortunate that many of the current state development policies aimed principally at improving the management of natural resources have actually led to a significant reduction in CPRs and this in turn has tended to further marginalise the poor and disadvantaged. The introduction of large-scale privatisation of

It is paradoxical that many development programmes designed to help the poor have unintentionally had the opposite effect

common grazing lands and their enclosure by forest and watershed management projects, for example, has resulted in a dramatic reduction in common grazing land and many landless people have had to sell their livestock as a result. New local governments and electoral politics have also exacerbated the problem by breaking down the old feudal management systems, which were largely responsible for their stability and proper maintenance. At the same time, many of the new large-scale development initiatives have given rise to other forms of common property that require new and appropriate management regimes for their sustained and equitable use.

Innovative ways of managing existing and new CPRs are needed to ensure that the poor and landless engage more fully at the grassroots level. But equally important is the need to find ways in which these grassroots issues can be fed back into the formulation of state policies so that account can be taken of the importance of CPRs and the

New ways of managing CPRs are needed to ensure that the poor and landless engage fully at the grassroots

complex local political issues that surround them. Planners too can then begin to appreciate the dependence of poor communities on them.

The Natural Resources Institute in UK in association with the Central Research Institute for Dryland Agriculture, Hyderabad and two Indian NGOs have been investigating these issues with the aim of understanding the current status, trends, dynamics, livelihood contributions and management systems of CPRs in India.

This has led to a number of important findings and the identification of key researchable issues that would enable new management strategies to be introduced and tested.

IN ANDHRA PRADESH AND GUJARAT

Andhra Pradesh and Gujarat were the states chosen for the study. They contain vast semi-arid areas where CPRs have made a significant contribution to most people's livelihoods but have been severely degraded in recent years. A review of existing literature and data was complemented with stakeholder consultations undertaken by two local NGOs who examined case studies of both successful and unsuccessful CPR management systems in these states.

The problems

In both states, policies have encouraged the privatisation of land based CPRs. In Andhra Pradesh land reforms have meant that common land was converted into private land and a blind eye was often turned to privatisation through encroachment. Privatisation of CPRs is often justified on the grounds of increasing productivity and efficiency but this ignores the issue of equity. Productivity and efficiency are important but how to build in equity and sustainability is a crucial question.

A major issue was the rapid expansion in the use of groundwater for irrigation. Over-exploitation of this source of water, fuelled by subsidies, has meant that only the wealthier farmers are able to afford the technology to pump the deeper water. Those relying on surface pumps are literally left high and dry. Excessive pumping has also led to seasonal drinking water shortages and saline intrusion in coastal aquifers.

Where formal attempts were made to set up community management systems they have not always met with success. In some cases they have led to the direct exclusion of stakeholders. A newly created Water User Association, for example, only recognised command area farmers as members. Other users of water such as fisherfolk, washers and cattle herders were excluded by law. Women too were excluded because membership was conditional upon having land titles.

An evaluation of a watershed development programme in Andhra Pradesh showed that stakeholders in 17 out of 27 watersheds had not been organised into groups. Where groups were formed, their roles and responsibilities were not always clear and they were liable to become defunct within a few years unless they were soundly constituted, and carefully nurtured in the initial stages.

Conflict within CPR management groups, and between those groups and neighbouring villages and hamlets was common, and tended to undermine management initiatives. The rigid nature of some development agency interventions did not help to resolve such conflicts, nor did the lack of a coherent policy

framework on CPRs among government departments that tended to deal with them in different ways. Some insist on uniformity, such as single village management units as opposed to multi-village or other arrangements when it is clear that this approach is inconsistent with the diverse social arrangements and relationships that exist in rural India.

Investment in CPRs

Significant investment will be needed to rehabilitate CPRs and increase their productivity. But there are those who argue that the costs of rehabilitation are just too high and in any case they are no longer relevant as they do not contribute to people's livelihoods as they did in the past. Evidence also suggests that communities are not good at managing them. These are broad generalisations, which may have relevance in some areas, but there is evidence that such criticisms do not apply to all CPRs and that they should be assessed on a case-by-case, area-by-area basis.

The economic decision is a difficult one as there is a major gap in knowledge of the costs and benefits of rehabilitating CPRs as well as the costs of their community management. Where there are clear and secure returns, or where the operating and maintenance costs are low, people have shown they are prepared to make the investment. Fishing communities in parts of Andhra Pradesh contribute in cash and kind to maintain tanks and villagers in Gujarat voluntarily protect village pasturelands and repair the boundary wall each year. Policy makers and planners need to have a sound basis for prioritising investments, and research can contribute here, to develop ways to assist the process of prioritisation. The prospects for sustainability of people's livelihoods will be an important part of this research as will a thorough understanding of the complex range of factors that influence it.

Managing CPRs

At the grassroots level Panchayats are the elected village councils and they tend to be dominated by the elite. Many people argue that they are the most appropriate body to take on the management of CPRs but the study team did not find any examples of this. The

alternative is management by newly created community-based organisations (CBOs) but recognising that they are likely to include or even comprise the socially and economically deprived sections of society, they will need significant support in the early years. Priority should be given to villages where the prospects for avoiding conflicts or for managing them effectively are good. Criteria include villages with a homogeneous community, small in size and remote, with few or no political or factional conflicts and where their claim to the

resource is relatively undisputed by other villages or communities. In Anantapur District rural communities have evolved very effective arrangements for using irrigation tanks without hurting anyone's interests. One way forward is to learn from past and current situations. It is possible to compare and contrast different community management systems in similar socio-economic and agro-ecological conditions. Finding out the reasons why similar circumstances can produce a variety of approaches, some of which are successful and some not, would provide a valuable source of information for those planning new interventions.

Changing policies

At the state level the scaling up of effective participatory approaches to CPR management will undoubtedly require policy changes together with changes in the formulation of procedures and programmes. A re-examination of policies that encourage privatisation of CPRs is needed as well a better understanding of those aspects of policy that oppose or encourage encroachment. Clear guiding principles, operational mechanisms and administrative instruments will also be required to bring such changes into effect at the grassroots.

The livelihoods approach as promoted by DFID also offers an opportunity to work in a more integrated way rather than focusing on a single issue. Importantly, despite widespread problems there are success stories in managing CPRs and understanding the conditions and characteristics that have led to their success can provide insights into the requirements for their sustainable and equitable management. The changing nature of local politics and attempts to modify power relations in India has also provided new opportunities for new alliances and organisations to develop new ways of tackling old conflicts.

Some success

The project's research has clearly shown that effective management regimes do exist. This is in contrast to the commonly perceived picture of irreversible declines in capacity to manage CPRs for the common good. The urgent next step must be to communicate this to policy makers and other key players, such as donors, so that lessons learnt can be translated into policy initiatives.

R7877 Common pool resources in semi-arid India; dynamics, management and livelihood contribution

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Droughts - just poor rainwater management?

'We must do away with the notion that droughts we face from time to time in many parts of the country are caused by shortage of rainfall. With a good programme of harvesting rainwater we can avoid droughts even in times or places considered to have low rainfall' - *Hansard Records, Tanzanian Parliament, June 18th, 2001*

Can better rainwater management help to reduce the impact of droughts in semi-arid regions? It is well known that only a small fraction of the rainfall reaches and remains in the soil long enough to be useful to crops while up to 70 percent can be lost as it runs off the fields. So it is often argued that poor crop yields and crop failures are not so much the result of low rainfall but of too much wastage of valuable rainwater. Interestingly, no one doubts the critical importance of rainfall but, over the years, few policy makers have recognised the importance of runoff. It is often seen as the cause of soil erosion and so as a hazard rather than a useful resource. But in Tanzania, farmers are showing that managing rainfall by harvesting it can make more water available for their crops and produce significant increases in crop yields and farm incomes.

RAINWATER HARVESTING IS...

Rainwater harvesting is about collecting rainwater and making better use of it. It may be collecting it just where it falls around individual plants or collecting it from a large catchment area and channelling the runoff so that it increases the water available in a smaller growing area. There are micro-catchment systems, which are modest in size, where water is collected from land adjacent to the farm and channelled directly on to the fields. But there are also macro-catchment systems with large water collecting areas, often some considerable distance from the farming areas, which can serve many farms.

CHANGING PERCEPTIONS

In Tanzania, farmers have for some time recognised and exploited the natural concentration of rainwater in valley bottoms and local depressions, yet the overriding perception, which has often driven government policy is that runoff is a hazard rather than a resource and gives rise to concerns about soil erosion. But this perception is now changing, primarily as a result of the research undertaken since 1992 by Sokoine University of Agriculture in Tanzania and University of Newcastle in UK on the management of rainwater to improve maize yields in the semi-arid areas of the country. This is now receiving attention at the very highest levels of policy making. During the recent marathon budget session of the Tanzanian parliament, the first Member of Parliament to stand up and debate the budget speech spoke of the importance of rainwater harvesting. This was the beginning of

many questions and comments by MPs. One suggested that 'rainwater harvesting should be the starting point in our agriculture strategy because without an adequate supply of water, even if we provide credit, mechanisation and extension, there will be no development in agriculture.' (Hansard Records, Tanzanian Parliament, June 18th, 2001)

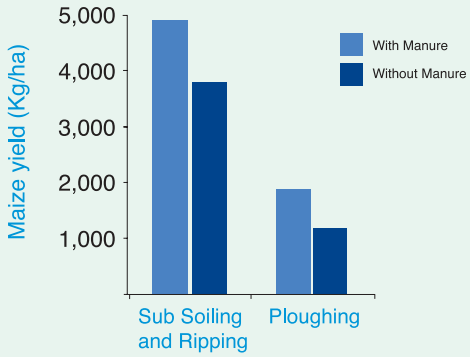
At the beginning of the research programme, work on the technical aspects of rainwater harvesting demonstrated the benefits of this approach to farming. More recent work has helped not only to raise the profile of rainwater harvesting among policy makers but also to provide farmers with the technical knowledge and the skills they need to put the new systems into practice.

WHAT FARMERS ARE DOING

In order to encourage farmers to take up new technologies it is important to understand what they are already doing. A survey of farmers in the semi-arid areas of the country found that more than 70 percent already practice some form of

The government will strengthen and promote the use of rainwater harvesting technology, in both urban and rural areas - *Prime Minister of Tanzania*

rainwater harvesting. More than 55 percent were using the most cost-effective method of simply capturing rainwater where it falls and storing it in the crop's root zone. By ripping the soil at depth, rather than just surface ploughing, and by adding manure, the water retaining capacity of the soil can be significantly increased. Runoff is reduced and water percolates deep into the soil where it is stored and is available for uptake



by plants. This approach has greatly improved maize yields and increased productivity of water from 1.5 to 4.0 kg/ha/mm of rainwater.

Some farmers were using macro-catchment systems to capture runoff from large areas often some distance from their farms. This approach, known locally as *majaluba*, was introduced by Indian immigrants in the 1920s to improve the yields of rainfed rice. It is now gaining popularity among maize growers who prefer this large-scale approach in spite of the complexities of managing sudden large flows and distributing it to large groups of farmers.

Farmers were also quite innovative in exploiting runoff from unusual sources. One example is the practice of using water that concentrates alongside roads and railways. Drainage works, constructed to remove surface water from roads, were installed on the principle of 'save the road and let it flow'. Little thought was given to the water after it left the road and it often eroded huge gullies downstream. A survey along 160 km of road showed that over 65 percent of the drainage works were concentrating runoff and at many sites farmers were exploiting this resource. They had worked together to construct crude diversion systems to channel the water into their farms. In one village alone some 700 ha were being watered in this way with a reported increase in maize yield of 2.5 t/ha, an increase

in gross margin of $220/ha; an increase in return to labour of $5/person day and a benefit cost ratio of 1.55.

The survey also showed that some farmers had introduced more conventional water storage into their water harvesting systems and were using less wasteful water application methods. In one area farmers are storing harvested water in small ponds and scheduling the water applications to grow onions. The result is a high gross margin of US$2,750/ha and a return to labour of over US$13/person day.

SPREADING THE WORD

Disseminating information to both policy makers and to farmers is the main objective of the current phase of research. A special issue of the Tanzania Journal of Agricultural Sciences was recently devoted to rainwater harvesting and a planning guide handbook on rainwater harvesting was produced. Both were widely distributed throughout Tanzania and have played an important role in raising awareness among policy makers. Training programmes were also organised for government extension staff and NGOs who work directly with farmer groups.

In the parliamentary debate the Prime Minister of Tanzania said 'starting the 2001-02 financial year, the government will strengthen and promote the use of rainwater harvesting technology, in both urban and rural areas.' The minister responsible for water development elaborated on this by saying 'in order to ensure that rainwater harvesting is widely used in rural areas, my ministry will work with District Councils to ensure that it is included in development plans of the councils.'

On the farms the commitments of government are beginning to show. The training of trainers programme has so far reached some 224 people in 42 districts. New agricultural programmes being developed by districts now include rainwater harvesting.

The change in attitudes has been nothing short of remarkable. There is now a real demand for the technology. But more work remains to be done. There are some who are voicing concerns about how this innovation might seriously divide rural communities and they advocate an examination of the social institutions to ensure that the benefits of rainwater harvesting are available for everyone and not just a few.

At farm level, research is needed to improve the productivity of water. At the river basin level, the success of many small schemes can lead to large-scale water management problems that give rise to some environmental concerns. It is timely to seek ways of managing these wider issues in order to ensure equity and environmental stability.

R7888 Promotion of rainwater harvesting systems in Tanzania

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Living with wildlife

Farmers and pastoralists living alongside wildlife close to the national parks of Kenya have few advantages. It can also be inconvenient and dangerous. Crops are routinely trampled or eaten and livestock is killed by lions or weakened by exposure to tsetse flies. Tourism revenues are usually promised to compensate for this but how realistic is this option particularly for the poorer communities?

FORTRESS CONSERVATION

For the past 40 years the main approach to wildlife conservation in Kenya as elsewhere has been the creation of national parks and other protected areas to conserve the declining numbers of wildlife species. Unfortunately this approach has not worked as well as was anticipated and the numbers of species that attract tourists such as elephants, giraffes and lions, have continued to decline both within and outside these designated areas.

One principal cause for this was traced to the deliberate exclusion of small farmers and pastoralists from these grassland ecosystems. Many local people did not agree with this approach and so not only did they withdraw their support for the conservation initiative some went further and saw wildlife as legitimate quarry for poaching and a threat to be eliminated. In 1998 a Maasai tribesman was gored to death by an elephant and so fellow Maasai speared a Cape buffalo in plain view of tourists. They then went on to spear a number of elephants.

COMMUNITY CONSERVATION

The failure of 'fortress conservation' as it became known, gave rise to an alternative approach known as community wildlife conservation. Rather than separating wildlife conservation and sustainable community development, it brings them together and uses participation as the new driving force to give local communities a greater opportunity to voice their preferences, needs and concerns about conservation initiatives. This idea gained momentum when research showed that climatic variability and drought were in fact the main constraints on rangeland productivity and not stocking rates and grazing pressures, which were originally thought to be damaging rangeland and wildlife resources.

Crops are routinely trampled or eaten and livestock is killed by lions

The emphasis on 'community' has spawned a broad spectrum of community wildlife conservation approaches and programmes. In general, they all subscribe to the basic idea that conservation goals will only be achieved if local people receive alternative benefits to compensate for their reduced access to natural resources. In other words, 'conservation as sustainable exploitation'

Tourism is an option

One option is tourism and this has been very much the focus of attention among conservation and development professionals and donors. The potential revenues from hunting and viewing wildlife are high and in 1994 tourism accounted for more than 40 per

cent of Kenya's GDP. Redistributing this back to local communities, either directly to individuals through employment or via community livelihood initiatives could create a motor for sustainable development and local people might see the value in conserving wildlife. But such strategies have their limitations. One is the fickle nature of tourism. Kenya suffered a 60 per cent fall in tourism revenues in 1997 and 1998 because of the country's elections and the unfavourable press reports. Added to this are concerns about unequal distribution of revenues, employment being low-skilled, limited participation and control remaining with outsiders, and so achieving the desired outcome may be more complicated than was first thought.

Conservation goals will only be achieved if local people receive alternative benefits for their reduced access to natural resources

Surprisingly, very few people have questioned just what community conservation means in practice or whether projects can succeed in meeting their complex and potentially conflicting objectives of wildlife conservation and local development. To date studies have provided optimistic descriptions of local level 'success' but more in-depth analyses are now emerging that indicate otherwise. It appears that many projects are neither sufficiently effective at promoting conservation, nor at encouraging development. Local impoverishment seemingly continues apace in many pastoral areas.

A STUDY OF TWO COMMUNITIES

A study undertaken by ITDG of two communities in southeast Kenya where the potential for tourism is low, examined the impact of wildlife conservation policies on livelihoods and natural resource management. One was located close to Amboseli National Park and the second was near Tsavo National Park.

The study found that, in both cases, wildlife conservation has neither strengthened the livelihoods of the local pastoralists and farmers, nor significantly conserved wildlife. Disappointingly, in spite of the potential benefits, the reality was that people's food security and income were eroded especially in times of stress.

As a result of these experiences local people had a negative view of the effects of wildlife on their livelihoods. Emerging wildlife conservation projects may change this attitude as people begin to recognise that wildlife can have an economic value but in the meantime illegal hunting continues. It was also evident that many people lack the negotiation and leadership skills to present their case properly. Local institutional capacity, which could represent their interests to government and private sector organisations, was also limited.

From a conservation perspective, employees of the Kenya Wildlife Service have quite a different view of the 'problem' of living with wildlife and have found it difficult to successfully combine policies for wildlife conservation with local development. These constraints are all likely to erode any relationship they may have with local people.

Helping people to move forward

To investigate the potential for ecotourism in the two communities, consultations and workshops were hosted by ITDG East Africa at both national and local levels to bring together local people with organisations working in the tourism industry. An 8-day exposure tour was also organised for community members so that they could see at first hand how other communities had tackled similar problems.

As a result of the consultations and tour, people felt better able as a community to address issues that affect their lives and to choose from different natural resources management and ecotourism options.

Productive meetings were held with the Kenya Wildlife Service and at the Tsavo West National Park the assistant game warden was assigned to work with the local community. This is a significant step forward in the light of their very different views and the mistrust that existed between them.

Although some people were still sceptical about ecotourism initiatives, this participative process was seen as beneficial. A majority of the people in the communities now acknowledge that, if carefully planned, ecotourism can provide a way of reducing the current conflicts between people and wildlife. One community identified technologies such as fodder production, salt lick blocks and bee keeping for honey sales that could support ecotourism development and increase community livelihoods.

THE WIDER ISSUE

The study has clearly indicated that if wildlife conservation projects are to succeed then it will be important to concentrate on areas where the potential for cash income generation from

wildlife is high and where interventions are properly tailored to the real needs on the ground. It will be essential that local people participate fully in community wildlife conservation interventions. Building adequate institutional capacity and networking among relevant institutions are important steps in achieving this. At government level the need is for stronger inter-sectoral policy coordination for wildlife conservation with tourism and pastoral and farming development. The year 2002 is designated 'World Ecotourism Year' and it is planned to use this opportunity to communicate and promote the study's findings more widely.

R7150 A synthesis of two case studies of common property resource management where tourism, wildlife and pastoralism interact in Kenya

PD099 Towards ecotourism development in Southern Kenya

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Living with wildlife

Stuart Coupe, Viv Lewis, Zadoc Ogutu and Cathy Watson – Available from ITDG Publishing Price £12.95

Two cities - one problem

Two cities, Kumasi in Ghana and Hubli-Dharwad in India. They are different in almost every way and yet they both face the same problem – relentless growth.

Everyone in the developing world knows that there is wealth in the cities and Kumasi and Hubli-Dharwad are no exception. The result has been the relentless urban drift over the past 30 years and more. Currently, about half the world's population lives in or around metropolitan areas and by 2005 some 60 per cent of people will live in cities. But can cities continue to absorb people as they currently do and what problems does this create?

One third of the world's city population live in the peri-urban interface

As the activities of urban areas come into contact with those of their rural surroundings, an interface is created with distinct features that affect natural resources and the livelihoods of those who depend on them. As many as one third of the world's city population live in this zone, known as the 'peri-urban interface'. Change is the main feature of this interface. Livelihoods cease to be entirely based on rural activities and begin to incorporate opportunities for non-farm income sources. Farmlands, grazing areas, and forests are managed differently to supply urban markets for building land, for foods and for energy, while pollution and wastes and labour demands in the city alter the workings of rural life. Although this is a source of gain for some it can also be a threat to others by bringing greater poverty to those who were once beyond the reach of the city.

Since 1996 a series of NRSP funded research projects has examined the effects of the growth of Kumasi and Hubli-Dharwad on the natural resource production systems. The initial aim was to improve production in the face of urban pressures but this was redirected to aim at improving the livelihoods of the poor through better management of natural resources. The effects of urbanisation on the control and access to those resources became a focus. The impact on agriculture was a key issue and linked to this was the potential for using organic wastes to improve soil fertility.

This publication consolidates the knowledge gained about peri-urban production systems. It examines ways in which production is affected by peri-urban driven changes; which stakeholders are affected and how, particularly the poorer people; and the extent to which municipal and district authorities take peri-urban processes into account when planning development strategies and what options exist for interventions in peri-urban systems.

The peri-urban interface: a tale of two cities. Brook, R.M. and Dávila J.D. (eds.). 2000.

School of Agricultural and Forestry Sciences University of Wales and Development Planning Unit, University College London. 251 + vii pp.

Copies are available free of charge from NRSP – see back cover for contact details.

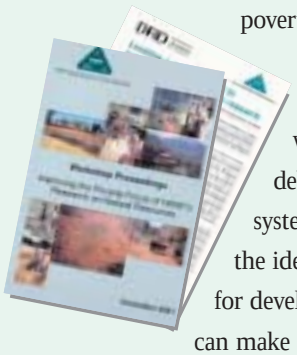
Improving the poverty focus of natural resources research

Can the scientific community help to make a difference in the lives of the rural poor who depend on natural resources for their livelihoods?

This is the major challenge that has faced the Natural Resources Systems Programme (NRSP), since the White Paper on International Development (1997) redirected and sharpened the UK Department for International Development (DFID)'s focus on poverty reduction and sustainable ways for people to build their livelihoods and climb out of poverty.

It is estimated that 60 percent of the world's poor will still live in rural areas in 2020 and the great majority will still be found in poor countries. Poverty is usually defined in terms of small incomes and weak assets. But it is also associated with low expectation of life at birth, high infant and child mortality, high exposure to disease and HIV/AIDS, vulnerability to shocks from natural disasters and economic downturns and conflicts.

NRSP's early focus followed a traditional path of technical projects that identified constraints affecting productivity (e.g. poor soils, water scarcity, inefficient farming practices) and applied science to developing solutions to those constraints. For various reasons these solutions were not taken up on the scale envisaged. In view of the need to respond to DFID's revised policy objectives, NRSP invited some of those responsible for implementation of commissioned research to report and discuss how to sharpen the poverty focus of NRSP's research. This took place at a workshop in November 2000. Experiences in recently completed projects were reported and, through working group discussions, researchers challenged themselves in regard to 'what needs to change?' in how research is designed and implemented. The workshop's proceedings record how research scientists recognised that inter-disciplinary working, linking research with development practitioners at an early stage of its implementation, participatory modes for conducting research and a better understanding of livelihood interactions and dynamics were important requirements for meeting poverty and livelihood objectives.



A background discussion paper on poverty and natural resources systems research was produced for the workshop. The central debate of the paper is how a systems approach can enable the identification of entry points for development interventions that can make a difference in the lives of poor people. The main elements of a systems approach are described and debated, and the ways in which these elements translate in terms of requirements in research design and positioning for achieving a contribution to poverty-focused rural development are proposed.

Locating a Poverty Focus in Natural Resources Systems Research. DFID-Natural Resources Systems Programme (DFID), 2001 12pp

Improving the Poverty Focus of NRSP's Research on the Management of Natural Resources, 2001 Proceedings of an NRSP Workshop held at Institute of Arable Crops Research, Rothamsted, Harpenden, UK, 29-30 November 2000.

Copies are available free of charge from NRSP – see back cover for contact details.

LIST OF NRSP PROJECTS

Forest Agriculture Interface (FAI)

Output 1 - *Planning strategies to sustain livelihoods of poor people dependent on forests adjacent to croplands developed and promoted*

R7514 Development of process and indicators for forest management, Nepal
Yam Malla
Agricultural Extension and Rural Development Dept (AERDD) University of Reading, Centre for Natural Resources and Development University of Oxford, NUKCFP
Start date: Jan 2000 End date: Dec 2001

R7889 Community forest research findings in Nepal
Oliver Springate-Baginski
University of Leeds
Start date: Nov 2000 End date: Feb 2001

R7957 Poverty dimensions of public governance and forest management in Ghana
David Brown
Overseas Development Institute, Institute of African Studies Legon Ghana
Start date: Mar 2001 End date: Mar 2002

R7975 Social structure, livelihoods and the management of CPRs in Nepal
Janet Seeley
School of Development Studies University of East Anglia, Tibhuvan University Kathmandu Nepal
Start date: Mar 2001 End date: Mar 2003

Output 2 - *Strategies to secure the livelihoods of poor people dependent on agricultural systems near the receding forest margin developed and promoted*

R6789 Water and soil management
David Jackson
Natural Resources Institute (NRI), Crop Research Institute, Soil Research Institute Ghana Council for Scientific and Industrial Research Ghana, National Agricultural Research Programme Ghana
Start date: Jan 1997 End date: Jul 2000

R7446 Shortened bush fallow rotations for sustainable livelihoods, Ghana
Morag McDonald
University of Wales Bangor, Forestry Research Institute Ghana (FORIG), Ministry of Food and Agriculture (MOFA) Ghana, Ghana Organic Agriculture Network(GOAN), International Institute of Tropical Agriculture (IITA) Nigeria
Start date: Dec 1999 End date: Feb 2003

R7515 Knowledge dissemination domains in the forest agriculture interface
James Sumberg
Overseas Development Group (ODG) University of East Anglia
Start date: Mar 2000 End date: Feb 2002

R7516 Bridging knowledge gaps between soils research and dissemination, Ghana
Fergus Sinclair
University of Wales Bangor, FORIG, GOAN, IITA
Start date: Jan 2000 End date: Jun 2001

R7560 Review of technologies being evaluated for the forest agriculture interface
Robin Matthews
Cranfield University, University of Reading, University of Science and Technology Kumasi Ghana, Nepal Agricultural Research Council
Start date: Feb 2000 End date: Mar 2001

R7577 Environmental policies and livelihoods in the forest margins, Brazil and Ghana
Steve Wiggins
University of Reading, Crops Research Institute Ghana, Programme Poverty and Environment in Amazonia (POEMA), Univeristário do Guamá Brazil
Start date: Mar 2000 End date: Mar 2002

R7870 Policies, institutions and interventions for sustainable land management in Amazonia
Katrina Brown and Marcia Muchagata
ODG University of East Anglia, Centro Agropecuário and IMAZON Belém PA Brazil
Start date: Oct 2000 End date: Feb 2002

High Potential (HP)

Output 1 - *A suite of integrated management strategies offering improved and sustainable benefits to the poor developed and promoted*

(a) Irrigated

R7583 Improved livelihoods - Bihar and Uttar Pradesh
John Gaunt
Institute of Arable Crops Research (IACR) Rothamsted, Silsoe Research Institute (SRI), University of East Anglia, Dept of Water Management Research (DWMR) India, International Water Management Institute (IWMI) Sri Lanka
Start date: Mar 2000 End date: May 2000

R7600 An assessment of strategies for integrated crop management
John Gaunt
IACR Rothamsted, NRI, AERDD University of Reading, PROSHIKA Bangladesh
Start date: Mar 2000 End date: Mar 2001

R7830 Integrated management of land and water resources for enhancing productivity in Bihar and eastern Uttar Pradesh
SR Singh
Directorate of Water Management Research Patna India, IACR Rothamsted, IWMI Sri Lanka
Start date: Oct 2000 End date: Sep 2004

(b) Rainfed

R6759 Integration of aquaculture into the farming systems in the eastern plateau, India
James Muir
Institute of Aquaculture University of Stirling, East India Rainfed Farming Project, Central Institute for Freshwater Aquaculture India
Start date: Nov 1996 End date: Oct 2000

R7056 Nutrient sourcing and soil organic matter dynamics in mixed-species fallows
Georg Cadisch
Imperial College at Wye, Kenya Forestry Research Institute (KEFRI), International Centre for Research on Agroforestry (ICRAF) Kenya
Start date: Dec 1997 End date: Mar 2001

R7962 Linking soil fertility and improved cropping strategies to development interventions
Georg Cadisch
Imperial College at Wye, KEFRI, ICRAF and Maseno Regional Research Centre Kenya
Start date: Mar 2001 End date: Feb 2005

R7839 Improved livelihoods – Bihar and Uttar Pradesh
John Gaunt
IARC, CABI, University of East Anglia, SRI, DWMR, Patna and Catalyst Management Services Bangalore India, IWMI Sri Lanka
Start date: Oct 2000 End date: Sep 2004

Output 2 - *Efficient systems for the provision of rural services to the poor developed and promoted*

R7180 Options for use of power tillers and draught animals for primary cultivation on small farms, Bangladesh
Martin Adam
NRI, Bangladesh Agricultural University Mymensingh
Start date: Jun 1998 End date: Oct 2000

R7323 Participatory crop improvement in high potential production system and salt affected areas of Patiala district of Punjab state, India
Sadhu Singh Malhi
Krishi Vigyan Kendra Patiala, Punjab Agricultural University India, Centre for Arid Zone Studies University of Wales Bangor
Start date: Feb 1999 End date: Jun 2002

Hillsides (HS)

Output 1 - *Improved hillside farming strategies relevant to the needs of marginal farmers developed and promoted*

R7412 Incorporation of local knowledge into soil and water management interventions, which minimise nutrient losses in the middle hills, Nepal
Morag McDonald
University of Wales Bangor, Oxford University, Institute of Terrestrial Ecology (ITE), Royal Geographical Society (RGS), ARSL and LIBIRD Nepal
Start date: Oct 1999 End date: Mar 2003

R7517 Bridging research and development in soil fertility management: Practical approaches and tools for local farmers and professionals in the Ugandan hillsides
John McDonagh
ODG University of East Anglia, National Agricultural Research Organization (NARO) Uganda, Mount Elgon Conservation and Development Project, Dept of Soil Science Makerere University, CIAT/TSBF Uganda
Start date: Feb 2000 End date: Apr 2004

R7536 Biophysical and socio-economic tools for assessing soil fertility
Jim Ellis-Jones
SRI, Cranfield University, University of Reading, Bhaba Tripathi, ARSL, Nepal Agricultural Research Council Nepal
Start date: Jan 2000 End date: Sep 2003

R7584 Community-led tools for enhancing production and conserving resources
David Preston
University of Leeds, Accion Cultural Loyola Tarija, PROMETA Bolivia
Start date: Feb 2000 End date: Jan 2003

R7856 Strengthening social capital for improving policies and decision making in natural resources management
Pascal Sanginga
Africa Highlands Initiative Uganda, NRI
Start date: Dec 2000 End date: Nov 2003

R7865 Scaling up strategies for pilot research experiences – a comparative review
Sabine Guendel
NRI, SRI, Dept of International and Rural Development (IRD), University of Reading, Imperial College at Wye, AGRUCO, Universidad NUR/DPID, Tierra Viva and Fundacion Tierra Bolivia, Helvetas, Intercooperation and ICIMOD Nepal, CIAT Columbia, NARO Kampala Uganda
Start date: Oct 2000 End date: Mar 2001

R7866 Upscaling field level pilot research experiences
Jim Ellis Jones
SRI, University of Reading, University of San Simon Bolivia, Ministry of Agriculture Uganda, Helvetas Nepal
Start date: Oct 2000 End date: Dec 2002

R7958 Linking field level findings with policy and decision making in Nepal
Chris Garforth
IRD University of Reading, LI BIRD and Agricultural Research Station Lumle Nepal
Start date: Mar 2001 End date: Mar 2004

Land Water Interface (LWI)

Output 1 - *Improved resource-use strategies in coastal zone production systems developed and promoted*

R7408 Building consensus amongst stakeholders for management of natural resources at the land-water interface
Katrina Brown
ODG and CSERGE University of East Anglia, Dept of Life Sciences University of West Indies Trinidad, Department of Marine Resources and Fisheries Tobago House of Assembly Tobago
Start date: Jul 1999 End date: Feb 2001

R7559 Improving coastal livelihoods in the Caribbean: institutional and technical options
Yves Renard
Caribbean Natural Resources Institute (CANARI) St Lucia, Institute of Development Studies University of Sussex
Start date: Jan 2000 End date: Mar 2003

R7668 Impact and amelioration of sediment and agro chemical pollution in Caribbean coastal waters
Callum Roberts
University of York, MRAG Ltd, Caribbean Environmental Health Institute and Ministry of Agriculture Fisheries Forestry and the Environment St Lucia, University of West Indies and Caribbean Coastal Area Management Jamaica
Start date: Jun 2000 End date: Jul 2003

R7797 Opportunities and constraints for coastal livelihoods in the Caribbean
Nick Willoughby
NRI, Caribbean Coastal Area Management Foundation Jamaica, Environment Tobago Trinidad and Tobago
Start date: Jul 2000 End date: Jun 2001

R7976 Institutional evaluation of Caribbean MPAs and opportunities for pro poor management
Caroline Garaway and Nicole Kenward
MRAG Ltd, CANARI St Lucia, University of West Indies Barbados
Start date: Mar 2001 End date: Dec 2002

Output 2 - *Improved resource-use strategies in floodplain production systems developed and promoted*

R7868 Maximisation of joint benefits from multiple resource use in Bangladeshi floodplains
Bhavani Shankar and Steve Wiggins
DAFE University of Reading, CLUWRR University of Newcastle, MRAG Ltd, CNRS Bangladesh, Econ One Research Inc Los Angeles USA
Start date: Nov 2000 End date: Mar 2002

Peri-Urban Interface (PUI)

Output 1 - *Natural resources management strategies for peri-urban areas which benefit the poor developed and promoted*

R7330 Peri-urban natural resources management at the watershed level, Ghana
Duncan McGregor
Centre for Developing Areas Research Royal Holloway University of London, Institute of Renewable Natural Resources UST Kumasi Ghana
Start date: Jan 1999 End date: Mar 2002

R7854 Further knowledge of livelihoods affected by urban transition, Kumasi, Ghana
Fiona Nunan
University of Birmingham, School of Agricultural and Forest Sciences (SAFS) University of Wales, University of Nottingham, Cranfield University, NRI, UST and Crop Research Institute Kumasi Ghana
Start date: Sep 2000 End date: Jun 2001

R7867 Filling gaps in knowledge about the peri urban interface around Hubli Dharwad
Robert Brook
SAFS and CAZS University of Wales, International Development Dept (IDD) University of Birmingham, University of Agricultural Sciences, BAIF Development Research Foundation, SDM College of Engineering and Technology and University of Agricultural Sciences Dharwad India
Start date: Oct 2000 End date: Sep 2001

R7872 Renewable natural resource use in livelihoods at the Calcutta peri urban interface
Stuart Bunting
Institute of Aquaculture University of Stirling, Department of Fisheries Government of West Bengal and Institute of Wetland Management and Ecological Design Calcutta India
Start date: Oct 2000 End date: Dec 2002

R7959 Natural resource management action plan development for Hubli Dharwad PUI
Robert Brook
SAFS and CAZS University of Wales, DPU, University College London, IDD University of Birmingham, University of Agricultural Sciences, India Development Service and BAIF Development Research Foundation Dharwad India, Dharwad Best Practices Foundation Bangalore India
Start date: Feb 2001 End date: Mar 2002

Semi-Arid (SA)

Output 1 - *Diverse coping strategies for poor rural households in semi-arid systems developed and promoted*

R7545 Coping strategies of poor households in semi-arid Zimbabwe
Andrew Shepherd
IDD University of Birmingham, Intermediate Technology Development Group (ITDG) UK, ITDG Zimbabwe
Start date: Jan 2000 End date: Mar 2001

R7558 Understanding household coping strategies in semi-arid India
Czech Conroy
NRI, Society for the Promotion of Wastelands Development Gujarat Institute of Development India
Start date: Jan 2000 End date: May 2001

R7805 Understanding household coping strategies in semi arid Tanzania
Mike Morris
NRI, Sokoine University of Agriculture Morogoro Tanzania
Start date: Jul 2000 End date: May 2001

Output 2 - *Strategies for the integrated management of crop and livestock production systems which benefit the poor developed and promoted at the catchment level*

R7304 Micro-catchment management and common property resources, Zimbabwe
Bruce Campbell
Institute of Environmental Studies University of Zimbabwe, Dept of Research and Specialist Services Chiredzi and CARE Zimbabwe, International Centre for Ecology and Hydrology Wallingford
Start date: Dec 1998 End date: Nov 2001

R7537 Demand assessment for technologies for on-farm management of natural resources
Chris Garforth
University of Reading, Dept of Agricultural Economics and Extension University of Zimbabwe, Centre for Sustainable Rural Development Sokoine University of Agriculture Tanzania
Start date: Jan 2000 End date: Sep 2000

R7806 The role of human and social capital in natural resource management in Tanzania
Emmanuel Mbiha
Sokoine University of Agriculture Morogoro Tanzania, NRI
Start date: Sep 2000 End date: May 2001

Output 3 - *Livelihood strategies based on the sustainable use of common pool resources (including wildlife habitat) developed and promoted*

R7857 Review of common pool resource management in Tanzania
Jon Lovett
University of York, Institute of Resource Assessment University of Dar es Salaam and NORCONSULT Tanzania
Start date: Oct 2000 End date: Jun 2001

R7877 Common pool resources in semi arid India – dynamics, management and livelihood contribution
Barbara Adolph
NRI, Central Research Institute for Dryland Agriculture India, Centre for World Solidarity Andra Pradesh and Aga Khan Rural Support Programme Gujarat India
Start date: Nov 2000 End date: Sep 2001

R7888 Promotion of rainwater harvesting systems in Tanzania
Nuhu Hatibu
Sokoine University of Agriculture Morogoro Tanzania, University of Newcastle upon Tyne UK
Start date: Dec 2000 End date: Nov 2001

R7973 Policy implications of CPR knowledge in India, Zimbabwe and Tanzania
Bill Adams
University of Cambridge, Institute of Economic Growth Delhi India, Centre for Applied Social Science University of Zimbabwe, Faculty of Law University of Dar es Salaam Tanzania
Start date: Mar 2001 End date: Mar 2002

R7974 Human and social capital aspects of soil nutrient management, India
Barbara Adolph
NRI, Deccan Development Society Hyderabad, Bharat Agro Industries Foundation, Tiptur and Indira Gandhi Institute of Development Research Mumbai, India
Start date: Mar 2001 End date: Mar 2002

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