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R8501 Common Pool Resources Synthesis Study

FTR Annex A
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Report for:
Department for International Development (DFID)
Natural Resources Systems Programme (NRSP)

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Contents

1. Introduction

Common Pool Resources (CPRs) are central to livelihoods of poor people in a wide range of production systems. Because of their importance to poverty alleviation, DFID has made a major investment in CPR research. This includes investment through RNRRS projects that have provided insights into various aspects of CPR management.

The aims of this study were to synthesise RNRRS research findings on CPRs and poverty reduction and place them in wider context, presenting them in such a way as to generate more effectively communicable and overarching findings than the RNRRS' component projects. Its purpose is to enable DFID (and other relevant agencies) to identify and address gaps in their knowledge on CPRs and poverty reduction, and to incorporate relevant lessons learned from RNRRS projects into their development of policy and projects.

2. Methods and approach

The project's approach centred around seven key steps, namely:

1. Consultation with policy makers, practitioners and project leaders
2. Literature review
3. Development of framework for analysis
4. Review of RNRRS projects
5. Analysis of key issues arising from consultation, project and literature review
6. Distilled analysis around one central theme for uptake promotion within DFID
7. Communication products produced

These are described in more detail below.

Step 1. Consultation with policy makers, practitioners and project leaders

Central to this synthesis study was a consultative approach designed to maximise the potential change attainable through the study. This was aimed at ensuring deliverables that are responsive to the needs of target institutions as perceived *both* by themselves and through the independent analysis of the study team. This consultative approach also ensured that the communication strategy is as effective as possible in promoting uptake of the study's findings. The results of the consultation were therefore used to inform the development of the project's framework for analysis and communication strategy.

The central aim in the inception phase of the project and beyond was to consult as widely as possible with relevant researchers and practitioners to elicit their views on the key contemporary issues in CPR management and their perceptions of any gaps that exist in current DFID approaches to CPR research and policy. Table 1 details the organisations consulted to date. Members of the study team also attended the Development Studies Association's conference on the Research/Practice Interface and the recent IIED seminar on CPR management, both of which provided valuable opportunities for informal consultation with researchers, policy makers and practitioners from a wide range of organisations. These are summarised in Table 1.

Table 1. Organisations consulted

Organisation
Parliamentarians
DFID
ODI
NRI
CGIAR
CGIAR System-wide Program on Collective Action and Property Rights (CAPRi)
International Food Policy Research Institute (IFPRI)
CIFOR
IDS
FAO Land Tenure Service
International Land Coalition (ILC)
Development Planning Unit (DPU UCL)
IIED
Aquaculture and Fish Genetics Research Programme, AFGRP, Stirling
Oxford University
University of Cambridge
Université Mandé Bukari
Addis Ababa University
African Wildlife Foundation
Oxfam
SOS Sahel
Several independent consultants specialising in CPRs

A central part of this consultation involved engagement with the Land Coalition Forum on CPRs (a web-based internet forum organised by the FAO Land Tenure Service, the Collective Action on Property Rights initiative (CAPRi), and the International Land Coalition [ILC]). The main goal of this collaborative study was to better understand the latest developments in common property, and identify lessons on strengthening common tenure regimes where appropriate. The forum has 80 participants from a wide variety of non-governmental and governmental organisations in many different countries.

Individual project leaders of projects with a CPR or potential CPR content were contacted to enable them to provide updates on the information held in the project databases and to contribute to the synthesis study. A total of 53 project leaders were contacted. Of these, 30 replied with information on reports, papers or other outputs and comments on CPR management, 11 did not reply, and 12 had out of date contact information.

Step 2. Literature review

The literature review consisted of two parts. Firstly, a wide range of strategic policy and other documents have been consulted during the consultation. This was considered to be important for ensuring that the framework for analysis and communication strategy were responsive to contemporary policy priorities and able to 'press the right buttons' in terms of ensuring readership and impact. These documents are outlined in Table 2 below.

Table 2. Key documents consulted

Full document reference / URL
UN Millennium Development Goals http://www.un.org/millenniumgoals/
Commission for Africa Report http://www.commissionforafrica.org/english/report/introduction.html
The World Development Report 2001: Attacking Poverty (available at http://www.worldbank.org/)
The Use of Science in UK International Development Policy http://www.publications.parliament.uk/pa/cm200304/cmselect/cmsctech/133/133.pdf
DFID Science and Innovation Strategy Consultation http://www.dfid.gov.uk/consultations/science-main.asp
Johnson, C. (2004), 'Uncommon ground: The 'poverty of history' in common property discourse', *Development and Change* 35(3), 407-433
Agrawal, A. (2001), 'Common property institutions and sustainable governance of resources', *World Development* 29(10), 1649-1672
ODI's (RAPID) Analytical Framework http://www.odi.org.uk/rapid/Publications/Documents/rapid_bp1_web.pdf
DFID report: Bridging the gap http://www.dfid.gov.uk/pubs/files/poverty-bridgegap-guidance.pdf
David Booth (ed.) 2003. Fighting poverty in Africa: are PRSPs making a difference? ODI: London.
Allen, A. (2003), 'Environmental planning and management of the peri-urban interface: perspectives on an emerging field', Environment and Urbanization 15(1), 135-147
Allen, A., Davila, J. and Hofmann, P. (2005), 'Governance and access to water and sanitation in the metropolitan fringe: an overview of five case studies'. Paper presented: 'Urban Governance, diversity and social action in cities of the South', N-Aerus Annual Conference, 15-16 September 2004, Barcelona, Spain. In draft.
Ashley, C. and Elliott, J. (2003) 'Just wildlife or a source of local development?' ODI Natural Resource Perspectives No. 85. Available at www.odi.org/nrp/
Eaton, D. and Hilhorst. (2003), 'Opportunities for managing solid waste flows on the peri-urban interface of Bamako and Ouagadougou', Environment and Urbanization 15(1), 53-63
Ellis, F. and Harris, N. (2004), 'New thinking about urban and rural development', Keynote paper for DFID Sustainable Development Retreat, University of Surry, Guildford, 13 July 2004.
Hofmann, P. (2005), 'Access to water supply and sanitation services (WSS) of low-income households in the PUI of developing countries', London, UK: Development Planning Unit
Insights 41 – Urban Poverty (2003), Leaflet produced by id21 and available at www.id21.org
Living between urban and rural areas – shaping change for improved livelihoods and a better environment. Leaflet produced by the Peri-urban Research Project Team, Development Planning Unit, University College London. Available at http://www.ucl.ac.uk/dpu/pui
Slater, R. and Twyman, C. (2003), 'Hidden livelihoods? Natural resource-dependent livelihoods and urban development policy', ODI Working Paper No. 225, London, UK: Overseas Development Institute
Tacoli, C. (1998), 'Rural-urban interactions: a guide to the literature', Environment and Urbanization 10(1), 147-167
Tacoli, C. (2003), 'The links between urban and rural development', Environment and Urbanization 15(1), 3-12

Secondly, a focused review of academic literature was undertaken around the subjects of poverty, CPRs and common property regimes and evidence of CPR contributions

in India, Nepal and Africa. Summaries of each of these reviews were produced to inform project analysis.

Step 3. Development of framework for analysis

On the basis of the consultation and literature, a framework for analysis was developed which was used to guide the analysis of RNRRS projects. The objective was to create a framework that would focus analysis on the key areas that would most likely be effective in encouraging DFID and other relevant agencies and practitioners to incorporate relevant lessons learned from RNRRS projects into their development of future CPR-relevant policies and projects.

Step 4. Review of RNRRS projects

RNRRS programmes were screened for CPR-relevant projects on the basis of web-based material and correspondence with programme leaders. This included face-to-face discussions and written correspondence. Selected projects were then analysed on the basis of the framework for analysis developed in Step 3.

Step 5. Analysis of key issues arising from consultation, project and literature review

The results of Step 4 were then analysed in the context of the issues raised through Steps 1-3. An important output of Steps 1-3 was the identification of gaps that exist in current CPR knowledge which require addressing in future research and policy initiatives. In Step 5 these could therefore be assessed alongside the analysis of RNRRS projects from Step 4. Step 5 therefore highlighted where RNRRS projects have contributed and where further research and policy action is required.

Step 6. Distilled analysis around one central theme for uptake promotion within DFID

Step 5 highlighted a number of key areas where RNRRS projects had contributed insights and tools of relevance to contemporary concerns around CPR management. In Step 6 a single key issue, namely CPRs and conflict management, was selected to provide a focal point for distilled analysis. The purpose of this was to highlight a central theme which would have a high impact in driving uptake promotion of the study's results within DFID. This Step formed the basis of a short 3,000-word briefing document to be circulated within DFID.

Step 7. Communication outputs produced

The project is producing a total of five different types of communication outputs (see Table 3). These were based on insights obtained during the consultation with practitioners and policy makers during Step 1 and which emphasised the most effective approach to achieving uptake of the study's findings.

Table 3. Communication outputs and corresponding target audience

Communication output	Target Audience
Summary briefing paper for DFID	**Policy makers** in DFID.
Response to DFID's science and innovation strategy consultation	**Policy makers** in the DFID science consultation process.
Response to DFID's White Paper consultation	**Policy makers** in DFID
Select Committee style report aimed at Westminster policy makers	**Policy makers** in Westminster, specifically members of the international development select committee and MPs with an interest in international development.
Academic review papers	**Researchers** through publication in academic journals. E.g. 'Policy Piece' on CPRs accepted for the African Journal of Ecology.
Common Pool Resources: A gateway to insights from DFID's RNRRS	**Practitioners** identified through the NRSP mailing list.

3. Results

Consultation with policy makers, practitioners and project leaders

A brief summary of the issues raised during Step 1 is provided below. To initiate dialogue, two questions were asked at the start of the consultation. 1. What are the key issues in CPR management? 2. What are the gaps in CPR research? The notes below reflect feedback from these questions and points raised in broader discussion.

Undervaluing CPRs

Throughout the consultation it was highlighted that the contribution of CPRs to rural livelihoods is often underestimated. In India, for example, it is estimated that CPRs contribute $5 billion a year to incomes of poor rural households (two-and-a-half times World Bank lending to India in 1996. [Beck and Nesmith, 2001]). The significant value of CPRs to the poor is explored in detail within the literature report later in this report.

DFID's focus on science and technology

Concerns were raised with the fact that the UK government select committee report on science and technology in international development (see Table 2) emphasises a shift towards biotechnology as a 'science' at the expense of insights from the social sciences and elsewhere in the natural sciences. However, the report also emphasises that natural and social science both have roles to play in international development, as do basic, applied and operational research (p. 35). There is therefore a distinct need to understand how DFID-funded research is meeting the criticism received from the House of Commons Select Committee on Science and Technology regarding their perceived lack of technical research. What is the role of science in policy making? Is there a lobby from the biotechnology industry that is influencing central government opinion? The importance of social solutions over technical innovation was the subject of Hardin's classic 'Tragedy of the Commons' paper. The key point Hardin makes in the paper, and which is usually overlooked, is that there are a set of problems with no technical solution. Hardin used the commons as an example of this. This is an area that RNRRS work has much to contribute to, and is addressed explicitly in the paper to be published in the African Journal of Ecology contained in Annex C of this FTR.

Trade and privatisation

The current view seems to be that CPRs have to justify a 'growth' role in poverty reduction, not just a 'safety net' role. This leads to the idea that CPRs should be privatised in order to increase agriculture / livestock output. Poor people are then employed in wage labour and this lifts them out of poverty. There are of course major equity and distributional issues associated with this approach. Land reform programmes in developing counties, such as the Ghana land reforms, have further contributed to the trend in privatisation of previously communal land and a loss of 'customary rights'.

Questions that need to be answered in this area include:

- Has the role of the CPR declined and wage labour become more important?

- How do you add value to CPRs?

- Problems exist in relation to limited asset accumulation and markets of goods and services from CPRs. How can this be addressed?

- What is the impact of the privatisation of certain parts of a CPR, e.g. a bore hole, forest concession or conservation zone? In such instances, where the seasonal mobility of user groups might be disrupted, there is a need for local users to be able to negotiate / defend their rights. Local user groups are, however, often poorly equipped in terms of their capacity to effectively negotiate in such situations. How to strengthen the capacity of local user groups to undertake such negotiations, and how to work with outside interests and the government to better recognise the needs of local user groups then becomes a key issue. This is linked to issues of conflict resolution that are highlighted below.

- How can the sustainability of new uses of natural resources be ensured, rather than moves towards extractive uses geared to short-term economic gain? Here, again, the democratisation of the control over resources and capacity of local users to understand and negotiate new uses becomes an issue.

- How do we manage the transition from CPRs to Private Property Resources (PPRs), or whatever management regime follows the CPR, so that it retains benefits for poor people, i.e. ensuring the process is equitable and inclusive?

- What is the role of the market chain in influencing resource management decisions?

- What are the influences of international processes on the poor and on the environment from a cross-country perspective?

- Peri-urban land has increased in value as cities are growing and becoming more prosperous. When CPRs gain value, they often tend to get privatised. The question is, who has the right to decide whether or not privatisation should occur?

- Are high transaction costs and high risks of doing business based on CPRs further driving the privatisation process? Are perceived transaction costs actually a result of undervaluing CPRs and their associated services?

It was pointed out that there has been some discussion in the World Bank on property rights in Latin America, e.g. http://rru.worldbank.org/Features/DeSoto.aspx. This approach emphasises the importance of codified property rights at the expense of traditional communal rights.

A further interesting point made during the consultation is that all ponds in Bangladesh are now private property, so during the dry season there are no communal fish ponds. A good project for the future could be looking at a way of creating fish CPRs for poor people as they have no natural resources at critical times (note – as highlighted later in this report, this is an area where NRSP has contributed significantly).

Macro-economic trend

Linked to the trend in privatisation of common land is the increasing emphasis by government and donors on macro-economic policy approaches to reducing policy, an approach that may prove ineffective if sustainable common property management regimes are not in place or are becoming eroded. Donors are moving away from project support in favour of direct budgetary support (i.e. debt relief) as this reduces transaction costs (and also neatly shifts any blame of failure to the target countries). The emphasis on macro-economic approaches is further exacerbated via the failure of Poverty Reduction Strategy Papers (PRSPs) to recognise the role of CPRs in poverty reduction.

There is therefore a need to understand the implications of this shift for CPR management and pro-poor policy. This includes a need for further understanding of how to move from poverty alleviation to wealth creation. For example, how do we broaden CPR issues to include global dimensions of trade, environmental services (e.g. broader policy links such as that between coastal CPRs and the Advisory Committee on Protection of the Sea, ACOPS, http://www.acops.org/), carbon trading, climate change mitigation, HIV/AIDS, infrastructural development (markets and roads)? Forging stronger links between CPR systems and PRSP processes is integral to identifying the window of opportunity in terms of focussing more resources on answering these questions.

The research / practice gap

Broad concern was expressed during the consultation that academic research on CPRs may currently be peripheral to the real needs in the field. A real perceived need exists for a direct focus on implementation and practice in CPR management and research that is geared towards delivering empirical analysis of how, why and if CPR management theory actually works in practice.

Linked to this is a need to demonstrate the pre-emptive value of research, e.g. in allowing responses to potential impacts of climate change. Recognition of the role of chance in defining successful research impacts is also lacking, despite this constituting an important, if under-reported element of most practically useful research.

Scaling-up, activation of innovation and capacities also need to be addressed. This is rooted in a broad failure to take up recommendations from CPR research. There is a need to understand why this is the case. Is it, for example, a result of policy failure? A failure on behalf of African nations? Untested and untried technologies? High associated risks? A lack of innovation in CPRs? Low value of resources? A divergence (or parallelism) between social and technical research in natural resource management? All these areas need to be addressed by future research.

Tenure

How to sustain existing tenure arrangements or institute new ones in a manner that maintains socially equitable and environmentally sustainable CPR management is a

key issue that many respondents to the consultation felt is still not being properly addressed in practice. There is a range of complex issues that relate to tenure that still need to be addressed by further research. The issues raised in the consultation are as follows.

Problems often arise when choosing between community-based and individual-centred approaches to natural resource management. Contemporary resource management tends to emphasise the individual, as community or group-based management approaches require an understanding of the dynamics between individuals and the links between these and resulting management strategies. It also requires defining who the community are, with associated problems of defining the 'unit of ownership' in order to transfer to or sustain ownership for the community. This may be further complicated by problems of defining the physical boundaries of a communal resource.

A further complication is that CPRs necessarily imply exclusion. This can be problematic if user groups are not properly understood and able to be defined at the outset. For example, biannual pastoral users might become excluded from deliberations, and as a result legal exclusion might not facilitate the complex traditional patterns of seasonal use of a CPR. Exclusion has also resulted from the sectoral treatment of natural resources by government agencies, which ignores the interlinked nature of most natural resource uses, e.g. woodland and water uses. In this sense, the structure of rights may need to be more dynamic and responsive to issues such as changing seasonal demand.

These problems will vary according to the nature of the resource and the specific situation in question. Negotiation over (as opposed to fixing) rights thus becomes a potentially more appropriate approach to management, and frameworks for facilitating negotiation between groups then become a key issue. In other words, how do we facilitate a move from fixed rights to a system developed around flexible processes?

Economic valuation of CPRs that properly considers the multiple values of all users is an important area that needs developing. This becomes very pertinent when outside interests might wish to exploit a resource in a different way to indigenous users. Proper understanding of who is benefiting from a resource and in what way is essential to negotiating new uses.

These processes are further complicated by the need to define and agree on capacity limits for natural resources, which often requires interactions with technical expertise, designation of authority and deciding on appropriate constraint mechanisms. Access and equity therefore become increasingly prevalent issues as resource capacity becomes more loaded. Linked to this are issues around rule making within communal management regimes and the role of knowledge, sanctions, and their effectiveness in ensuring the success of such regimes.

A lack of proper understanding of appropriate forms of property rights and institutions for land management often results in control over resources being allocated to certain groups, but without clear decision-making rights or control over benefit streams. The interface between the user group holding the title to the CPR and its formal

administration needs to be looked at with a focus on increasing understanding and technical methods for dealing with CPR issues within such administrations.

Related to these issues of defining or negotiating user rights is the issue of transferability of rights, which may lead to potential problems of free-riding. This implies a need to develop methods of getting around this, such as share-holder type approaches.

Within all such processes of negotiating tenure and management of CPRs, there is a need to understand the power relationships that operate within such co-management and similar structures. Linked to this, an interesting and relatively unanswered question is what impact has the politics of new, more participatory/democratic institutions for natural resource management (as promoted by much DFID work including, quite obviously, many NRSP projects) had in terms of influencing/reforming wider local government practices that have, in post colonial times, been characterised by somewhat backhanded/corrupt approaches to governance.

A further issue of concern is whether instituting legal frameworks to address common ownership is enough, as poor people often lack the capacity to uphold their rights.

The distinction between Common Pool and Common Property Resources is also important to consider in the context of tenure. The former implies a resource with multiple user groups, whereas the latter implies legal common property rights. This was a distinction made at a conference held by DFID's sustainable livelihoods group at Southampton University last year, and there is a useful background paper.

An increasingly relevant question that is essential to answer in the context of future climate change predictions is the extent to which CPR management approaches can handle major resource variability.

Conflict resolution

The majority of the concerns highlighted above revolve around understanding conflict dynamics between CPR users and other actors such as state policy makers and donors. It also highlights the requirement for effective negotiation and the resolution of potential conflicts. This is an area that many respondents to the consultation highlighted as having often been missed in CPR research. These include conflicts between CPR user groups (e.g. pastoralist / agriculturalist conflicts), conflicts between commercial and non-commercial CPR uses, and livelihood/environment conflicts. As the analysis in this report will demonstrate, this is an area where the RNRRS has made an important contribution.

Peri-urban interface

The peri-urban interface (PUI) represents a unique area for CPR research and one which respondents felt is currently under-researched, or even not researched at all. Areas of interest raised during the consultation include:

Understanding the transition from CPRs to PPRs (or whatever management regime follows the CPR) in the PUI. The PUI is distinct from other settings because in the PUI this transition is inevitable. There is a need to focus on how to manage this transition so that it retains benefits for poor people, i.e. ensuring the process is equitable and inclusive.

Increased competition and conflict over land and water are typical characteristics of CPRs in the PUI. Land is commodified as urban growth raises land values. Traditional communal management systems break down as land is sold or leased according to market rates. Land values exceed those that can be gained from NR-based production so land uses change. This often leads to NR degradation and pollution. How this resulting degradation can be avoided is an important research priority.

Communal water users at the PUI increasingly come into conflict with newcomers who stake individual claims of ownership over water. Many of these newcomers practice middle-income lifestyles and wish to use water for washing their cars and watering their gardens, etc. Consequently, competition for water increases. The impact of this on poor and marginalised groups and the potential for insights from CPR research to avoid these impacts needs to be understood.

Current state of academic CPR research

The consultation highlighted the centrality of the following papers in defining gaps in existing academic CPR research:

- Agrawal, A. (2001), 'Common property institutions and sustainable governance of resources', World Development 29(10), 1649-1672.

  This summarises where work on institutional economics in this area (e.g. Ostrom, etc.) has reached, and highlights where the gaps are.

- Johnson, C. (2004), 'Uncommon ground: The "poverty of history" in common property discourse', Development and Change 35(3), 407-433.

  Johnson's paper highlights the fact that there is another side to understanding CPR management that institutional economics ignores. This is more justice oriented and deals much more with issues of moral economy and entitlement.

  A key problem, according to Johnson, is that the two different approaches (institutional economics and justice) do not communicate. Bridging the gaps is a key issue.

Potential criteria for selection of relevant RNRRS projects

The consultation also elicited the following points with regard to selection criteria for choosing CPR-relevant RNRRS projects that might contribute to addressing the perceived gaps highlighted above. These included:

- A need for them to provide examples of the importance of continuity of research, i.e. long-term funding leads to centres of excellence.

- A need for them to show capacity building through a long-term interaction.

- A need for them to have sound scientific research (social and/or natural) leading to evidence-based policy.

Key communication issues

Several insightful points were also raised in the consultation with regard to communicating the project's findings. These included:

- Recent changes in DFID, especially decentralisation, mean that mechanisms to convert research into practice are currently very weak. Since the Rural Livelihoods department was disbanded, there is a lack of internal audience for CPR research. The agricultural team may have picked some of this up, as may fisheries and forestry. Peri-urban CPRs are certainly not on the agenda for DFID's Urban and Rural Change Team, who want to hear buzzwords such as 'economic growth', 'governance' and 'drivers of change'. DFID decentralisation implies priorities have to be set at the field office level, both to reflect DFID interests and give the research some likelihood of policy influence.

- The usefulness of ODI's (RAPID) Analytical Framework aimed at translating research into practice - briefing paper available here: http://www.odi.org.uk/rapid/Publications/Documents/rapid_bp1_web.pdf

- A need to communicate to NGOs, as they are key for translating findings into practice.

- Select Committee Report formula favours communication with MPs.

- Aim to exploit links with Commission for Africa report so as to ensure topicality and hence readership.

- Link in with themes emerging from the G8 summit.

- Potential for exploiting the email group that may be established following the IIED CPR seminar aimed at lobbying the de Soto commission over the importance of CPRs.

- Link in with DFID consultation on their science and technology strategy.

- Climate change issues are very topical – potential to link in with International Development Committee (IDC) themes.

- Use of case studies to capture attention.

- Useful organisations / groups include:

Ring alliance – a networking group of international research organisations
http://www.ring-alliance.org/
Global Policy Network – potentially useful information sharing facilities
http://www.globalpolicynetwork.org/
New Directions in Agriculture for Reducing Poverty (web-based discussion group moderated by Cecelia Luttrell and John Farrington)
http://dfid-agriculture-consultation.nri.org/maillists/risk-and-vulnerability/msg00002.html

Moving forward from the consultation

The consultation provided a valuable overview of contemporary views with regards to DFID's approach to CPRs, and highlighted the key areas where gaps currently exist in CPR knowledge as well as the priority areas for future research. By way of summary, while it highlighted useful points with regard to the PUI, the current state of academic CPR research, criteria for project selection and key communication issues, three areas in particular received most emphasis during the consultation. The first area was DFID's approach to science and technology, with concerns raised that DFID's interpretation of science was too narrow and in danger of ignoring the essential need to combine insights from both the natural and social sciences. During this project's analysis of CPR-relevant RNRRS projects, it became clear that the RNRRS supported a range of projects that successfully combined natural and social science approaches to make important contributions to sustainable CPR management. As a result, outputs of this project included responses to DFID's consultations on their Science and Technology Strategy and White Paper on International Development, a White Paper style briefing note for parliamentarians and a policy review for the Journal of African Ecology. As well as highlighting the centrality of CPRs to achieving the MDGs, all these outputs focused on highlighting the need for combining insights from the social and natural sciences in order to address CPR management issues where there may be no specific 'technical' solution available. They also showcased RNRRS examples of best practice where this had been effectively achieved.

The second key issue was the current trend towards privatisation of CPRs and the increased emphasis on macro-economic approaches to poverty alleviation amongst donors and recipient countries. This highlighted the fact that CPRs are now often characterised by conflict between commercial and non-commercial uses. This is another area that was highlighted in the outputs mentioned above. Based on RNRRS projects, the aim was to demonstrate the importance of CPRs to poor people as both a safety net and a pathway out of poverty, and highlight the fact that without sustainable CPR management first being in place, macro-economic approaches are likely to result in further marginalisation of the poor.

The third and final key area raised in the consultation revolved around the issue of tenure. A range of complex CPR management dynamics that remain to be addressed within research and policy were highlighted. Often these issues broadly revolved around resolving conflicts between different CPR user groups and / or conflicts between livelihood and environment management aims. In particular, the majority of points raised on this subject highlighted the need for facilitating effective negotiation to resolve such conflicts and develop socially equitable and environmentally sustainable CPR management regimes.

Conflict resolution techniques were seen as a critical area that had been underplayed in CPR research to date, and they may assist in addressing issues related to both the trend towards privatisation and macro-economic policy approaches, and problems related to negotiating and implementing sustainable tenure agreements. As will be seen later in this report, conflict resolution is a particular area within the field of CPR management where the RNRRS has made a significant contribution. As a result, outputs of this project include a focused briefing note for DFID on CPRs and conflict resolution. The next section of this report details the literature review that was undertaken, then moves on to detail the development of the framework which provided the basis for this project's analysis of RNRRS CPR work.

Literature review

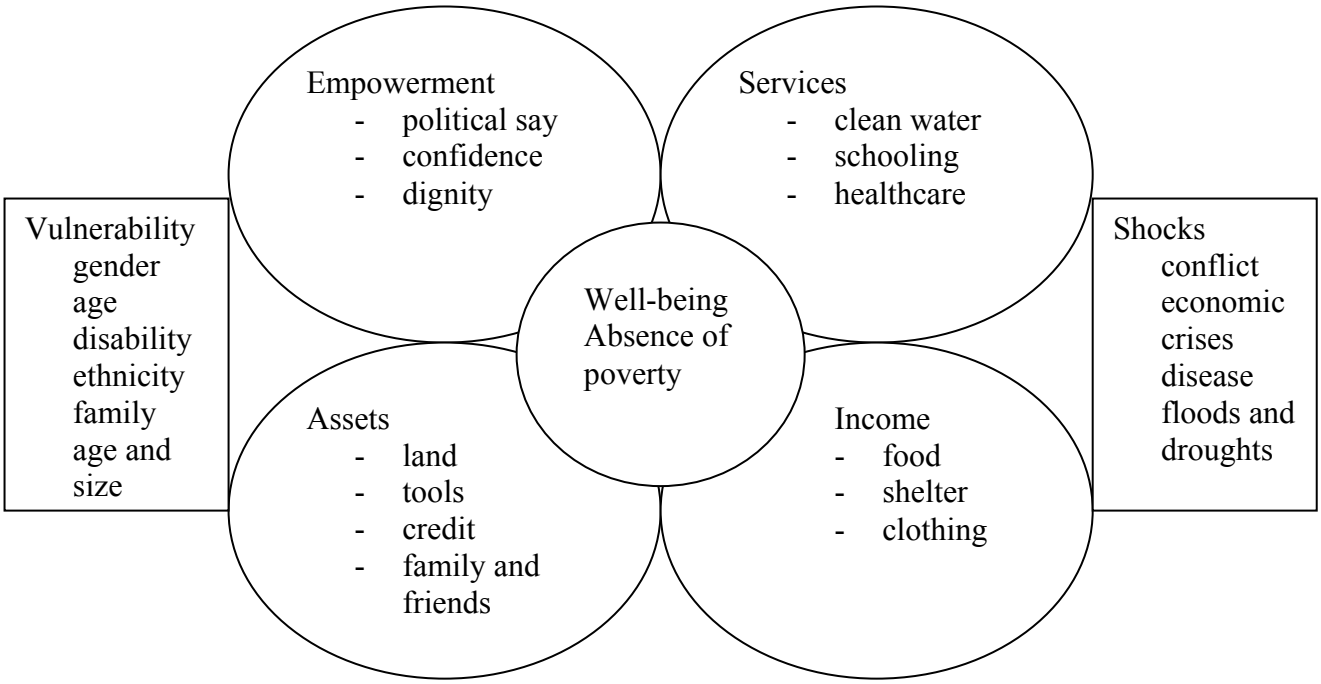
Poverty

Poverty has been thought of, and is still thought of to some extent, as income or consumption below a certain threshold (Lipton, 1997; World Bank, 2000). These quantitative indicators are seen as useful and reliable measures of poverty, since they can be aggregated at national or international scales to allow for comparison of poverty between locations (Maxwell, 1999; van de Ruit and May, 2003). However, the concept of poverty has been broadened by researchers such as Townsend (1970) to incorporate 'basic needs' such as access to services, so that definitions of poverty include the qualitative aspects of a lack of engagement with society. In the development literature, quantitative measures of poverty have been criticised as reductionist, and this conventional approach is seen as overlooking local complexity and the social and institutional context of livelihoods (Baulch, 1996; Chambers, 1997; Ellis and Mdoe, 2003; Maxwell, 1999). Powerlessness and a lack of assets to sustain livelihoods are therefore seen as important elements of poverty. Sen's work on poverty and famines (1981) introduced the ideas of functionings (elements of a person's well-being) and capabilities (combinations of functionings that are achieved) into the research on poverty. Sen's work was also the first to consider that poverty is not necessarily the result of a lack of resources, but the result of inadequate access to and control over resources. In this way poverty and livelihoods become more than just about income; they include the range of resources both natural and social, as well as access to those resources, that are required to function in society (Williams, 1999).

The World Development Report 2001 highlights this shift in thinking. The World Bank now considers social indicators alongside its economic indicators of income or consumption. The new social indicators of poverty are: 1) health and education, 2) vulnerability (itself a composite indicator), and 3) powerlessness (includes qualitative variables such as civil liberties). The three indicators taken together provide a multidimensional framework for examining poverty. The World Bank suggests that it may be possible in the future to produce a welfare function with each variable weighted according to importance, but at the moment the variables are used to examine the various dimensions of poverty.

DFID's approach reflects that of the World Bank. In their 'Bridging the gap' report, DFID takes a 'basic needs' approach to poverty that incorporates not only income, but also health, education and access to basic services such as clean water. This represents an approach that uses both objective (absolute and relative poverty lines) and subjective (perceptions of power, assets, vulnerability) measures of poverty. Social exclusion (powerlessness) and vulnerability are key elements in the DFID approach.

Figure 1. Dimensions of poverty



Source: DFID 2001 'Bridging the gap'

Common Pool Resources and Common Property Regimes
Common Pool Resources are natural or man-made resources available to more than one person, which can be subject to degradation from overuse. In CPRs one person's use of the commons subtracts from its use by others and there is difficulty in excluding access (Cousins, 2000; Dietz *et al.*, 2002; Ostrom, 1990; 2000). Common property regimes are the institutional arrangements for CPR management and are dependent on property rights. 'A property right is an enforceable authority to undertake particular actions in a specific domain' (Commons, 1968). Property rights are socially constructed (Lawrence, 2000), i.e. rights are only effective if they are recognised by the wider community (*de facto* rights) or in law (*de jure* rights). It is important to distinguish between *de facto* and *de jure* rights, since *de facto* rights tend to be only weakly enforced and are often overruled by governments.

Five property rights have been identified with respect to natural resources. These are rights of access, withdrawal, management, exclusion and alienation (Ostrom, 2000; Schlager and Ostrom, 1992). Access rights allow individuals the right to access resources for non-subtractive uses. Withdrawal rights allow individuals to capture resource units from a resource. Management rights allow individuals to make improvements and decisions regarding resource allocation, while exclusion rights allow individuals to decide who should be allowed access, withdrawal or exclusion rights. Finally, alienation rights mean that individuals can sell or transfer their property rights to a resource. The combination in which these property rights are held leads to five types of property rights holders (Ostrom, 2000; Schlager and Ostrom, 1992) (Table 4).

Table 4: Property rights associated with different rights holders
(Source: Schlager and Ostrom, 1992)

	Owner	Proprietor	Claimant	Authorised User	Authorised Entrant
Access	X	X	X	X	X
Withdrawal	X	X	X	X	
Management	X	X	X		
Exclusion	X	X			
Alienation	X				

Property regimes are the result of how property rights are applied to a resource. Open access regimes are the result of a lack of any enforceable property rights over a resource. Instead, ownership is realised on capture of resource units (Ostrom, 2000), as is often the case in fisheries where fish become private property once they are caught. In his seminal paper, Hardin (1968) described how each user of the commons would act to maximise their benefits from the open access commons while the costs of their use were shared between all users. As a result, the commons would be subject to overuse and this would eventually lead to degradation and the collapse of the resource. In contrast, common property regimes are defined by communal ownership of resources by an identifiable group, where members generally have proprietary rights (Ostrom, 2000). In this case, property rights can be vested in villages, co-operatives or clans. These rights cannot be sold but are often passed down through members of a family. When rights and duties are adequately enforced through communal management regimes CPRs are not always subject to open access and degradation (Cousins, 2000; Dietz *et al.*, 2002). The 'tragedy of the commons' argument has often been used in support of changing property rights, especially in rangelands. As a result, land has been privatised or appropriated by the state as a way of creating incentives to manage resources for the long term. State property regimes result when ownership rights are vested in the state. However, if the state is weak and unable to enforce those rights, then resources often become *de facto* open access, common pool or private property. When this happens, holding *de facto* rights to a resource means that there may be uncertainty in tenure over the long-term. As a result, there are fewer incentives to invest or improve the resource. Private property results from all property rights, including the right of alienation, being vested in an individual or organisation. Private property is therefore about the exclusion of others from a resource (Lawrence, 2000). Economists often define private property as the perfect type of property regime because it is complete, secure and transferable. As a result, private property is often seen as the way to overcome open access problems. However, private property regimes can also become *de facto* open access or common property if rights and duties are inadequately enforced.

Evidence for the role of CPRs in poverty alleviation and mitigation
There is a wealth of empirical evidence highlighting the importance of CPRs in the livelihoods of the poor for both poverty alleviation (i.e. offering opportunities for income generation) and mitigation (i.e. enabling poor people to cope with shortfalls and risks). Tables 5 and 6 below provide a brief review of the literature from Asia and Africa respectively.

Table 5. CPR Evidence from India and Nepal

Reference	Evidence
Jodha, 1986: 82 village survey in dry tropical west and south India Dasgupta, 1998: review of the economics of poverty	CPRs contribute between 15 and 23% of poor people's income and contribute to improving village equity. The income from CPRs is higher than that generated through anti-poverty programmes in many areas. Poor households are losing access to CPRs (decline of 26-50% between mid 1950s and 1980s) CPRs may be the only non-human asset that the landless have at their disposal
Jodha, 1985: 3 arid districts in Rajasthan and 2 districts in Madhya Pradesh	Greater reliance on CPRs for grazing, fuel wood, fodder and food for small farmers and the landless than for large farmers Privatisation helps the rich more than the poor. Households already owning above 15 hectares of land acquired 63% of newly privatised CPRs, often with the most fertile soils
*Jodha, 1990, 1986	31-42% of total farm inputs from cash or kind inflows from CPRs in small and marginal farm households. Employment generated by CPRs for poor was higher than on-farm or public works.
* Iyengar and Shukla, 1999: survey of 15 villages in Gujarat	CPRs made up 0.1-11% of consumption expenditure of farm households and 1-22% of non-farm households
* Iyengar, 1997 1989: 25 Gujarat villages with a focus on non-forest products	Dependence on CPRs was largely for grazing and fuel wood, dependence was higher in drought prone areas
Beck and Ghosh, 2000; *Gosh, 1998; *Beck, 1998: survey of seven villages across the agro-ecological zones of West Bengal	10-15% of poor households' income from CPRs became more important the poorer the household. Fodder and fuel are the most important CPRs accessed by the poor, most collection is made by women and girls. Modernisation is excluding the poor from CPRs
* Chen, 1991: single village study of 59 poor households in Ahmedabad District of Gujarat	70% of fuel and 55% of fodder collected from CPRs by poor households, more important to the poor than to the better off. Gradual decline in CPRs over the last 30 years through privatisation, with conflict over CPRs increasing in times of crisis
* Singh, Singh and Singh, 1996: study of 8 villages in the semi-arid region of the Punjab	CPRs contribute 27% to the total gross income of the landless and 22% to cultivating households
* Agrawal, 1997, Agrawal 1995, Agrawal, 1991: literature reviews and fieldwork throughout India	30 million or more people depend wholly or substantially on non-timber forest products, particularly important in the lean season. Women and children play a central role in accessing CPRs and have detailed knowledge of cultivated and wild crops. Access to CPRs has declined across India in the last 30 years
* Beck, 1994: study of 3 villages in West Bengal	CPRs contribute 19-29% of household income for very poor villagers. Conflict of CPRs is central to the experience of poverty

Reference	Evidence
* Pasha, 1992: study of three villages in Karnataka	CPRs make up 10% of gross income of poor households. Area of CPRs has declined by 33% over last 20 years
Beck, 1995: study of three villages in West Bengal	Poor households gather between 780 and 1195 rupees a year in CPRs, equivalent to 25% of average yearly monetary income. Collection in CPR is mainly the work of women and so its contribution to household income is often overlooked
Karanth, 1992: study of CPR privatisation in Rajapura in Bangalore	Privatisation can be traced back to streamlining land tenure under British Administration. Subsequent stages of privatisation have all benefited the landed elite, even when they were supposed to target the poor. Land tenure reform/privatisation has led to encroachment of CPR by elites as a way to ensure title. Village pasture has been gradually depleted, as have forest resources used as an alternative to pasture
Pasha, 1991: study of three villages in Karnataka, India	Small and marginal farmers rely on CPRs for grazing livestock. Land reforms have led to CPRs becoming open access or encroached by elites, leaving poor farmers struggling to maintain their stock and the subsistence source of income they provide
Sahoo & Misra, 1994: study of three coastal villages on the Bay of Bengal, India	Village economy is largely influenced by CPRs; people depend on them for food, fodder, fuel and other products. Fish from estuaries and the sea provide a cheap source of protein for poor people; 55-72% of the landless poor are dependent on CPRs for firewood collection, minor products such as shells contribute 1,700 rupees a year to poor households' income. Poor households spend around 10-20% of total daily time in CPR activities. Although the poor have received allotted land through land reforms they are unable to exploit them because of a lack of resources – land reform on its own is not enough
Adhikari, H, 2005, Adhikari, De Falco & Lovett, 2004: community forests in Nepal	On average poor households obtain 7,756 Nepalese rupees gross income from community forests annually, compared to 24,466 per year for richer households. Richer households derive greater benefits because of land and livestock holdings; 85% of income from community forests is from collecting livestock related products such as grass and leaf litter

Reference	Evidence
Jodha, 1986: 82 village survey in dry tropical west and south India Dasgupta, 1998: review of the economics of poverty	CPRs contribute between 15 and 23% of poor people's income and contribute to improving village equity. The income from CPRs is higher than that generated through anti-poverty programmes in many areas. Poor households are losing access to CPRs (decline of 26-50% between mid 1950s and 1980s). CPRs may be the only non-human asset that the landless have at their disposal

*Primary source: Beck & Nesmith (2001)

Table 6. CPR Evidence from Africa

Reference	Evidence
* IFAD, 1995: review of papers on CPRs and the poor in Sub-Saharan Africa	CPRs are important to the rural poor, should be part of development strategies with projects aimed at the rich and poor
* Arnold and Townson, 1998: compiled data from surveys of seven Sub-Saharan countries	Approximately 15 million people involved in forest based activities. Income particularly important for the poor in meeting contingencies and dealing with seasonal fluctuations
* Osemeobo, 1993: data from 15 rural settlements in rainforest areas of Edo, Ondo, and Ogun states in Nigeria	Use CPRs for food, fuel wood, income generation, traditional medicine. All use CPRs but poor are dependent on them. Individual earnings range from US$817-5200 per annum
* Osemeobo, 1991: data from 21 rural Nigerian settlements with dominant forest or savanna vegetation	Rural women earn between US$453-750 annually through collected products. Forests are vital for the rural economy
* Becker, forthcoming: case study of differentiation of forest users in Soro village, Mali	All households relied on CPRs to some extent, reliance greatest amongst women and poor households who sold products to buy food. Women earned 79% of their income from firewood and shea butter sales, collected from CPRs
* Dei, 1992: study of 412 households in Ayirebi town, Ghana	Poorest households rely on CPRs to meet 20% of their food requirements in the lean season, compared to 2% and 8% for wealthy and middle-income households
Birch-Thomsen, Frederiksen & Sano, 2001: survey of 34 households in Ikuwala village, Tanzania	60% of poorest households rely on natural resources to provide at least part of their income. Collection and sale of thatching grass and fuel wood are the key CPR uses
Nduma, Kristjanson & McPeak, 2001: Survey of 102 women in and around Korr town, northern Kenya	22% of women generate part of their income from the sale of fuel wood collected from CPRs
Seppala, 1996: village study in Lindi district, Tanzania	Natural resource extraction from CPRs such as wood collection, forest products, gathering of root crops, fruits and mushrooms generally the preserve of the poor, either because of low economic returns or as an alternative to labouring

Reference	Evidence
Shackleton, Shackleton & Cousins, 2000: review of studies in the communal lands of several southern African countries	Over 100 goods are derived from woodland resources in Shindi, Zimbabwe. In South Africa communities in three villages regularly use between 18 and 27 wild products and 100-300 species, excluding medicinal plants. In the studies examined, the most commonly used products are fuel wood, construction wood, wild fruits, herbs and fodder. Wild foods can provide up to 50% of household food in lean periods in Namibia. In Zimbabwe, on average, 40% of cash income for poorer households comes from wild products
Cousins, 1996: review of livestock and rural livelihoods in South Africa	The role of livestock is most important through milk production and as a form of savings. However, livestock ownership is highly skewed towards elites, allowing them to manipulate communal tenure systems to their own benefit
Cavendish, 2000: household panel survey of 197 households in 29 villages in Shindi District, Zimbabwe	Income from a wide variety of environmental resources makes up over 40% of poor people's income compared to 30% of the wealthy. Poor people are more resource dependent than the rich, but absolute demand for resources does not decline with income: the rich use more resources but it contributes less to their overall income
Kerapeletswe, C. 2002: Survey of 500 households in two regions in Botswana	CPRs account for 41% of total income for all households surveyed, CPRs contribute over 50% of the income of the poor compared to an average of 17% for wealthy households. Lower income groups rely more heavily on CPRs for wild fruits and vegetables, firewood and building materials. However, there is an increase in reliance on CPRs for livestock grazing in the wealthier households. The poor rely on CPRs more for subsistence while the richer households use CPRs more for commercial uses
* IFAD, 1995: review of papers on CPRs and the poor in Sub-Saharan Africa	CPRs are important to the rural poor, and should be part of development strategies with projects aimed at the rich and poor

*Primary source: Beck & Nesmith (2001)

General findings on CPR evidence

The general consensus seems to be that CPRs contribute disproportionately to the livelihoods of the poor. They rely on CPRs to provide at least part of their livelihoods, and the major uses are fuel wood collection, fodder collection and wild foods. CPR products are not just for subsistence, although this is important and can be especially important in lean seasons, but can provide an income through sales by which poorer households can generate cash for other necessities.

However, there is increasing evidence for 'elite capture'. For example, Adhikari et al. (2004), which suggests that the wealthy gain more from community forests than the poor. The wealthy generally own more livestock and so benefit more from collection of fodder and leaf litter from community forests. This can also be argued to be the

case in communal pasture systems where flows of resources through communal pastures will be captured more by the wealthy than by the poor because of their greater livestock holdings (Cousins 2000). However Shackleton et al. (2000) have suggested that poorer members of the community can still benefit by up to 7% of the net annual value of all benefits from livestock through gifts in the form of meat, milk or ploughing services, and many are allowed to collect dung freely for use as manure or in building.

There is some evidence here that disputes the suggestion that land tenure reform will benefit the poor. Privatisation has generally benefited the wealthy elite, who have been able to take advantage of land reforms to increase their holdings, reducing the amount of CPRs available to the poor. Even when the poor have been allocated land through privatisation, their lack of assets means that many are unable to exploit the opportunities that privatisation presents.

Development of framework for analysis

The following framework was developed following initial consultation and literature review, and formed the basis for the study's analysis of the RNRRS projects which researched CPR issues. The framework operated at three levels, from high level Millennium Development Goals, through DFID future spending channels, to specific details of individual projects.

Level 1. Millennium Development Goals

The relevant goals are 1 and 7.

Goal 1. Eradicate extreme poverty and hunger. Reduce by half the proportion of people living on less than a dollar a day. Reduce by half the proportion of people who suffer from hunger. We looked for information on the role that CPRs play in poverty alleviation and mitigation.

Goal 7. Ensure environmental sustainability. Integrate the principles of sustainable development into country policies and programmes; reverse loss of environmental resources. Reduce by half the proportion of people without sustainable access to safe drinking water. Achieve significant improvement in lives of at least 100 million slum dwellers by 2020. Many projects addressed CPR management, so they can be used to develop sustainable management of CPRs. This is key to environmental sustainability. Water is an important CPR, and appropriate management can improve sustainable access to water resources. Urban CPRs are an under-researched area, but they are likely to be important resources for rapidly expanding urban populations.

It is worth noting here that, while MDGs 1 and 7 were chosen to inform this project's framework for analysis as they constitute the principal MDGs where CPRs make a clear contribution, CPRs also make direct and indirect contributions to several other MDGs. For instance, when CPRs are destroyed the burden falls disproportionately on women and girls, as they have to spend more time collecting environmental goods. This in turn has a negative impact on education, literacy and other opportunities related to empowerment and income generation. This is of relevance to MDGs 2 (***Achieve universal primary education***) and 3 (***Promote gender equality and empower women***). CPRs such as non-timber forest products (NTFPs), including a variety of medicinal plants, also play important roles in health care as about 80 per cent of the world's people rely on traditional healthcare systems. This is of relevance to MDGs 4 (***Reduce child mortality***), 5 (***Improve maternal health***), and 6 (***Combat HIV/AIDS, malaria and other diseases***).

Level 2. Future DFID spending channels

The new DFID proposed strategy for research on sustainable agriculture suggests that funding will go down four channels:

1. Blue skies research administered by the research councils. We assessed projects for areas of CPR research where continued support is needed and identified gaps for future new research areas.

2. Follow-up to existing DFID natural resource projects. We highlighted the most successful and promising avenues for CPR research that can go forward for validation.

3. Research relevant to the regional centres. The study highlights CPR research relevant to the four proposed regional centres of Eastern Africa, Western Africa, Southern Africa and South Asia. This is research carried out in the regions and research in other areas which can be transferred to the regions.

4. International agricultural research centres. CGIAR centres have a strong interest in management of CPRs, for example the Collective Action and Property Rights programme at IFPRI. We assessed projects for information on DFID NR research on CPRs for the relevant CGIAR programmes, as well as highlighting promising areas of future research.

Level 3. Projects

Projects used within the analysis provided examples of evidence-based outputs of research on CPRs. Both positive and negative lessons learnt were sought and tested against contemporary issues in CPR theory. Examples of projects that include capacity building and development of science in host countries are also important.

Review of RNRRS projects

RNRRS projects were analysed using the framework outlined above that assessed CPR-relevant contributions at three distinct levels:

1. Achieving the Millennium Development Goals (MDGs);
2. Relevance to future DFID spending channels, and;
3. Important individual project features and insights.

Table 7 details the 43 projects that were reviewed within this study.

Table 7. RNRRS projects reviewed

RNRRS Programme	Node Suite	Production System	Project code	Title
AFGRP	N/A	N/A	R7917	Self-recruiting species in aquaculture, their role in rural livelihoods
FRP	N/A	TMF	R5590	Sustainability of economic activities based on non-timber forest products
FRP	N/A	H 2	R6320	Sustainable community forest management and carbon sequestration in indigenous communities in Chiapas, Mexico
FRP	N/A	FAI	R6511	Enhancing the role of non wood tree products (NWTP) in livelihood strategies of smallholders in Semi-arid Kenya
FRP	N/A	FAI	R6914	The economic analysis of stakeholder participation in participatory forest management (PFM)
FRP	N/A	FAI	R7374	Rural livelihoods and carbon management
FRP	N/A	N/A	ZF0165	Strategic researchable constraints for participatory forest management (linked to R8101)
FMSP	N/A	N/A	R6436	The performance of customary marine tenure in the management of community fishery resources in Melanesia
FMSP	N/A	N/A	R7334	The management of conflict in tropical fisheries
FMSP	N/A	N/A	R8467	Incorporating common pool resource (CPR) issues into fisheries management policy in developing countries
LPP	N/A	SA	R7432	Participatory development of community-based management plans for livestock feed resources in the semi-arid areas of Zimbabwe
NRSP	TC 3 - CPRs	FAI	R6386 & PD066	Review of common property rights, tenure and access rights in relation to land use management and planning at the Forest Agriculture Interface
NRSP	Ba	SEM	R6744	Indigenous knowledge and natural resources research: Bangladesh floodplains
NRSP	Ba 1	LWI	R6756	Investigation of livelihood strategies and resource use patterns in floodplain production systems based on rice and fish in Bangladesh
NRSP	Ba 1	LWI	R7562	Methods for consensus building for management of common property resources

NRSP	Ba 1	LWI	R8223	A learning and communications programme for the PAPD method
NRSP	Ba 1	LWI	PD131	The effectiveness of the PAPD method: a comparison of community organisation experience in the CBFM-2 project
NRSP	Ba 1	LWI	R8103	Consensus for a holistic approach to improve rural-livelihoods in riverine-islands of Bangladesh (CHAR)
NRSP	Ba 1 & 3	LWI	R8195	Integrated floodplain management - institutional environments and participatory methods
NRSP	Ba 3	LWI	R8306	Better options for integrated floodplain management - uptake promotion
NRSP	Ne 1	FAI	R6778	Community forestry in Nepal: Sustainability and impacts on common and private property resource management
NRSP	Ne 1	FAI	R7975	Social structure, livelihoods and the management of CPRs in Nepal
NRSP	Ca 1	LWI	R6919	Evaluating the trade-offs between users of marine protected areas in the Caribbean
NRSP	Ca 1	LWI	R7408	Building consensus amongst stakeholders for management of natural resources at the Land Water Interface
NRSP	Ca 1	LWI	R8317	Pro-poor policies and institutional arrangements for coastal management in the Caribbean
NRSP	EA 2	H	R7856	Strengthening social capital for improving policies and decision-making in NRM
NRSP	EA 3	SA	R7857	Review of common pool resource management in Tanzania
NRSP	EA 3	SA	R7150	A synthesis of two case studies where wildlife, tourism and pastoralism interact in Kenya
NRSP	EA 3	SA	R7304	Zimbabwe: Micro-catchment management and common property resources
NRSP	EA 3	SA	R7973	Policy implications of common property resource (CPR) knowledge in India, Zimbabwe and Tanzania
NRSP	In 3	SA	R8280	Incorporating stakeholder perceptions in participatory forest management in India
NRSP	EA 3	SA	R8116	Improving management of common pool resources in rainwater harvesting systems
NRSP	EA 2	Cross-cutting	R8400	Advancing the use of the products of NRSP's past and current research projects in Eastern Africa
NRSP	Gh 1	FAI	R7577	Environmental policies and livelihoods in the forest margins of Brazil and Ghana
NRSP	Gh 1	FAI	R7957	Poverty dimensions of public governance and forest management in Ghana
NRSP	Gh 1	FAI	R8258	Informing the policy process: Decentralisation and environmental democracy in Ghana

NRSP	PUI 2	PUI	R7867	Filling gaps in knowledge about the peri-urban interface around Hubli-Dharwad
NRSP	PUI 2	PUI	R7872	Renewable natural resource-use in livelihoods at the Calcutta peri-urban interface
NRSP	In 3	SA	R7877	Common pool resources (CPRs) in semi-arid India – dynamics, management and livelihood contributions
NRSP	In 3	SA	R7974	Human and social capital aspects of soil nutrient management, semi-arid India
NRSP	In 3	SA	R8192	Enabling rural poor for better livelihoods through improved natural resource management in SAT India
NRSP	In 1	HP	R8100	Investigating improved policy on aquaculture service provision to poor people
NRSP	In 1	HP	R8334	Promoting the pro-poor policy lessons of R8100 with key policy actors in India

Detailed project summaries are provided in Appendix I. Below is a brief summary of the findings from the project analysis.

1. Achieving the Millennium Development Goals (MDGs)
By assisting in achieving sustainable CPR management, all the RNRRS projects reviewed here have directly contributed to the achievement of MDGs 1 (Eradicate extreme poverty and hunger) and 7 (Ensure environmental sustainability). For example, **AFGRP R7917** (Self-recruiting species [SRS] in aquaculture, their role in rural livelihoods) applied a combination of social and natural science techniques to demonstrate a 'win-win' management approach that benefited wealthy and poor people as well as the environment. SRS are aquatic animals such as fish and prawns that can exist and be harvested sustainably from a farmer-managed system without regular stocking, but do not constitute the species of commercial interest to the farmer. SRS from private fish ponds are a critical common pool resource for poor people during the dry season. The project observed that, at the same time as providing livelihood benefits to poor people, SRS enhance the productivity of commercial species in stocked ponds. Therefore, maintaining high levels of biodiversity in managed ponds by allowing sustained presence of SRS can provide positive economic returns for all community members, wealthy and poor.

Another example of a project's contribution to achieving the MDGs is **NRSP R8280** (Incorporating stakeholder perceptions in participatory forest management in India). The project improved policy and institutional arrangements for pro-poor, environmentally sustainable participatory forest management through the development of a methodology that can empirically articulate the perceptions of key CPR users, including the poorest, most marginalised and often illiterate users. By articulating both areas of conflict and consensus between different CPR users, this methodology provides the potential for evidence-based policy responses that can improve CPR management to the benefit of the poor.

An example from a semi-arid production system is **NRSP R8116** (Improving management of common pool resources in rainwater harvesting systems). Water is a critical CPR in semi-arid regions where rainfall is often a limiting factor in

agricultural production. The NRSP's rainwater harvesting programme has contributed to the security and intensification of agricultural production in semi-arid regions and helped to reduce poor people's vulnerability to erratic and variable rainfall patterns, with enormous potential for reducing poverty and hunger. Rainwater harvesting techniques have also contributed to environmental sustainability through providing sustainable access to water.

2. Relevance to future DFID spending channels
The projects demonstrated a high quality of evidence-based, interdisciplinary research that highlighted a range of relevant points of focus for all four of DFID's expected future spending channels.

Channel 1. Blue skies research administered by the research councils
Several of the projects highlighted the importance of including an explicit focus on the role of CPRs in achieving the MDGs within DFID's approach to horizon scanning and blue skies research. This includes issues such as the role of CPRs in dealing with climate variability (e.g. **FRP R6320** and **R7374**), how to manage aquatic CPRs (e.g. **AFGRP R7917 and NRSP R8116**) and the role CPRs play in agriculture and livestock management (elements of this theme were evident across the majority of selected projects).

Channel 2. Follow-up to existing DFID natural resource projects
There are several examples of RNRRS projects that exemplify best practice in interdisciplinary CPR research (e.g. **NRSP R6756, AFGRP R7917, NRSP R8116, NRSP R6778, FRP R6320 and R7374, FRP R6914, NRSP R7577** and **NRSP R7408**). Following up insights and questions raised by such projects provides an excellent opportunity for DFID to build on its existing natural resources work.

One critical follow-up area identified was the role of CPRs in the peri-urban interface, for which the work done within the NRSP will provide an excellent knowledge base to build on (see, for example, **NRSP R7867** Filling gaps in knowledge about the peri-urban interface around Hubli-Dharwad, and **NRSP R7872** Renewable natural resource-use in livelihoods at the Calcutta peri-urban interface).

Channel 3. Research relevant to the regional centres
A key issue raised by policy makers and practitioners in the consultation stage of R8501 was a need for more cross-cutting research that explores the applicability of CPR management research within different geographical contexts. Throughout the majority of the projects reviewed, opportunities were identified for exploring the relevance of project findings within DFID's new regional centres. For example, lessons learned from **FRP R6320** (Sustainable community forest management and carbon sequestration in indigenous communities in Chiapas, Mexico) in the successful application of carbon sequestration at the village level could be transferred to the new regional centres in Africa and South Asia. The 'Plan Vivo' approach developed in Mexico is already being applied in the Nhambita Community Carbon Project, Mozambique, and Trees for Global Benefit, Uganda.

Channel 4. International agricultural research centres
The projects demonstrated the key role that CPRs play in poverty reduction. This suggests a need for an explicit focus on CPR research within the international

agricultural research centres, a view supported within R8501's consultation. For example, the broad areas of research interest identified in the consultation carried out within **FRP ZF0165** (Strategic researchable constraints for participatory forest management) could be promoted within CGIAR research agendas.

3. Important individual project features and insights
Each individual project exhibited specific features that provided valuable tools and/or insights for those concerned with sustainable CPR management. Tools included evidence-based frameworks for assisting in decision-making and responding to opportunities. For example, **NRSP R7973** developed a framework for the analysis and understanding of the choices involved in formulating policy for managing multiple-use CPRs in semi-arid regions of Africa and India. Another good example is provided by **NRSP R6756,** which developed an integrated biophysical and socioeconomic systems framework that could explicitly demonstrate the potential trade-offs, side-effects and points of tension resulting from single sector or narrowly focused policy interventions.

Other projects focused on developing tools in the form of applied methodologies. For example, **NRSP R8280** built on the framework developed in **NRSP R7973** to produce a methodology that facilitates the evidence-based resolution of CPR management policy conflicts to the benefit of the poor. Some projects also produced useful manuals, for example **NRSP R6919,** which created a manual for evaluating trade-offs in coastal zone management to reduce conflicts and enhance consensus building.

Project insights were numerous, and regularly of direct relevance to contemporary DFID policy concerns such as responding to global climate variability. Sometimes insights were not a direct outcome of specific project aims and objectives, but nevertheless provide valuable lessons for those concerned with CPR and natural resource management more generally. For example, **NRSP R8280** highlighted the way mutually hostile perceptions between government departments and civil society organisations acted to limit the extent that policy dialogue was influenced by the project's findings. This highlights the need to understand conflict dynamics and how to resolve them as necessary in developing sustainable CPR approaches.

4. Discussion and conclusions

This section presents the analysis carried out in Steps 5 and 6 of the study, which form the central components of the project's findings. The study concluded with the analysis presented under Step 6, which formed the basis of a summary briefing paper circulated around DFID.

Analysis of key issues arising from consultation, literature and project review

The combined analysis from Steps 1, 3 and 4 presented a number of CPR-relevant insights. Whilst most issues of relevance to CPRs are crosscutting by their very nature, for the purposes of clarity the key insights arising have been organised around nine broad themes, namely:

1. CPRs and achieving the MDGs
2. CPRs and responding to global uncertainties
3. Pressures, challenges and threats to CPRs
4. CPR management approaches
5. Impacts of external intervention in CPR management
6. Peri-urban CPRs
7. Idealising the commons
8. Strategic policy considerations
9. Conflict management and CPRs

1. CPRs and achieving the MDGs

Sustainable and equitable management of CPRs is essential in order to realise MDGs 1 (eradicate extreme poverty and hunger) and 7 (ensure environmental sustainability). The livelihoods of many people in developing countries are inextricably linked with CPRs. For example, a survey in six countries in eastern and southern Africa by **FRP R5590** showed that south of the Sahara an estimated 15 million people could be engaged in forest product harvesting. As well as providing an essential subsistence base for the poorest and most marginalised social groups, CPRs have also often been observed to support access to new market opportunities among these groups. For example, **NRSP R7974** identified the role of CPRs in providing the landless and marginalised poor with access to emerging markets for organic fertilisers in semi-arid India as a result of government policies that have led to increased cattle ownership amongst these groups. Maintaining these livelihood contributions is usually dependent on the CPR being managed sustainably. Sustainable CPR management thus contributes to both poverty reduction and environmental sustainability.

2. CPRs and responding to global uncertainties

A vital area for future research is the investigation of what challenges such as climate change (**FRP R6320** and **R7374** make a relevant contribution here), HIV/AIDS, diseases such as bird flu, and major resource variability (e.g. climate variability, which is likely to worsen under future climate change scenarios) mean for local CPR management. How are people adapting? Who's gaining / losing? How are people building resilience? And what are the ingredients of a successful response? Such research will provide policy makers with essential tools and insights into approaches to dealing with these global challenges, and has significant pre-emptive value.

3. Pressures, challenges and threats to CPRs

CPRs are subject to a range of pressures, challenges and threats. For example, the increasing emphasis on and incentives for intensive farming practices is often observed to drive privatisation of natural resources and exclusion of vulnerable groups from previously communal land. The penetration of market relations into areas previously regulated by traditional institutions may present its own unique challenges to CPR management. There may also be conflicts between achieving livelihood and environment objectives. For example, NRSP R7150 highlighted a situation where

community wildlife conservation is dependent on high income generation potential, capacity building and accountability in local institutions, accompanied by dialogue and strong links between communities and local/national government structures. Without these conditions wildlife conservation is likely to have a negative impact on food security and incomes. Understanding these pressures, challenges and threats is integral to developing pro-poor policy that properly recognises and builds upon the role of CPRs in achieving the MDGs.

4. CPR management approaches

Effective policy responses that utilise the potential contribution of CPRs to achieve the MDGs are reliant on a proper understanding of the issues that determine sustainable CPR management. A wide range of relevant issues emerged during this study, some of which have been addressed, either directly or indirectly, by RNRRS projects, and others which require further research/policy attention. The issues can be broadly summarised as:

- Tenure security (**FRP R6386** and **NRSP PD066** are of relevance here)
- Negotiating rights of access to CPRs (**NRSP R6744, NRSP R6756, NRSP R7562, NRSP R6919** and **NRSP R7408** make contributions here)
- Understanding the effectiveness of CPR management in the face of commercialisation (**FRP R6320** and **FRP R7374** make contributions here)
- Indigenous knowledge of CPRs (**NRSP R7973** is of relevance here)
- Maintaining/re-establishing co-operation
- Achieving community participation (**FRP R6914, LPP R7432, NRSP R6756, NRSP R6744, NRSP R8103** and **R8306** make contributions here)
- Common Pool vs. Common Property – understanding the difference
- Sustainability of new CPR uses
- Defining capacity limits
- Impact of new participatory mechanisms for NRM (**FRP ZF0118, FRP ZF0165, NRSP R8103, NRSP R8306, NRSP PD131, NRSP R7856** and **NRSP R8400** are of relevance here)
- Understanding lessons from the use of traditional technology in NRM in the context of new technology

5. Impacts of external intervention in CPR management

A key issue to take on board with regard to external intervention in CPR management is the fact that there are no 'one size fits all' approaches. In recognition of this, the RNRRS has funded a number of projects that have developed evidence-based frameworks for assisting policy makers and researchers in decision-making and responding to CPR management opportunities. For example, **NRSP R7973** developed a framework for the analysis and understanding of the choices involved in formulating policy for managing multiple-use CPRs in semi-arid regions of Africa and India. This framework provides the basis for a methodology developed in **NRSP R8280,** which facilitates the evidence-based resolution of CPR management policy conflicts to the benefit of the poor.

A related issue is the limitations of sectorally focused approaches that fail to capture the complex interrelationships between different natural resource systems. Again, there are contributions from the RNRRS here. For example, **NRSP R6756** developed an integrated biophysical and socioeconomic systems framework that could explicitly demonstrate the potential trade-offs, side-effects and points of tension resulting from

single sector or narrowly focused policy interventions. In association with **NRSP R6744**, a methodology was also developed for the local interpretation of natural resources management and decision-making by different producer groups.

6. Peri-urban CPRs

Despite the valuable work that the RNRRS has focused on peri-urban production systems, this study has highlighted a lack of specific knowledge within the broader CPR management field as to the dynamics and contributions of peri-urban and urban CPRs. Urban areas tend to have the highest land values, and hence highest pressure on the commons, often resulting in privatisation. Many of the slums/informal settlements are on land that was set-aside for commons. This is of increasing relevance due to current high rates of urbanisation. Three important questions to be addressed here are:

1. How important are peri-urban CPRs in terms of the role they play in peri-urban livelihoods?
2. If peri-urban CPRs are inevitably being transformed to private property resources, how can this transition be managed so that it is equitable and inclusive of the poor?
3. What are the specific characteristics of peri-urban CPRs, and is the influence of urbanisation on them positive or negative (e.g. increasing competition for land and water, opportunities due to demand from urban markets and constraints such as pollution and natural resource degradation)?

7. Idealising the commons

It is important not to idealise the commons. Many CPRs are not effectively managed, or if they are effectively managed, the distribution of benefits may not be equitable. There is high variability. For example, **NRSP R7304** demonstrated that, in the case of micro-catchment CPRs in Zimbabwe, local interventions in natural resource management were unlikely to reduce poverty. There were a number of reasons for this, including:

- Natural resource management is characterised by complex physical and social dynamics that do not always work in accord with one another.
- Local management has greater legitimacy for local communities, but is marginalised by the national governance frameworks. Local management, however, does not necessarily mean better management, since there can be high levels of corruption and rent seeking.
- Huge climate fluctuations can have more important impacts on resources than human use. This variability will often override any local initiatives to improve incomes from natural resources.

NRSP R7975 also highlighted the fact that community management does not necessarily mean equitable access to the resources by poor people. The project demonstrated that a change to community forest management in the Terai region of Nepal has been accompanied by a loss of access by the Tharu, the original inhabitants of the Terai who traditionally used the forests on a seasonal basis.

8. Strategic policy considerations

A number of strategic policy considerations have emerged from both consultation and analysis of RNRRS projects. In responding to the issues raised above to harness the potential role of CPRs in achieving the MDGs, policy makers should consider the following issues:

- There are no 'one size fits all' policies (**NRSP R7973** and **NRSP R8280** make particular contributions here).
- Links between CPRs and broader policy frameworks e.g. PRSPs (**FRP R6320, FRP R7374** and **NRSP R7150** make contributions here).
- Need for coherent DFID approach to CPR research .
- Many respondents to the consultation perceived a broad failure to translate research into policy. The certain projects within the NRSP have, however, led to successful uptake of research into policy. For example, communication work conducted during rainwater harvesting research resulted in a favourable change in policy for water management and conservation. (**NRSP R8115** and **NRSP R8116** provide insights here). Another example is provided by the Indian national policy directive on length of leases relating to use of (CPR) seasonal ponds in eastern India that led to state-level policy changes (the NRSP Annual Report 2003-04, Part I, pages SSxi-xii and **NRSP R8334** are of relevance here). In both examples above it was the high standard of communication with policy-relevant stakeholders that stimulated the policy changes.
- Communicating best practice.
- Inadequacies of macro-economic policy solutions.
- Need for interdisciplinary approach to CPR research (There are several examples of RNRRS projects that exemplify best practice in inter-disciplinary CPR research, e.g. **NRSP R6756, AFGRP R7917, NRSP R8116, NRSP R6778, FRP R6320 and R7374, FRP R6914, NRSP R7577** and **NRSP R7408**).
- Need for improved, flexible and more long-term monitoring and evaluation.
- Need to understand links between policy processes and *why* certain issues make it into policy while others remain excluded from policy consideration.

9. Conflict resolution and CPRs

It is clear from the analysis above and the analysis of RNRRS projects presented in Appendix 1 that RNRRS projects make strong contributions across a range of areas of contemporary concern with regard to CPRs and poverty alleviation. A common theme that arose throughout the consultation, however, was the need for effective techniques to resolve the tensions and conflicts that surround many of the central issues of contemporary concern with regard to socially equitable and environmentally sustainable CPR management.

To recap, the consultation raised three key issues, namely:

1. Concern regarding a perceived potential narrowing of DFID's approach to science and technology that may not adequately recognise the need to combine insights from the social and natural sciences in order to address problems that have no technical solution.
2. Concern regarding the impact on poor and marginalised people of the current trend towards privatisation of common resources and the accompanying emphasis on macro-economic approaches to poverty alleviation. This highlights important conflicts between commercial and non-commercial CPR uses.
3. The need to develop effective negotiation techniques to address conflicts relating to CPR tenure regimes.

Clearly, conflict resolution is a central requirement in addressing issues 2 and 3. This requirement also highlights the potential gap between DFID's perceived future focus on technical solutions to poverty alleviation, such as biotechnology, and the more complex, interdisciplinary approaches that are required to resolve the conflicts around CPRs that are impacting most strongly on poor and marginalised people.

During the analysis of RNRRS CPR projects it became clear that a strong contribution had been made in developing and testing a range of interdisciplinary, evidence-based techniques and methodologies that were of clear value in conflict resolution around CPRs. This work is explored in more detail in the next section of this report, but included, for example, the work of **NRSP R6756** and **NRSP R6744** that is highlighted above. Other examples include **NRSP R7562**, which developed consensus-building methodologies to enable sustainable management of CPRs together with a typology of methodologies and a decision tree to guide managers of CPRs in their application. **NRSP R6919** and **NRSP R7408** also researched techniques of trade-off analysis and consensus building in the coastal zone.

The aim of this synthesis study centred around the identification of DFID's knowledge gaps on CPRs and poverty reduction, and the identification of relevant lessons learnt from the RNRRS. Due to the centrality of conflict resolution to the majority of gaps highlighted within the consultation and literature review, and the definite contribution of RNRRS CPR projects in this field, conflict resolution therefore presented as the central theme around which this study's analysis could be distilled for uptake promotion within DFID. The following section details the initial text and analysis around which the summary briefing document for DFID contained within Annex B was based.

Preventing Conflicts - Research into Management of Common Pool Resources

Introduction

Conflict over the common pool natural resources vital to poor people has a long history. But conflict can be avoided and consensus created by applying the techniques described here so that natural resources can be managed equitably and efficiently. These techniques are also essential for paving the way for appliance of science in poverty alleviation.

Conflict is expensive, time consuming and destabilising. For example, in the transition between high and low rainfall regions there have always been clashes between sedentary farmers and nomadic herders. The potential for international disputes over water have led to the suggestion that 'the wars of the next century will be about water'[1]. At the local scale, people dispute access to land and fishing rights. Social solutions are needed to overcome conflict and ensure sustainable use of natural resources. In his classic paper on the 'Tragedy of the Commons', Garrett Hardin (1968) uses the example of over-exploitation resulting from open grazing rights to demonstrate that there is a class of 'no technical solution problems'. In other words, a technical solution to a natural resource issue may exist, such as the introduction of drought resistant crop varieties or a livestock vaccine, but a social solution is needed to ensure any technical solution will be implemented effectively. Conflicts and preconceptions can prevent the technological innovations from being taken up, stopping the poor benefiting from scientific advances that have taken place in developed countries. But this does not need to be the case. Techniques are available that bring together different stakeholders in the resource and also reconcile needs and perceptions.

CPRs and livelihoods

The livelihoods of many people in developing countries, especially from the poorest and most marginalised groups, are inextricably linked with CPRs. CPRs are natural resources such as forests, water, fish and grazing land that are accessed by multiple user groups. They can be managed under a range of property regimes – from open access through communal to private. The livelihood contribution of CPRs is well known. In India, for example, CPRs are estimated to contribute around $5 billion a year to incomes of poor rural households[2] (two-and-a-half times World Bank lending to India in 1996).

As well as providing an essential subsistence base for the poorest and most marginalised social groups, CPRs have also often been observed to support access to new market opportunities among these groups. Maintaining these livelihood contributions is dependent on the CPR being managed sustainably. Sustainable CPR management thus contributes directly to both poverty reduction and environmental sustainability. Furthermore, CPRs have a fundamental role in enabling communities to cope with future stresses, such as those caused by climate variability, that are likely to worsen under future climate change predictions.

[1] World Bank Vice President Ismail Serageldin speaking in 1995.

[2] Beck, T. and Nesmith, C. (2001) Building on poor people's capacities: the case of common property resources in India and West Africa. World Development 29, 119-133. Additional references on the value of CPRs are in NRSP R8501 Annex A.

CPRs and Policy
CPRs have a fundamental role to play in meeting policy obligations. They are central to poverty alleviation and so are important for tackling the first Millennium Development Goal[3] (MDG) of eradication of extreme poverty and hunger. Sustainable management of CPRs is also critical for achieving MDG 7 – ensuring environmental sustainability and reversing the loss of environmental resources.

Much of the world's biodiversity lives in ecosystems managed as common pool resources, and continued access to CPRs is responsible for maintaining traditional lifestyles. CPRs thus have a central role to play in implementing the Convention on Biological Diversity[4].

The Kyoto Protocol came into force on 16 February 2005[5]. This opens the door for funding to flow to communal sustainable environmental management of carbon-positive CPRs under the Clean Development Mechanism.

Property rights are currently the focus of much attention in the policy arena. The recent launch of the 'High Level Commission on Legal Empowerment of the Poor'[6] emphasises the central role placed on guaranteeing the poor the right to property as a means to poverty alleviation. Ensuring the continued flow of benefits from CPRs to the poor will be fundamental to the commission's work.

Conflicts over CPR management
Managing CPRs is not easy. They are available to more than one person, so potentially one person's use of the commons can subtract from its use by others, and there is difficulty in excluding access. If communal management norms become eroded, CPRs can therefore be subject to degradation from overuse – the 'Tragedy of the Commons'. As with many natural resources, CPRs are subject to external pressures such as increasing emphasis on intensive farming practices or management for unsustainable short-term benefits such as timber extraction.

As a result of these pressures, which can result in exclusion of certain user groups, their management is increasingly characterised by conflict. Conflict management therefore has a critical role to play in developing sustainable, pro-poor CPR management regimes. This study has identified three specific areas of conflict management where RNRRS projects have made a contribution:

A. Managing conflicts between competing CPR user groups
B. Managing conflicts between commercial and non-commercial resource uses
C. Managing livelihood / environment conflicts

A. Managing conflicts between competing CPR user groups
CPR management is complicated by the fact that different people often depend on them for different reasons. This can lead to conflict between competing user groups. For example, in semi-arid areas conflicts can arise between agriculturalists and

[3] http://www.un.org/millenniumgoals/.
[4] http://www.biodiv.org/. Article 8. In-situ Conservation.
[5] http://unfccc.int/.
[6] The commission was launched on 6 September 2005 and is co-chaired by Madeline K. Albright, a former secretary of state of the USA and Hernando de Soto http://legalempowerment.undp.org/.

pastoralists over access to land and water[7], and in coastal zones there can be conflict between conservation, fisheries and tourism[8]. This is further complicated when usage patterns are seasonably variable. For example, in Bangladesh poor people tend to rely more heavily on access to privately owned ponds for fish resources in the dry season than in the wet[9].

Rainwater harvesting

Water is a critical CPR in semi-arid Tanzania, which is home to the majority of Tanzania's poor[10]. Rainfall is a limiting factor in agricultural production in most semi-arid regions, with most national planners considering them as marginal for agriculture. Despite this, the semi-arid region of Tanzania is the biggest producer of crops such as maize, rice and cotton. Efficient rainwater harvesting contributes to the security and intensification of agricultural production in semi-arid regions, and so helps reduce people's vulnerability to erratic and variable rainfall patterns. This has enormous potential for reducing poverty and hunger. It also realises environmental benefits by reducing pressure for land clearance at the same time as reducing conflicts between agricultural and pastoral communities over access to water. Technical solutions researched by the RNRRS, in particular the development of the 'Parched-Thirst model'[11] which has been applied in Tanzania[12], offer enormous potential and have been taken up by the Tanzanian government at policy level[13].

An important insight provided by this suite of projects is the fact that technical solutions enabling rainwater harvesting would not benefit poor people unless attention was given to the resulting need for changes in local management institutions. Adoption of rainwater harvesting leads to a need for change in access to CPRs such as runoff, rangelands, rivers and channels. In order to ensure that the poor do not become marginalised and find their access to these CPRs removed or restricted, uptake promotion of rainwater harvesting must be accompanied by changes in the management institutions that govern use of these CPRs. Indeed, NRSP Project R8116 found that existing institutional mechanisms in semi-arid Tanzania limited poor and marginal groups' access to agriculturally relevant CPRs. For example, the rich were more likely to have adequate access to runoff (approx. 50%) compared to the poor (approx. 30%). Overall, the results of the study found that there was a general trend towards weaker groups obtaining few if any benefits from rainwater harvesting.

The following specific institutional weaknesses were identified:

- Inequality in membership of CPR management committees between different social groups.
- Lack of organisation or planning above the village level and lack of clear links between village and higher administrative levels including national policy and strategies.

[7] For example, see the Securing the Commons series that was part funded by DFID, including Banzhaf et al. (2000) and Egeimi et al. (2003).
[8] NRSP R8317, R7408, R6919.
[9] NRSP projects R7562, R8223, R8306, R8195, PD131. AFGRP project R7917.
[10] NRSP project R7857.
[11] NRSP project R6758, R7888, R7949, R8088.
[12] NRSP project R8115.
[13] NRSP project R8116.

The project addressed institutional weaknesses through:

- The formation of catchment level and village level autonomous committees with improved representation of women and the young.
- Improved CPR tenure systems and management through simplified procedures for land leases and capacity building in land policy and laws.
- Guidelines for CPR management plans and capacity building for local stakeholders.

A key resource arising from the project was a six-step planning guide for the development of small-scale rainwater harvesting projects at the catchment level aimed at facilitating improved institutional robustness (Hatibu and Mahoo 2000).

Understanding and resolving conflict in multiple-use CPRs

Conflicts arising from multiple uses of CPRs often result from stakeholders only being able to define management problems in the context of their own knowledge. Agreement on suitable solutions is difficult because stakeholder perceptions of desired responses to the problem arise from the different underlying assumptions with which they define the problem. Policy conflict over the management of CPRs is therefore not simply material, but also depends on the perceptions of protagonists (Adams et al. 2003). An understanding of these differing perceptions is fundamental to resolving CPR management conflicts.

For example, floodplains in Bangladesh are highly dynamic, diverse and productive ecosystems that are the basis for the livelihoods of the Bangladeshi people, in particular the rural poor. There are about 4 million hectares of open water and 80 per cent of households are engaged in fishing in both permanent ponds and open water. Fishing is seasonal due to flooding patterns, fish migration and spawning. The flood plains also produce rice, vegetables and other natural products. Integrated flood plain management offers the possibility of getting the best from these multiple resource systems[14].

Inevitably there are conflicts, and communities need help to be able to work together effectively and equitably. With support from NRSP[15], the technique of Participatory Action Plan Development (PAPD) was developed to build consensus among local stakeholders on their common problems and solutions for natural resource management. The method involves a series of linked local workshops with scoping, planning and implantation phases. The method was tested in the field and compared with existing NGO facilitated community development. PAPD was associated with significantly more effective formation of community-based organisations, improved attitudes and time savings. The technique was also tested on riverine sand islands where about 7 million people live, 80% of whom earn less than one dollar per day[16]. The key importance of PAPD is in its recognition of the strengths of informal institutions and power relations, and being able to overcome the failures of existing legal and institutional frameworks.

By comparing CPR conflicts in India, Tanzania and Zimbabwe, **NRSP R7973** produced an analytical framework for enabling policy dialogue on contested CPRs.

[14] NRSP Project R8306, R8195.
[15] NRSP Projects R7562, R8223, PD131.
[16] NRSP Project R8103.

This is achieved by making explicit the different assumptions, knowledge and goals for that resource which various stakeholders bring to their decision making. This framework was then tested, and a methodology for its empirical implementation developed by **NRSP R8280** in the context of participatory forest management in India. The methodology enables empirical articulation of the perceptions of key CPR users, including the poorest, most marginalised and often illiterate users.

Working with coastal communities in the Caribbean, **NRSP R7408** developed a technique of 'Trade-off Analysis' which includes all relevant stakeholders in negotiations to assess and develop appropriate management strategies. The trade-offs between different strategies are ranked or quantified, and multi-criteria analysis used to help achieve consensus (Brown et al. 2002). Quantifying and analysing economic components of CPR use can be difficult, requiring specialist expertise, but is fundamental to identifying the costs and benefits of different management approaches and determining the incentives for those utilising the CPR. Techniques for conducting economic analysis using participatory approaches have been developed by **FRP R6914** (Richards et al. 2003) overcoming the lack of capacity for formal economic analysis often found in developing countries.

B. Managing conflicts between commercial and non-commercial resource uses

When resources are communally owned, there is always the potential for conflicts to arise from incentives to exploit the resource for new commercial purposes. For example, non-timber products from forests, such as fungi, fuel wood and cattle fodder, are critical to many poor people for both home consumption and sale. The harvest of these non-timber forest products relies on forests remaining intact. Increasingly, however, short-term financial incentives for timber harvesting are resulting in the destruction of forests and the loss of the non-timber CPRs that poor people rely on. Incentives for agricultural intensification are also driving forest clearance and the appropriation of previously common land into private ownership. It is rarely the poorest, most marginalised people that gain from these new commercial activities. They do, however, incur the greatest cost, as their reliance on CPRs such as non-timber forest products tends to account for a far higher proportion of their overall subsistence.

Markets for carbon

Two RNRRS projects (**FRP R6320** and **R7374**) looked at how such conflicts might be overcome through the creation of markets for carbon under the Kyoto Protocol. This would provide a contribution to rural livelihoods in which forests and their associated non-timber products remain intact. Potentially this is a 'win-win' approach with both environmental and social gains. The concern, however, is that it is more efficient to create large plantations specifically geared towards carbon sequestration, which may have negative effects on the livelihoods of poor people as exotic plantations are unlikely to yield the kind of non-timber products that accrue in native forests. By introducing appropriate training in sustainable-yield forest management, together with institutional development and the introduction of appropriate planning methodologies, these projects successfully implemented carbon sequestration activities at a village level in Mexico. This contributed to alleviating conflicts between commercial and non-commercial forest uses. It also demonstrates the possibility of a global to local benefit transfer if appropriate mechanisms are in place.

Fish ponds
Fish-ponds offer the potential for bringing much needed protein to the poor – helping with health and income. However, the technical innovation does not help poor people unless the correct property rights are in place. Fish-ponds in India were only leased for one year, causing difficulties with pond management. **NRSP R8100** facilitated communication between the poor fish-pond users and the government, leading to a policy change with extended leases on the ponds. This is a simple solution, but highly effective.

Sometimes it is not possible for poor people to manage the fish pond. Because they cannot afford the infrastructure needed for stocked aquaculture, they rely on a harvest of aquatic animals from community water bodies and from privately owned ponds and rice fields. Under suitable agreements they can still have access to CPRs in the ponds though harvesting self-recruiting species (SRS)[17]. SRS are aquatic animals that can be harvested sustainably from a farmer-managed system without regular stocking. They include species such as fish, prawns, crabs, and snails that exist in managed ponds but do not represent the species of commercial interest to large pond owners. SRS are critical for poor people, both for home consumption and sale. Their importance varies seasonally, with the catch in open-access water bodies, including flooded rice fields, critical during the flood period, but shifting to an emphasis on ponds, ditches and as a by-catch from commercially operated ponds in the dry season. Conflicts arise between the interests of commercial pond owners who wish to pursue mono-culture fish production to the exclusion of 'wild' SRS, and poor people that rely on SRS as a CPR from private ponds. Research showed that SRS enhance productivity in commercially stocked ponds. Maintaining high levels of biodiversity in managed ponds by allowing sustained presence of SRS was therefore demonstrated to result in positive economic returns for all community members including poor, CPR-reliant people, commercial pond owners and the environment.

C. Managing livelihood / environment conflicts
A key potential conflict relevant to the management of CPRs is between livelihood requirements and the environment. Several RNRRS projects have researched evidence-based approaches for managing such conflicts, such as the coastal projects already mentioned, the creation of markets for carbon to provide financial returns for forest conservation, and the maintenance of SRS in aquaculture as discussed above. Another project (**NRSP R7150**) that provided important insights in this area looked at the interactions between wildlife conservation, tourism, and pastoralism in Kenya.

Community wildlife conservation
At first glance the potential for community wildlife conservation schemes to contribute to poverty alleviation is quite high. This project demonstrated, however, that actual benefits are often not high enough to compensate for the losses experienced by local land users such as crop damage, livestock and human losses. Although tourism income for countries such as Kenya can be considerable, few of these financial benefits reach local levels. Wildlife conservation schemes also have the potential for conflict with local livelihood strategies, especially agro-pastoral and agricultural livelihoods, although they may be more compatible with pastoral lifestyles.

[17] AFGRP R7917

The key lessons from this project are:

- Community wildlife conservation initiatives driven by tourism need to be in areas of high income generation potential.
- There needs to be capacity building and accountability in local institutions, accompanied by dialogue and strong links between communities and local/national government structures.
- Without the conditions above, wildlife is likely to have a negative impact on food security and incomes.

As a result of its findings, the project developed the following criteria for community wildlife management that is able to overcome livelihood/environment conflicts:

- Potential for cash income generation is high
- Intervention tailored to local situation
- Improved institutional links and capacity
- Increased local participation
- Inter-sectoral policy coordination

Soil conservation

Farmers tilling the poor soils of the steeply sloping hillsides of Uganda face problems of soil erosion – resulting in loss of a key CPR. There are well known technical solutions, such as digging drainage ditches and planting contour bunds. However, effective implementation of these techniques has been limited. **NRSP R7856** used participatory approaches to enable farmers to revise and reformulate existing by-laws so that they were effective. In this way, technical innovations could be implemented successfully and high level national policies made to reach out to poor farmers who rely on small scale resources.

Summary

DFID's knowledge gaps on CPRs and poverty reduction

DFID's knowledge gaps on CPRs and poverty reduction can be broadly summarised around three key themes, namely:

1. A need for greater understanding of the impact on poor and marginalised people of the current trend towards privatisation of CPRs.
2. A lack of appreciation of the potential ineffectiveness of macro-economic approaches to poverty alleviation in the absence of appropriate CPR management regimes.
3. Developing further understanding of the circumstances that define why some tenure regimes work while others do not.

As highlighted in the main body of this report, these knowledge gaps tend to centre on issues of conflict management, including conflicts between competing CPR user groups, conflicts between commercial and non-commercial resource uses and livelihood / environment conflicts. RNRRS projects have provided important insights in all these areas and it is important that these are built upon with future DFID research and policy.

There are also several less central, but nevertheless important issues that require attention from DFID. These include research into CPRs at the PUI and in urban areas, development of improved, more flexible monitoring and evaluation systems, and a more reflexive focus on why certain policy solutions, for example biotechnology, gain policy credence at any one time while other, potentially more effective solutions remain at the margins of policy dialogue.

Key policy lessons

1. CPRs are vital for poverty alleviation and environmental sustainability. Research on a wide variety of natural resources has consistently demonstrated that CPRs are an essential part of the livelihoods of poor people.
2. A prerequisite of successful policy intervention geared towards socially equitable and environmentally sustainable CPR management is an understanding of the socioeconomic and institutional conditions governing their current use.
3. Technical innovations cannot be implemented without understanding the institutions under which CPRs are governed.
4. It is necessary to understand and reconcile conflicting stakeholder perspectives and incentives in order to develop effective policy. Simple and effective tools have been developed by DFID RNRRS programmes for evidence-based analysis and resolution of these conflicts.
5. The potential exists for a local / global transfer of benefits to reduce pressure for commercialisation, which tends to exclude poor people. For example, the introduction of markets for carbon that reflect the value to the global community of carbon sequestered by forest CPRs in reducing global climate change. This could provide poor people with an economic benefit from communally managed forests, therefore reducing the pressure for commercial

timber extraction and preserving the vital services and products that poor people rely on forest CPRs for, such as fuel wood, foraged food and medicinal plants.

Translating lessons into practice

DFID should take on board the lessons learnt from the RNRRS with regard to CPRs and move forward to translate them into practice by building on them within its future work. Some key actions suggested by the analysis in this report include:

1. Ensure that DFID's future strategic direction does not lose sight of the need to combine insights from the social and natural sciences in order to address problems essential to poverty alleviation that have no technical solution. As highlighted by the House of Commons Select Committee on Science and Technology in International Development (p. 35), any perceived gap between the natural and social sciences represents an artificial dichotomy, as 'both have key roles to play, alongside governance considerations.' The RNRRS programmes have provided many examples of best practice in interdisciplinary research on CPR management. DFID should build on these examples of best practice in its future work. This includes examples such as work on institutional arrangements for effective rainwater harvesting programmes in semi-arid regions, and finding consensus between commercial and non-commercial uses of ponds in the floodplains of Bangladesh.
2. Explicitly address the need for coordinated research and policy development on CPR management. This should include maintained links with external research organisations such as CGIAR and their Systemwide Program on Property Rights and Collective Action (CAPRi).
3. Reflect on and act to address the gaps identified above in DFID's knowledge on CPRs and poverty reduction.
4. Institute a mechanism within DFID headquarters to translate research, such as that on CPRs, into development policy and practice. This should be geared towards ensuring effective communication networks so that lessons learnt from RNRRS and other DFID funded work are disseminated to policy makers and practitioners in the field. It should also respond to the point raised in the House of Commons Select Committee on Science and Technology and International Development (p. 32) with regard to poor links between DFID's central research department and its country offices.
5. Facilitate internal debate within DFID and between DFID and external practitioners on the issue of 'two cultures' and the perceived dichotomy between the natural and social sciences, which reaches right through to the need for interdisciplinary teaching at schools and universities.

Key messages

To conclude this report, the key messages arising from this synthesis study can be summarised as follows:

- Common pool resources (CPRs) are essential to the livelihoods of the poor, but their use by the poor is often contested or restricted. Developing sustainable, pro-poor CPR management regimes is critical to poverty reduction and maintaining environmental quality.

- An understanding of socioeconomic and institutional conditions governing current CPR use is a prerequisite for developing successful policy for CPR management.

- It is necessary to understand conflicting stakeholder perspectives and incentives in order to develop effective policy for CPR management. Simple and effective tools exist for evidence-based analysis and resolution of these conflicts.

- Social solutions are needed alongside technical solutions to help overcome conflict and ensure sustainable and equitable use of natural resources. This approach reduces pressure for commercialisation and privatisation, which tend to exclude poor people.

- Design of effective and sustainable CPR management needs to take economic costs and benefits into account. Easily applied models and methods of economic analysis have been developed to help create CPR management regimes that give positive returns.

- Property rights determine access to CPRs. The nature of these property rights affects productivity and levels of exploitation of resources. There is much to be learned from traditional management systems.

- The potential exists for a global–local transfer of benefits through implementation of international agreements such as the Kyoto Protocol and the Clean Development Mechanism, which can provide incentives for better CPR management.

- Local institutions for CPR management need to be strengthened to ensure effective and equitable engagement with national level policy makers, and to ensure implementation of pro-poor policy.

Communication outputs produced

For complete versions of the communication outputs produced from this study, refer to Annex B of this FTR.

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Appendix I – Project Summaries

This appendix contains the details of RNRRS project reviews carried out for this synthesis study according to the study's framework for analysis. Note that tables, figures and references in Appendix I are treated discreetly for each project summary. The following table lists the projects for which reviews were undertaken:

RNRRS Programme	Node Suite	Production System	Project code	Title
AFGRP	N/A	N/A	R7917	Self-recruiting species in aquaculture, their role in rural livelihoods
FRP	N/A	TMF	R5590	Sustainability of economic activities based on non-timber forest products
FRP	N/A	H 2	R6320	Sustainable community forest management and carbon sequestration in indigenous communities in Chiapas, Mexico
FRP	N/A	FAI	R6511	Enhancing the role of non wood tree products (NWTP) in livelihood strategies of smallholders in semi-arid Kenya
FRP	N/A	FAI	R6914	The economic analysis of stakeholder participation in participatory forest management (PFM)
FRP	N/A	FAI	R7374	Rural livelihoods and carbon management
FRP	N/A	N/A	ZF0165	Strategic researchable constraints for participatory forest management
FMSP	N/A	N/A	R6436	The performance of customary marine tenure in the management of community fishery resources in Melanesia
FMSP	N/A	N/A	R7334	The management of conflict in tropical fisheries
FMSP	N/A	N/A	R8467	Incorporating common pool resource (CPR) issues into fisheries management policy in developing countries
LPP	N/A	SA	R7432	Participatory development of community-based management plans for livestock feed resources in the semi-arid areas of Zimbabwe
NRSP	TC 3 - CPRs	FAI	R6386 & PD066	Review of common property rights, tenure and access rights in relation to land use management and planning at the Forest Agriculture Interface
NRSP	Ba	SEM	R6744	Indigenous knowledge and natural resources research: Bangladesh floodplains
NRSP	Ba 1	LWI	R6756	Investigation of livelihood strategies and resource use patterns in floodplain production systems based on rice and fish in Bangladesh
NRSP	Ba 1	LWI	R7562	Methods for consensus building for management of common property resources
NRSP	Ba 1	LWI	R8223	A learning and communications programme for the PAPD method
NRSP	Ba 1	LWI	PD131	The effectiveness of the PAPD method: a comparison of community organisation experience in the CBFM-2 project

RNRRS Programme	Node Suite	Production System	Project code	Title
NRSP	Ba 1	LWI	R8103	Consensus for a holistic approach to improve rural-livelihoods in riverine-islands of Bangladesh (CHAR)
NRSP	Ba 1 & 3	LWI	R8195	Integrated floodplain management - institutional environments and participatory methods
NRSP	Ba 3	LWI	R8306	Better options for integrated floodplain management - uptake promotion
NRSP	Ne 1	FAI	R6778	Community forestry in Nepal: sustainability and impacts on common and private property resource management
NRSP	Ne 1	FAI	R7975	Social structure, livelihoods and the management of CPRs in Nepal
NRSP	Ca 1	LWI	R6919	Evaluating the trade-offs between users of marine protected areas in the Caribbean
NRSP	Ca 1	LWI	R7408	Building consensus amongst stakeholders for management of natural resources at the Land Water Interface
NRSP	Ca 1	LWI	R8317	Pro-poor policies and institutional arrangements for coastal management in the Caribbean
NRSP	EA 2	H	R7856	Strengthening social capital for improving policies and decision making in NRM
NRSP	EA 3	SA	R7857	Review of common pool resource management in Tanzania
NRSP	EA 3	SA	R7150	A synthesis of two case studies where wildlife, tourism and pastoralism interact in Kenya
NRSP	EA 3	SA	R7304	Zimbabwe: micro-catchment management and common property resources
NRSP	EA 3	SA	R7973	Policy implications of common property resource (CPR) knowledge in India, Zimbabwe and Tanzania
NRSP	In 3	SA	R8280	Incorporating stakeholder perceptions in participatory forest management in India
NRSP	EA 3	SA	R8116	Improving management of common pool resources in rainwater harvesting systems
NRSP	EA 2	Cross-cutting	R8400	Advancing the use of the products of NRSP's past and current research projects in Eastern Africa
NRSP	Gh 1	FAI	R7577	Environmental policies and livelihoods in the forest margins of Brazil and Ghana
NRSP	Gh 1	FAI	R7957	Poverty dimensions of public governance and forest management in Ghana
NRSP	Gh 1	FAI	R8258	Informing the policy process: decentralisation and environmental democracy in Ghana
NRSP	PUI 2	PUI	R7867	Filling gaps in knowledge about the peri-urban interface around Hubli-Dharwad

RNRRS Programme	Node Suite	Production System	Project code	Title
NRSP	PUI 2	PUI	R7872	Renewable natural resource-use in livelihoods at the Calcutta peri-urban interface
NRSP	In 3	SA	R7877	Common pool resources (CPRs) in semi-arid India – dynamics, management and livelihood contributions
NRSP	In 3	SA	R7974	Human and social capital aspects of soil nutrient management, semi-arid India
NRSP	In 3	SA	R8192	Enabling rural poor for better livelihoods through improved natural resource management in SAT India
NRSP	In 1	HP	R8100	Investigating improved policy on aquaculture service provision to poor people
NRSP	In 1	HP	R8334	Promoting the pro-poor policy lessons of R8100 with key policy actors in India

AFGRP R7917 Self-recruiting species in aquaculture: their role in rural livelihoods

Project summary

This project investigated the role of self-recruiting species (SRS) in aquaculture in five countries in southern and south-eastern Asia. Fisheries are an important source of food and income for poor people. Because they cannot afford the infrastructure needed for stocked aquaculture, they rely on a harvest of aquatic animals from community water bodies and from ponds and rice fields. SRS are aquatic animals that can be harvested sustainably from a farmer-managed system without regular stocking. They include species such as fish, prawns, crabs and snails that exist in managed ponds, but do not represent the species of commercial interest to large pond owners. SRS are critical for poor people, both for home consumption and sale. Their importance varies seasonally. The catch in open-access water bodies, including flooded rice fields, is critical during the flood period, and during the dry season they provide food and income for poor families collecting them in ponds, ditches and as a by-catch from commercially operated ponds. At the end of the dry season, the presence of SRS in privately owned ponds is essential for quickly restocking communally accessed aquatic resources when the floods come. This AFGRP project used a combination of social and natural science techniques to measure the role of SRS in livelihoods, productivity and to investigate the biology of the species concerned. It was observed that SRS appear to enhance productivity in stocked ponds, and that by maintaining high levels of biodiversity in managed ponds by allowing sustained presence of self-recruiting species, positive economic returns for all community members could be gained from both stocked fish ponds and communal fisheries.

Level 1. Millennium Development Goals

MDG1. Fisheries are an important source of food and income for poor people. Because they cannot afford the infrastructure needed for stocked aquaculture, they rely on self-recruiting species (SRS), i.e. ‘wild’ stock. SRS provide both food and income for poor people from seasonal CPR water bodies.

MDG7. Environmental sustainability is enhanced by maintaining high levels of biodiversity in managed ecological systems. Self-recruiting species increase levels of biodiversity and are associated with positive economic returns from both stocked fish ponds and communal fisheries.

Level 2. DFID spending channels

Channel 1. The nature of the relationship between biodiversity and productivity is a major research question. The research carried out under R7917 not only points to an increase in ecological productivity, but also an enhancement of social sustainability.

Channel 2. The role of SRS in poverty mitigation is an important finding. Future research could explore further the role that management of stocked fish ponds plays in determining the level of SRS in the seasonal water CPRs.

Channel 3. The research is applicable to seasonally inundated areas of high human population where much of the key resources, such as fish ponds, are in private ownership. This is of importance in some areas of south Asia, such as Bangladesh, but is currently of lesser importance in Africa.

Level 3. Important project features and insights

- The project successfully applied a combination of social and natural science techniques to measure the role of SRS in livelihoods, measure productivity and investigate the biology of the species concerned.
- SRS provide 'win-win' benefits both to poor people, for whom they are critical for home consumption and sale, especially during the dry season when access to other water bodies becomes limited, and for owners of private stocked ponds as they enhance pond productivity.

References

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Project website: http://www.dfid.stir.ac.uk/Afgrp/projects/r7917/r7917.htm

FRP R5590 Sustainability of economic activities based on non-timber forest products

Project summary

It is widely argued that in the tropics non-timber forest products (NTFPs) can be as economically important as timber. This project collected information in Ghana to determine more accurately the development role of NTFP income and the nature of appropriate interventions in forest management, forest products and small enterprise programmes.

Level 1. Millennium Development Goals

Goal 1. Drawing on the results of a number of large surveys in different countries in Africa, the project demonstrates the importance of forests for poverty mitigation. Very large numbers of rural households in Africa continue to generate some of their income from harvesting products from forest CPRs. Gathering of forest products is part-time and by farm households that cannot raise enough food to be self-sufficient year round, illustrating the importance of forest products for mitigating poverty by providing an income safety net. A survey in six countries in eastern and southern Africa showed that 2.3% of rural populations and 0.8% of urban populations were gaining income from forest products. In the more heavily forested southern Ghana 10% of the rural population gained some income from forest products. In Africa south of the Sahara it is estimated about 15 million people could be engaged in forest product harvesting.

Goal 7. Improved forest management will contribute to environmental sustainability by maintaining ecologically intact forests and the flow of benefits derived from them. Loss of environmental resources will be prevented through controlling over-exploitation of forest resources, which are also often important cover for water catchments and so can contribute to the supply of safe drinking water.

Level 2. DFID spending channels

Channel 2. The study could be followed up by looking at the best way to manage forests so they act as a 'buffer' resource to mitigate poverty whilst developing other enterprises for poverty alleviation. This is a policy conclusion of the study, but data needed to verify this approach are not presented.

Channel 3. The study contains an analysis of the role played by forest products in household incomes in southern, eastern and western Africa, so provides useful baseline data for establishment of the regional programmes (see references in Arnold and Townson, 1998).

Level 3. Important project features and insights

- The study draws on the results of a number of large surveys in different countries in Africa.

- The importance of forest incomes for poverty mitigation lies in its timing as a means of filling seasonal or other cash flow gaps, e.g. to purchase seeds or hire labour.
- The large numbers of people involved show the ease of entry into forest product harvesting activities.
- Small forest product enterprises are prominent where there are dispersed rural markets and high transport costs protect against competition from urban supplies.
- Where people have had relatively unrestricted access to forests, forest product income is particularly important for poorer groups, but it is the wealthier groups who are the heaviest users, and they can capture control over the resource at the expense of the poor.
- The policy implications of this are that intervention strategies need to recognise a distinction between those extracting forest products because they lack alternatives, and those who are responding to market opportunities. The authors suggest that provision of new opportunities for the poor might be an appropriate way forward, and that forest management should not necessarily assume a need for forest product extraction.

References

Arnold, M. & Townson, I. 1998. Assessing the potential of forest product activities to contribute to rural incomes in Africa. *ODI Natural Resource Perspective* 37: 1-8.

FRP R6320 Sustainable community forest management and carbon sequestration in indigenous communities in Chiapas, Mexico

Project summary

The ability of most communities in Chiapas to implement sustained-yield management of their forest resources is prevented by lack of expertise. The project took measures to correct this deficiency at community level by personnel training, institutional development and introduction of appropriate planning methodology. Carbon sequestration activities were successfully implemented at village level in Mexico, showing it is possible to have a global to local benefit transfer if appropriate mechanisms are in place.

Level 1. Millennium Development Goals

Goal 1. The introduction of payments for carbon sequestration opens the possibility for poor people to capture the value of land management geared towards combating global warming. Potentially this is a 'win-win' approach with both environmental and social gains. The concern is, however, that it is more efficient to create large plantations specifically geared towards carbon sequestration, an approach which may have negative effects on the livelihoods of poor people. R6320 successfully implemented carbon sequestration activities at a village level in Mexico, showing it is possible to have a global to local benefit transfer if appropriate mechanisms are in place.

Goal 7. R6320 is a practical implementation of the ideas and concerns reviewed in R7374, and demonstrates the feasibility of integrating the principles of sustainable development into country policies and programmes by linking global policies of carbon offset trading with local level poverty alleviation.

Level 2. DFID spending channels

Channel 3. Lessons learned in the successful application of carbon sequestration at the village level could be transferred to the new regional centres in Africa and South Asia. The 'Plan Vivo' approach developed in Mexico is being applied in the Nhambita Community Carbon Project, Mozambique, and Trees for Global Benefit, Uganda.

Level 3. Important projects features and insights

There are two main issues addressed by FRP funded research into carbon sequestration. The first is mitigation of global warming through sequestration of carbon using forestry. The second is to implement carbon sequestration activities so that they provide social and economic benefit to poor communities in developing countries. If it works, this approach is a 'win-win' situation in that two key policy objectives are met.

- R6320 demonstrates that it is feasible to meet both objectives in a remote rural environment in Mexico.

- The scale and continuity of funding (more than six years of support) has been an important component in this success, and a key feature of the project is the creation of an effective operational structure at village level.
- However, there are some constraints:
    - Some silviculture options (notably the more biodiversity acceptable Oak/Pine treatment) have a negative rate of return.
    - Transaction costs are significant - particularly the monitoring costs to ensure that the contracted amount of carbon is actually being sequestered.
- The estimated average discounted net economic gains are $100/ha for the farmers over a 25-year period. If this estimate was extended to all future carbon sequestration work in the developing world, then it would yield additional funding in excess of $40 billion over a 50-year period and revolutionise support for developing countries. This assumes that all carbon sequestration in developing countries would be based on forestry, which may not be the case. However, even more conservative estimates represent significant potential for developing countries.
- The project findings are being used in further projects in southern India, Mozambique and Uganda (see www.planvivo.org/projects/projects.html).

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Website: http://www.planvivo.org/projects/projects.html

FRP R6511 Enhancing the role of non-wood tree products (NWTP) in livelihood strategies of smallholders in Semi-arid Kenya

Project summary

Quantitative data indicate that tree and forest resources are primarily important in supporting subsistence. Less than 5% of household income is generated through the sale of tree products. This project identified *Melia volkensii* and *Tamarindus indica* as having high potential for further processing and marketing. An innovative research methodology was developed that combines participatory and conventional techniques and which yields quantitative and qualitative data.

Level 1. Millennium Development Goals

MDG1. The extent to which tree products can enhance livelihoods depends on strengthening institutions, markets and communications. R6511 identifies two tree species, *Melia vokensis* and *Tamarindus indica*, which have the potential to add value and generate incomes for rural households, but highlights the fact that, in Tharaka, Kenya, support is required for smallholders to enhance the role of tree products in their livelihoods.

MDG7. This study has shown that the development of markets for tree products could encourage investment in on-farm tree planting as well as the conservation of existing trees. The argument is that direct benefit flows to farmers encourage conservation and sustainable use of tree resources. Comparisons between Machakos District, where there is access to markets, and Tharaka, where there is not, showed that markets can create conditions for on-farm intensification through tree planting and changes in attitudes to off-farm trees and woodlands.

Level 2. DFID spending channels

Channel 3. This research has covered a number of aspects of tree use, values, existing and potential markets. There is potential for this methodological approach to be applied more widely to semi-arid regions in the DFID regional centres in Africa and South Asia to investigate the existing and potential markets for tree products.

Level 3. Important project features and insights

The findings of R6511 make a significant contribution to knowledge and understanding in three key areas of natural resources and development studies.

- **Role of tree products in rural livelihoods.**
  Rural livelihoods are vulnerable in semi-arid Kenya, hence diversification is widespread. However, opportunities for income generation are severely constrained with limited access to markets. Local markets are poorly developed with variable volumes, vendors and prices.
  Tree products can be important income sources, although on average they only provide a small fraction of household income (4.4%), they contribute to the incomes of over 80% of households.

Tree products and marketing are often last resort activities in which people engage when there are no other sources of income available. There may be little opportunity for adding value, but the low capital and skills required means that entry into these activities is relatively easy.
More sustainable activities will require greater capital and skills, and the ability to sustain market share.

- **Incentives for conservation and sustainable management of trees and forest biodiversity.**
  Forest reserves provide both use and non-use/existence values. The total economic value (TEV) of the reserve in Tharaka is over 10 million KSh per annum. Farmers make use of trees and are planting and conserving trees both on-farm and off-farm. With greater information, market opportunities, technical advice, credit, and appropriate collective action, trees and tree products could make more of a contribution to livelihoods. However, there are changing attitudes, with the young more likely to value trees as a means of generating incomes, which has implications for conservation of remaining woodlands. Therefore, this research has identified useful tree species which are compatible with existing farming practices but allow income generation and some intensification of land use.
  Current policy such as the new Forest Act could encourage the conservation of trees and forests by facilitating better flows of benefits to farmers. This needs a proactive approach, including strengthening the markets for tree products.
- **Participatory valuation and environmental economics methodology**
  This research uses a variety of techniques, including conventional survey and participatory approaches, generating qualitative and quantitative data. Through combining approaches, the research sought to overcome the limitations of using single approaches as well as to triangulate and verify data yielded by different methods.

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Brown, K., Emerton, L., Maina, A., and Mogaka, H. 1999. *Enhancing the role of non-wood tree products in livelihood strategies of smallholders in semi-arid Kenya. Final Technical Report for FRP project R6511.* 196pp. Norwich, UK: Overseas Development Group (ODG).

FRP R6914 The economic analysis of stakeholder participation in participatory forest management (PFM)

Project summary

It is widely recognised that tropical forestry without participation is normally unsustainable. Experience shows that lack of information on costs and benefits to different stakeholders limits the ability of projects to identify incentives necessary for effective participation. Socioeconomic impact assessment has also been weak. These problems are partly due to the lack of appropriate economic methodologies for use throughout the project cycle. Based primarily on a literature review and four field case studies, this project produced a manual 'Stakeholder Incentives in Participatory Forest Management' (Richards *et al*. 2003b) containing a toolbox of economic methodologies to help practitioners use economics in participatory forest management.

Level 1. Millennium Development Goals

MDG 1. Any long-term success of poverty alleviation efforts must be based on sound economic principles. These are that benefits must outweigh costs. Richards *et al.* (2003a) state that the reasons for the 'high failure rate of rural development forestry projects is the weak economic incentives for local forest users and other stakeholders to participate in sustainable forest management. In view of the high dependency of the rural poor on forests for their livelihoods, this has serious poverty implications.'

MDG 7. Environmental sustainability depends on projects being self-sustaining. Projects involving access to CPRs need to be designed so that they contain appropriate incentives and look at the costs and benefits of alternative livelihood and land use options. The project has produced a 'toolbox' manual (Richards *et al*. 2003b) to help practitioners use economics in participatory forest management.

Level 2. DFID spending channels

Channel 2. The manual (Richards *et al*. 2003b) can be used in a wide range of projects. For example, projects concerned with carbon offsets (see FRP R7374 and FRP R6320) would benefit from the application of economic tools. The tools are also applicable to many other natural resource CPR projects in addition to those concerned primarily with the forest sector.

Channel 3. The manual and application of economic methodology will be useful for new research in the regional centres. One of the criticisms of participatory methods – which are fundamental in CPR research because of the large number of stakeholders – is a lack of 'hard science'. Use of appropriate economic methods can go some way to answering this criticism. However, some training in the application of basic economic principles may be necessary if people implementing the methods do not have a background in economics. This might require some capacity building before the project outputs can be fully utilised.

Level 3. Important project features and insights

CPR projects based on participatory methods meet the important requirement of community involvement, but without an appreciation of economic considerations they can be unsustainable. To be self-sustaining a project needs to generate more benefits than costs, otherwise it is doomed from the outset. However, economic studies can be expensive and time consuming.

- The project points out the problems of conducting economic analyses, particularly when the respondents are not numerate or literate. It suggests that the sequence of research methods is very important, starting with participatory methods and then leading into economic data gathering and analysis:
  a) Participatory research assessment to build an understanding of the household economy, stakeholder objectives, livelihood choices, constraints, production systems, temporal and gender variation, as well as estimates of labour inputs and other costs;
  b) Key informant discussions to triangulate the main costs, labour inputs, temporal variation, and for developing farm or household economic budgets;
  c) A household survey of production, sales, consumption levels, off-farm employment, cash income, expenditure.
- The project stresses that every situation is different and application of the methods depends on the objectives of the research.
- An important stage that is often ignored in economic analysis is the return of data to stakeholders in an accessible form.
- Some capacity building will be needed if researchers do not have a background in economics, as it was clear from the case studies that 'appropriate application of economic tools, especially in the valuation and comparative economic analysis stages, requires experience, imagination and a firm grounding in economic theory' (Richards *et al*. 2003a). For example, values of labour or products are often not represented in the market, so shadow pricing is necessary. This requires a certain amount of skill and imagination.
- The project also stresses that economic analysis does not result in decisions, but rather provides information and criteria for decisions makers.

References

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FRP R7374 Rural livelihoods and carbon management

Project summary

Project R7374 examined the implications of carbon offsets for developing countries, and in particular the rural poor and landless. A review of experience of carbon offsetting to date raises key questions about the real added value of carbon offsets, the impact of carbon offsets on rural livelihoods, and whether rural people can really benefit. The key conclusion was that carbon offsetting can integrate global needs with local livelihood requirements. However, only with appropriate policies, institutions, community mechanisms and project procedures will carbon offsetting help rural development.

Level 1. Millennium Development Goals

MDG 1. There is a very real concern that high-level policies for carbon offset trading could result in large areas of land being alienated for forestry plantations. This will have two major effects on poor people. Firstly, land will be alienated, and secondly fast-growing exotics suitable for rapid carbon sequestration will provide few minor forest products that can generate income for poor people. Stronger local organisation and security of tenure are identified as key factors needed to allow rural people access to carbon offset markets.

MDG 7. R7374 tackles a policy dichotomy – the conflict between management of the global and local commons. On one hand, environmental sustainability and sustainable development will be enhanced by increased carbon sequestration and the subsequent mitigation of global climate change. On the other hand, commercial carbon offset plantations could have a negative effect on the rural livelihoods of poor people. Even where rural people are able to access carbon offset markets, they should not be seen as a panacea for sustainable resilient livelihoods.

Level 2. DFID spending channels

Channel 3. The project puts forward a series of challenges and potential roles for development assistance that involve promoting synergies between carbon management and other policy processes. The overarching research question is: how can poor people benefit from carbon offset trading? The question can then be broken down into the many aspects of the relationship between livelihoods and CPRs, many of which are reviewed by the project. The research is relevant to areas where land is available, and affordable, and for the creation of carbon offset schemes in rural areas of southern, eastern and western Africa with reasonable rainfall.

Level 3. Important project features and insights

The project is a review and so does not undertake original empirical research. It provides an extensive overview of relevant literature and assembles a considerable body of data. Suggestions are made for the types of rural development and forestry projects that make good livelihoods for three types of carbon offset projects (Table 2.5 in the report):

Carbon Project Type	Look for 'forestry/rural development that works' in…
Carbon conservation	• 'People and protected areas' projects • Agricultural intensification • Rotational shifting cultivation • Community fire control schemes • Home gardens • NTFP production • Eco-tourism
Carbon sequestration	• Community/farm/outgrower plantations • Forest rehabilitation or restoration • Agroforestry
Carbon substitution	• Community fuel wood • Community farm fuel wood • Charcoal production

References

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FRP ZF0165 Strategic researchable constraints for participatory forest management

Project summary

This e-survey and panel discussion on strategic problems in participatory forest management (PFM) followed previous FRP operational and programme development projects R7477, ZF0118, ZF0160, and ZF0164. It is linked to R8101 (Understanding and improving Participatory Forest Management (PFM) implementation strategies for enhanced livelihood impacts in India and Nepal). Nearly 300 people contributed to the discussions. The survey concluded that general PFM principles were well accepted and understood at international level. However, high turnover of field staff and the continued failure of some authoritarian government land managers to concede real decision-taking power to local communities mean that there is a continued need for:
• training of regulatory and extension staff and forest user groups;
• more and better locally-specific field manuals on best practice;
• syntheses on what kinds of PFM are most appropriate for what circumstances;
• resolution of inequities which remain in sharing of responsibilities and benefits in ethnically and gender diverse user groups;
• investigation of what donor interventions are most appropriate at the beginning of PFM projects, and for their continued support.

Level 1. Millennium Development Goals

MDG1. Forest CPRs play a key role in mitigating poverty, and the researchable constraints of participatory management identified in ZF0165 point the way to developing a research programme that will lead to more effective management.

MDG7. Environmental sustainability and integration of the principles of sustainable development into policy are enhanced by improved participatory management of forest CPRs.

Level 2. DFID spending channels

Channel 1. Through a wide consultation, the project identifies a range of research areas considered to be of importance. This could be used to guide investment in ‘blue skies’ research effort.

Channel 2. Areas of research considered to be of importance by the groups consulted could be used to validate proposals for supporting continuation of existing research.

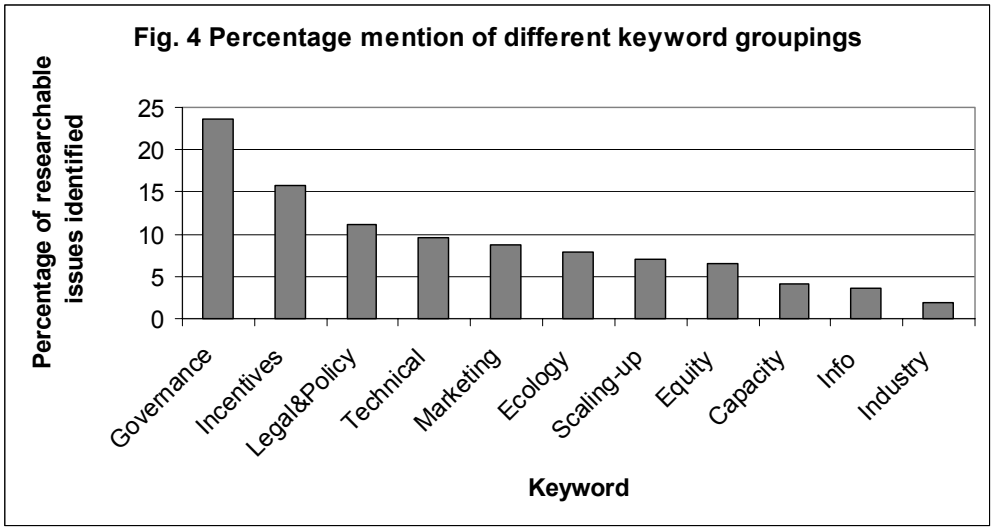
Channel 3. The areas of research considered to be important could be used to guide investment in new research in the regional centres.

Channel 4. The wide consultation identifies broad areas of interest that could be promoted in CGIAR research agendas.

Level 3. Important project features and insights

The project undertook a wide consultation to identify key researchable constraints in participatory forest management. The consultation consisted of an electronic survey of 700 members of the Rural Development Forestry Network (December 2001, 126 respondents), which was compared with three previous consultations.

- There was a general agreement between the different consultations on key areas of research.
- The main research issues were categorised into 11 keyword groupings (Table 4 from the report, reproduced below). Governance was most prevalent, followed by incentives and legal and policy issues.
- The specific research questions that the study recommended for attention are:
    - What are the institutional structures and processes that characterise successful PFM and, conversely, what lessons can be learned from unsuccessful PFM experiences?
    - How can lessons on institutional structures and processes that characterise successful PFM be scaled up and across to succeed in different financial, political and ecological contexts?
    - What tools and generic frameworks can be used for the assessment of impact and outcomes of different PFM implementation strategies?
    - How can key incentives for involvement in PFM (over different time scales and spatial levels, and for a variety of stakeholders) be identified, developed and communicated?
    - What international lessons on 'new' products of PFM can be applied to improve local level understanding of technical forest management?
    - How can effective and locally appropriate extension and dissemination methods and systems be developed that could channel existing knowledge, create conditions in which knowledge can be generated, and link with adaptive research methods?



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FMSP R6436 The performance of customary marine tenure in the management of community fishery resources in Melanesia

Project Summary

There has been considerable interest in the potential of community-state partnerships as a means of attaining a more effective management of widely dispersed, small-scale artisanal fisheries. One approach may be to combine the best components of a traditional, or customary, marine tenure system, with appropriate intervention and advice from the state. It has been assumed that customary management activities are beneficial, both to the community and in terms of the sustainability of natural resources.

The purpose of this project was to describe and evaluate the performance (social equity, and ecological sustainability) of a number of extant CMT regimes in Fiji and Vanuatu, and to identify ways in which co-operation with government (co-management) could enhance the current system.

Level 1. Millennium Development Goals

MDG1. Fisheries in the Pacific region represent an important source of livelihood for coastal communities. The development of co-management of fisheries resources in these areas could lead to poverty reduction through improved livelihoods.

MDG7. The project identified activities within customary management that could be appropriate to sustainable management objectives. Support for adaptation of customary management could therefore go some way to achieving MDG7 in the region.

Level 2. DFID spending channels

Channel 2 and 3. Some of the outcomes from this project have relevance for other CPR systems, such as rangelands in East Africa. Therefore, this project could be used to inform research on customary management in other regional centres.

Level 3. Important project features and insights

There were a number of key outcomes from this project.

- In neither Fiji nor Vanuatu do Customary Fishing Rights Area (CFRA) boundaries relate to the underlying distribution of the fisheries stocks. CFRA demarcation and use was defined according to wider political and social attributes of the system.
- There was a considerable range of equity outcomes observed. In the small communities of Vanuatu, which display a greater degree of ethnic and economic homogeneity, equity was generally achieved. Co-operation between stakeholder groups across adjacent CFRA units was universal, and sharing of marine resources across time was the norm. In contrast, in Fiji equity was variable. In sites where commercial fishing pressure was significant, equity was a rare commodity.

- There is little evidence of customary management being successful in managing resources for long-term benefits related to ecological sustainability. However, there are some management actions that exist which could be adapted to achieve sustainability.

Extant CMT systems show a degree of flexibility to changing endogenous and exogenous conditions, and there is potential to develop resource management strategies mutually acceptable to fishing communities and national government, based on the concept of co-management.

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FMSP R7334 The management of conflict in tropical fisheries

Project summary

Most research on natural resource conflicts in general, and fisheries conflicts in particular, has concentrated on site-specific violent conflicts (shrimp wars in Kerala, for example) and has assumed that resource allocation is the primary issue. But is this always the case? Many fisheries conflicts over gear use, landing site rules or market behaviour are not primarily about resource allocation, but are rooted in more complex institutional issues such as cultural differences and political power struggles. What is more, fisheries conflicts rarely result in violence, yet we know little about how such conflicts emerge or how they are managed. Conflict is not necessarily negative: conflicting agendas and ideas can be part of an iterative process of institutional change and evolution. But when the costs of conflict begin to outweigh the benefits, and the attention of policy-makers and managers is detracted from the important welfare functions of the fishery (providing a source of income and nutrition for example), conflict can become a negative force. By understanding why and how conflicts in fisheries develop and how managing them might be improved, fisheries in tropical developing countries can continue to supply a sustainable flow of benefits and support some of the world's poorest producers.

To improve the level of understanding of tropical fisheries conflicts, this project carried out a study to establish the level of conflict in tropical fisheries, what institutions (formal and informal) existed to manage conflict, how well the stakeholders considered conflicts to be managed, and what improvements could be made.

Level 1. Millennium Development Goals

MDG1. The poor feel the impact of conflict more readily as support mechanisms are eroded. The higher the levels of poverty, the greater the potential for conflict as fishers compete to capture scarce resources to meet growing financial difficulties. Identifying the drivers of conflict and improving institutional capacity to deal with conflict are therefore important to achieving MDG1.

Level 2. DFID spending channels

Channel 2. This project devised a unique framework to research and analyse conflicts. The research framework drew on previous work in institutional economics, transaction costs and institutional failure. Although the method was developed in Ghana, it was flexible enough to adapt to each of the other countries. This framework presents and interesting new methodology, which could be applied to research on conflict and conflict management in a wide range of CPRs.

Level 3. Important project features and insights

Principle Research findings:

- The number of conflicts may not be rising, but the poor are feeling their impact more keenly as support mechanisms for dealing with conflict are eroded.

- The majority of conflicts reported were over lack of enforcement and misadministration by formal fisheries institutions.
- While on the surface NR conflicts may appear to be over allocation issues, the root cause of the conflict is often far more complex. Conflict is very often a result of institutional failure to mediate conflicting needs and perceptions.
- Conflicts caused by external agents (vessels from other ports and bandits for example) are harder to resolve and potentially more damaging than locally-based conflicts.
- The capacity of informal fisheries management institutions and the degree of support or recognition they receive from the state are key to understanding why fisheries conflicts emerge and how well they are managed.
- There is an intuitive link between poverty and conflict: the higher the levels of poverty, the greater the potential for conflict as fishers compete to capture scarce resources to meet growing financial difficulties.

Principle Policy lessons:

- For effective conflict management, fisheries managers need to be aware of the 'layering' of conflicts and be able to trace them back to the real rather than the apparent cause. This requires training in conflict awareness and assessment.
- Training on conflict assessment, conflict management and resolution techniques need to be introduced as part of basic training for Fisheries Officers working with fishing communities. Fisheries Administrators and Managers working in Government Offices also need training to raise awareness of the impact of conflict in the sector.
- Conducting a 'conflict audit' prior to undertaking project activity in fisheries would help to establish the 'state of play' in the fishery and prevent current problems being compounded.
- Policy-makers and Fisheries Officers often see conflicts in a very different light to fishers. The former will often only be aware of conflicts that are taken to court for arbitration (net entanglements, vessel collisions, violation of gear usage rules). The latter, however, often consider a much broader range of issues as conflicts (access arrangements, how the fishery is controlled and by whom). Confining management and policy initiatives to those conflicts that appear on the 'official' system and are recorded in court transcripts and police records will fail to deal with some of the important long-term problems at the local level.
- Good conflict management requires the active participation of all stakeholders. In many countries this will require institutional capacity building at all levels to ensure that all stakeholders are able to participate.
- In the long term, tackling poverty in fishing communities and addressing entitlement issues would address many of the fundamental problems that result in conflict.

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FMSP R8467 Incorporating common pool resource (CPR) issues into fisheries management policy in developing countries

Project summary

Fisheries are important economically and socially, at global and national levels, and help underpin the livelihoods of millions of mainly rural (often poor) people in developing countries. The aim of the project was to identify and promote new knowledge and understanding about the nature, exploitation and management of fisheries CPR in developing countries.

Level 1. Millennium Development Goals

MDG1. The key role that fisheries play in the livelihoods of poor people in developing countries means that the uptake and implementation of the approaches for improving CPR management performance identified in this project will contribute to MDG1.

MDG1. Although not mentioned explicitly in the project documents, successful CPR management requires the sustainable management of fish stocks to provide long-term benefits.

Level 2. DFID spending channels

Channel 2. This project has identified two key areas where follow up on this research could occur: in identifying and implementing approaches to improve CPR management, and in the research priorities for future fisheries management.

Level 3. Important project features and insights

Knowledge on people-fisheries relationship:

- Some people are completely dependent on fisheries because they have few other opportunities.
- Fisheries can also form one part of a diverse portfolio of household livelihood strategies.
- In many countries CPR fisheries are governed by a complex mosaic of institutions and management systems, often involving state and local level arrangements.
- The wider context of CPR fisheries is changing rapidly (e.g. globalisation of markets).

Factors effecting CPR management performance

- Information, knowledge management and decision-making capacity
- Stakeholder participation in the policy process and fisheries management
- Property rights, responsibilities and incentives
- Institutions and organisational development
- Political will and change

Approaches to improving CPR management performance

- Managing information and applying knowledge
- Encouraging participation
- A basis of legal property rights
- Creating appropriate institutions and organisations
- Political will and changes in governance

Future research priorities for fisheries management:
- Information systems and communication for policy and management decision-making
- Livelihood analysis, poverty and development pathways
- Policy analysis, political-economy and governance
- Fisheries management approaches and planning
- Operationalising new approaches to fisheries management

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LPP R7432 Participatory development of community-based management plans for livestock feed resources in the semi-arid areas of Zimbabwe

Project summary

This participatory research project sought to assist communities in the Muzarabani District of Zimbabwe to define their management objectives with regard to their common pool vegetation resources. In particular it aimed to help communities visualise the trade-offs between various uses of their natural resources with a focus on livestock feed supply. Local knowledge was linked with formal scientific measurements to produce a common understanding of vegetation dynamics. Computer simulation modelling and role-playing was used to investigate the long and short-term impacts of community management strategies, and to identify effective institutions for the implementation of best management strategies from a local perspective.

Level 1. Millennium Development Goals

MDG1. Livestock are an important part of the livelihoods of households in semi-arid Zimbabwe. Common pool vegetation resources are key to pastoral strategies. The aim of project R7432 was to enhance the well-being of residents in Mahuwe ward through improved management of grazing CPRs. This was pursued through participatory techniques to identify management objectives and strategies for implementation in order to design management plans, enhancing the capacity of local managers. As such, the project contributes to MDG1 by improving resource management and thus improving the security of livelihoods.

MDG7. The effect of this project approach has implications for sustainable use of resources. Identifying and reaching consensus on management objectives and how best to achieve them leads to institutional strengthening and flexibility in the face of declining macro-economic conditions and local population increases. The focus of capacity-building research will be a slow process, but one that has the potential to produce sustainable production systems in the developing world.

Level 2. DFID spending channels

Channel 3. The novel methodological approaches used in this project, particularly the application of modelling as a way of clarifying problems and assisting communication between stakeholders, has the potential for more widespread use in the regional centres of Africa and South Asia as a tool for improving resource management in semi-arid regions. Different modelling approaches have already been tested in Zimbabwe (Bayesian networks) and Senegal (agent-based modelling).

Level 3. Important project features and insights

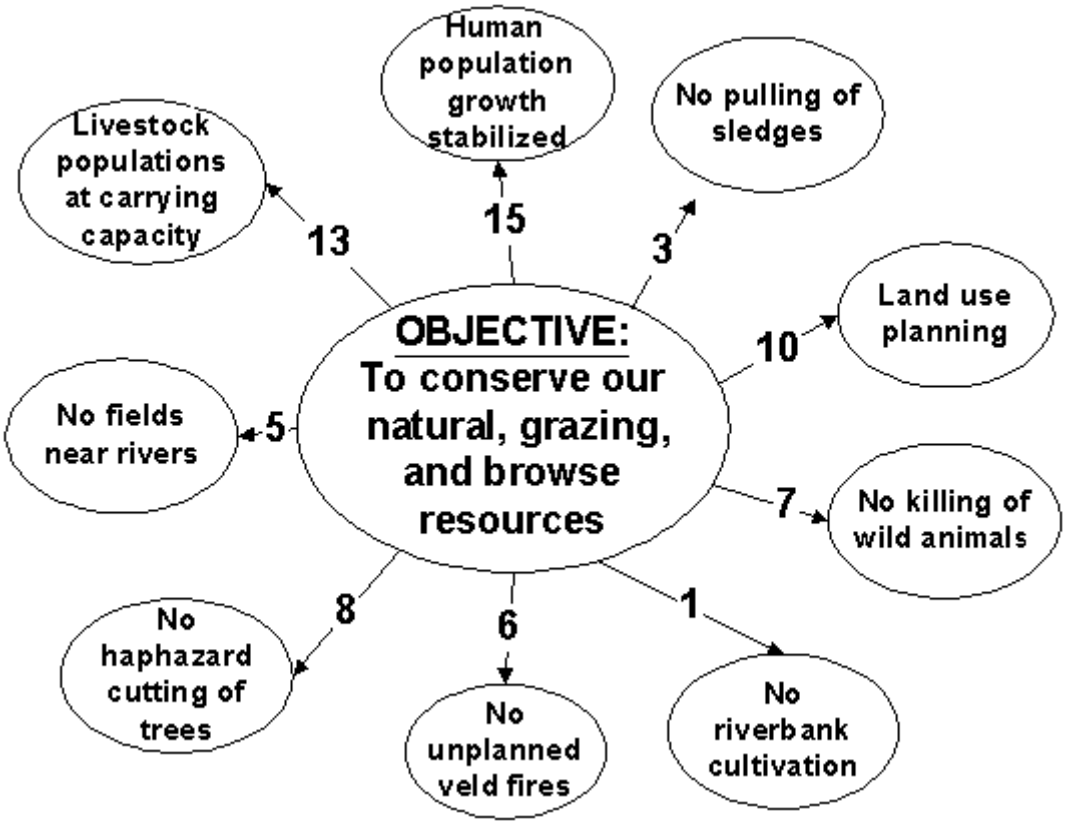
- Adaptive management is a 'learning by doing' process that involves:
    - *Problem formulation* (including needs analyses and setting system objectives);

- *System understanding* (including modelling the system to locate key leverage points or to identify optimal activities or designs as well as the selection of actions to be taken);
- *Action* (those activities undertaken to achieve the objectives);
- *Monitoring and evaluation* (including all observations and evaluation of system performance in achieving objectives); and
- *Updating.*

- Modelling techniques are often used for system understanding by providing a common representation of the problem situation, which can be manipulated. In Zimbabwe the model was developed with local stakeholders, which gave them a sense of ownership. The key management objectives were identified:
  1. To conserve natural, grazing, and browse resources
  2. Residents to appreciate the importance of wise use of natural resources to benefit future generations
  3. For future generations to learn from these resources

  These broad objectives were divided into sub-objectives (see figure 1). Participants were then able to define these sub-objectives and to define what factors affected their achievement.
- Participants identified increases in human and livestock populations as the major cause of decline in available goods and services, specifically through conversion of grazing resources to arable land. This has led to pressure and direct action from within the community to clarify who local leaders are and what role they could legitimately play in land allocations.

Fig. 1. Sub-objectives associated with the community objective of resource conservation and their associated importance scores.



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NRSP R6386 and PD066 Review of common property rights, tenure and access rights in relation to land use management and planning at the Forest Agriculture Interface

Project summary

This project aimed to identify and prioritise key researchable constraints with regard to common property issues and rights of tenure and access in land use management and planning at the Forest Agriculture Interface. The key issues for further research identified by the project included the development of more supportive policy and legislation, strengthening of local institutions and capacity building, and improving equity in management at the forest agriculture interface.

Level 1. Millennium Development Goals

MDG1 and MDG 7. All CPR-related research should, by its very nature, contribute to both MDGs. This project, as a forerunner in NRSP CPR research strategy, restates some of the key characteristics of CPRs. Subsequent NRSP research has endeavoured to address these key issues in the forest-agriculture interface (FAI):

- Common property ownership is the most egalitarian way in which to manage resources. Privatisation of CPRs has led to increased inequalities as the more powerful and influential are able to secure more of the commons as private property for themselves. (MDG1)
- Common property management is the most efficient way of managing certain resources, for example rangeland with limited seasonal water sources. Maximising production is not always the user's main aim. Reducing or spreading risk is often important, together with the presence of a safety net in times of hardship.

Level 2. DFID spending channels

Channel 2. NRSP has made a positive contribution to FAI CPR research, from the early identification of broad themes for further research in 1997 (**NRSP R6386**) to providing answers to key researchable questions in 2005.

DFID will be able to demonstrate to others that through its research it has refined and progressed the topic area to its current state, focussing on issues such as participatory forest management (and the contribution NRSP is currently making there), enhanced learning about differences in stakeholder perceptions and sources of conflict over participatory forest management, and how these findings are being used by key stakeholders and policy makers to generate more inclusive forest management policy.

Level 3. Important project features and insights

- The value of this project is not so much in its findings, but as an indicator of where NRSP FAI CPR research began and how far the research has come.
- Project R6386 and the NRSP Research Advance output (**NRSP PD066**) were the precursors to much of the NRSP FAI CPR research to follow.

- The purpose of the project was to identify and prioritise the key researchable constraints with regard to common property issues, and rights of tenure and access, in the FAI.
- PD066 (NRSP Research Advance No. 3) gives the reader a useful account of the state of FAI CPR research at the time (1997). Looking back, it is obvious to see how the focus of research, particularly NRSP research, has progressed.
- NRSP has made a contribution to FAI CPR research from the broad and open-ended key issues for future research (see below) identified in R6386 through to more recent projects in India and Nepal (**NRSP R7974** and **NRSP R8280**), which aim to answer some of the key issues identified early on the programme's life.
- R6386 key issues for future research:
    - Systems to encourage and monitor sustainable management
    - Development of supportive policy and legal frameworks
    - Strategies for re-orientation and strengthening the capability of forestry institutions (see **NRSP R8280** - Incorporating stakeholder perceptions in participatory forest management in India)
    - Development of balanced interdependence between farming and forestry systems
    - Articulation of CPR management systems with formal state systems
    - Improving equity with regard to socioeconomic groupings, gender and intergenerational aspects (see **NRSP R7975** - Social structure, livelihoods and the management of CPRs in Nepal)

Subsequent NRSP research has made a significant contribution to address the researchable constraints above, in particular issues 3 and 6.

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NRSP R6744 Indigenous knowledge and natural resources research: Bangladesh floodplains

Project Summary

The purpose of this project was to develop a methodology for accessing, understanding and using local natural resource users' indigenous knowledge in order to enhance technology developments. This was achieved by the development of a methodology for incorporating indigenous knowledge into natural resources research in a Land Water Interface systems project, by development of a holistic model of livelihood strategies of poor producers, and by the establishment of an informal network in Bangladesh for exchange of indigenous knowledge on local natural resource management practices.

Level 1. Millennium Development Goals

MDG1. While the project does not directly contribute to millennium development goal 1 since there were no direct benefits for primary stakeholders, uptake of the research outputs should make a contribution in the longer term through the development of indigenous knowledge informed research and knowledge sharing through the informal network.

Level 2. DFID spending channels

Channel 2 and 3. This project (in conjunction with R6756) represents the beginning of a series of projects designed to develop methodologies for natural resource management in the Land Water Interface system in Bangladesh. As such, it provides evidence of long-term investment in research in the South Asia regional centre, and a rich source of information and capacity building that could be exploited through further targeted research and development in the region.

Level 3. Important project features and insights

- The project found that natural resource users were willing to share their indigenous knowledge, but care needs to be taken to ensure that different stakeholders' constraints and perspectives on natural resource management are taken into account.
- Informal networks can be highly successful in disseminating knowledge and facilitating knowledge transfer. However, consideration needs to be made of how to make such networks self-sustaining once the initial projects have been completed.
- There are difficulties in attaining integrated research between projects working concurrently. The timing of projects is important for sharing results and will depend on the overall research purpose.

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NRSP R6756 Investigation of livelihood strategies and resource use patterns in floodplain production systems based on rice and fish in Bangladesh

Project summary

This project aimed to understand and incorporate interrelationships between competing commodity production systems into systems management strategies. This was achieved through the production of a robust and detailed characterisation of the complex livelihood strategies of the Bangladesh floodplain and the identification of alternative management strategies.

Level 1. Millennium Development Goals

MDG1. CPRs are often characterised by complex biophysical and socio-cultural interrelationships between competing resource uses. R6756 focused on understanding these relationships in the context of the competing and intimately associated practices of agriculture and fisheries on the floodplains of Bangladesh, both of which are central to the livelihood strategies of the poor there. The project developed an integrated biophysical and socioeconomic systems framework that could explicitly demonstrate the potential trade-offs, side-effects and points of tension resulting from single sector or narrowly focused policy interventions. In association with R6744, a methodology was also developed for the local interpretation of natural resources management and decision making by the different producer groups.

MDG7. Pro-poor CPR management requires the resource base to be maintained in the long term. The systems-based framework developed by R6756 enables informed policy decisions that increase the environmental sustainability of natural resource management.

Level 2. DFID spending channels

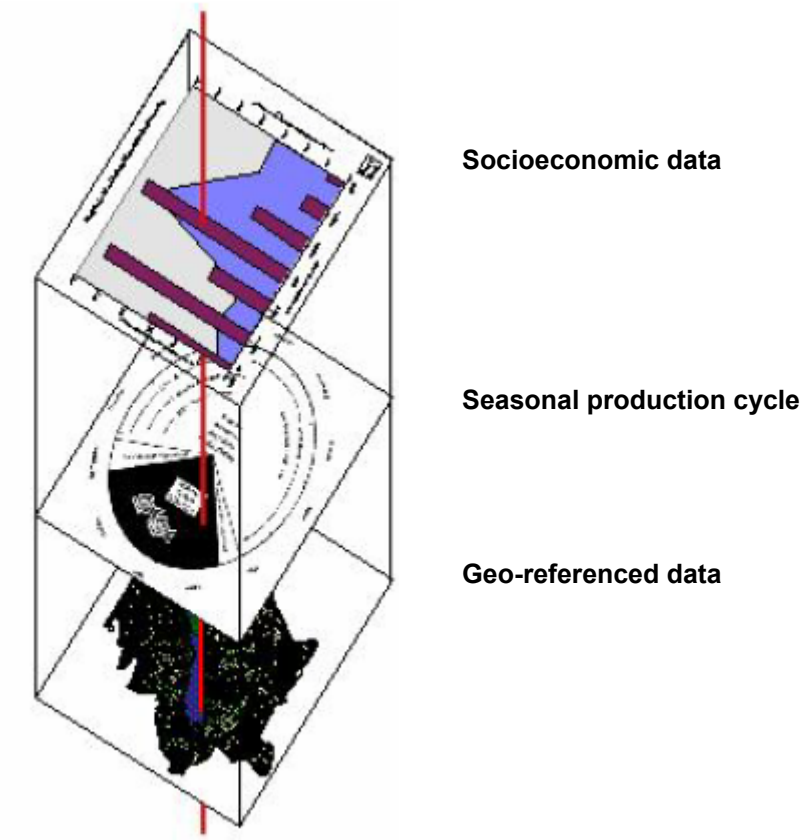
Channels 2 and 3. There is considerable potential to apply the systems-based framework developed by R6756 in other country and resource contexts. For example, for the understanding of competing resources uses between pastoralists and agriculturalists in semi-arid production systems. The methodology developed for local interpretation of natural resource management and decision making also has a great deal of potential for broader application in other research contexts.

Level 3. Important project features and insights

R6756 made significant contributions of relevance to contemporary CPR research in situations where CPRs are characterised by competing and complex interrelated usage patterns. Key outputs included:

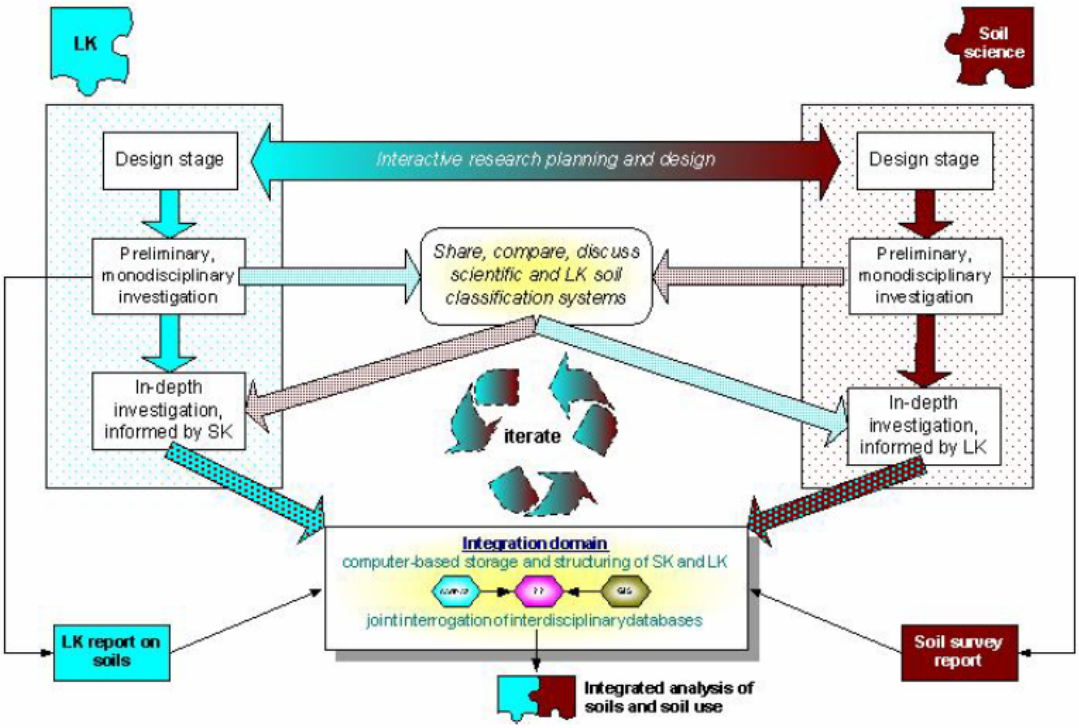
- The development of a systems-based framework for evidence-based analysis of potential trade-offs, side-effects and points of tension resulting from single sector or narrowly focused policy interventions (Figure 1).
- The field applications of the methodology developed by R6744 for local interpretation of natural resource management and decision-making (Figure 2).

Figure 1. Systems framework for modelling natural resource use



This framework incorporates dimensions of natural resource use to characterise production systems in relation to their defining spatial, temporal and socioeconomic factors. The framework allows multiple layers of different types of data to be queried, linking them according to points in time or space or socioeconomic status. Source: Barr (2000).

Figure 2. Idealised methodology for integrating scientific and local knowledge of soil resources.



The methodology for incorporating IK into NR research was developed through close association between natural scientists (essentially operating under R6756) and anthropologists (essentially operating under R6744). The methodology is in three parts:

i) Definition of Indigenous Knowledge (IK), review of IK in the context of the participation movement, and justification for incorporating IK in development programmes

ii) Consideration of the practical issues and trade-offs in design and management of projects that incorporate IK (this provides the main link to R6756)

iii) Toolbox of methods and techniques for collection of IK

The second part characterises NR projects that aim to incorporate IK according to the time and resources available for the IK component, and its scope (systems-wide IK or narrow, technically focused IK). Each of these factors defines a set of possible inputs (such as staff) and tools that can be used in the IK methodology. For example, a project with limited resources and of limited IK scope, but abundant time, could employ a postgraduate anthropologist who would use ethnographic methods. The trade-offs might, however, include lack of expertise in the culture of the project area and lack of familiarity with the relevant NR topics. This assessment is presented in a series of SWOT matrices. Source: Barr (2000).

References

Barr, J. J. F. 2000. *Investigation of livelihood strategies and resource use patterns in floodplain production systems based on rice and fish in Bangladesh. Final Technical*

Report for NRSP project R6756. Newcastle: Centre for Land Use and Water Resources Research.

NRSP R7562 Methods for consensus building for management of common property resources

Project summary

This project tested, refined, and promoted methods for community participation in integrated sustainable management of terrestrial and aquatic floodplain resources. It tested the consensus building ability of the PAPD methodology at four field sites, alongside a review of other consensus building and CPR management projects. The project found that the PADP methodology can build social capital, and its promotion to and uptake by a wider audience was successful.

Level 1. Millennium Development Goals

MDG1. CPRs are often characterised by complex biophysical and socio-cultural interrelationships between competing resource users. R7562 tested consensus building methodologies to enable sustainable management of CPRs, and created a typology of methodologies and a decision-tree to guide managers of CPRs in their application. The successful development and implementation of consensual CPR management is integral to ensuring that the needs of the poorest and most marginalised users are recognised.

MDG7. The consensus building methodologies tested and refined by R7562 enable conflicting CPR uses to be addressed, and consensual, environmentally sustainable management approaches to be developed.

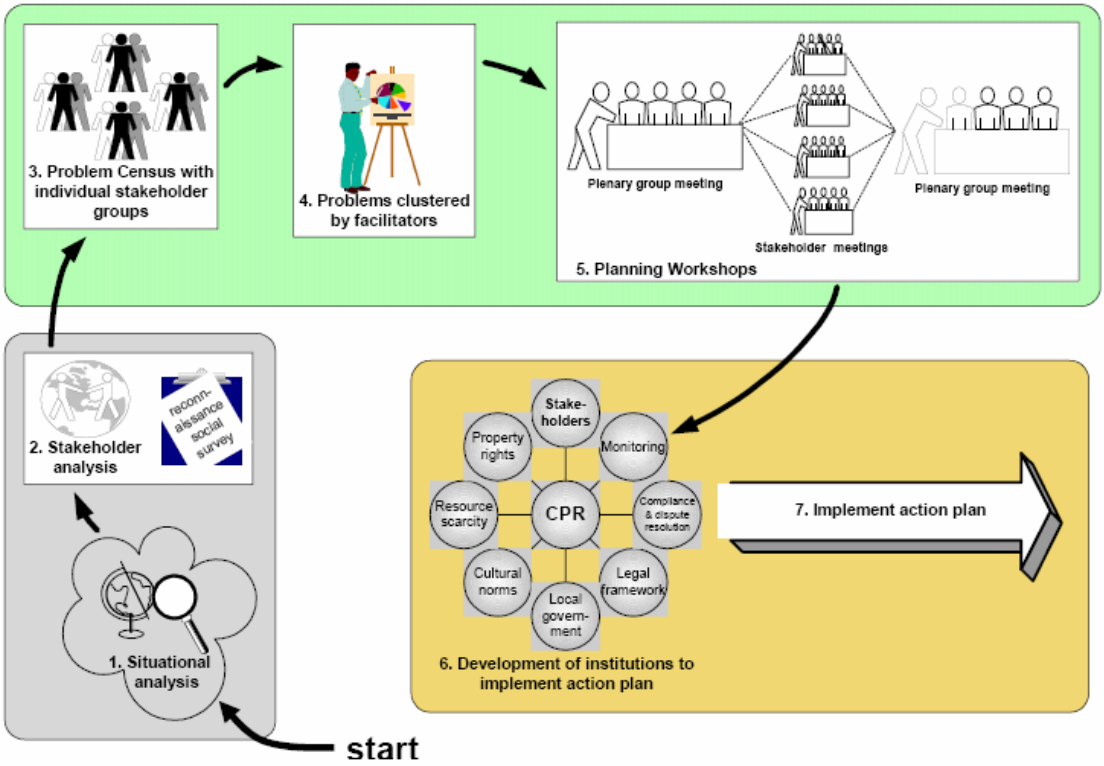
Level 2. DFID spending channels

Channels 2 and 3. There is considerable potential to apply the methodologies tested by R7562 in other country and resource contexts. The approach has already been adopted by development NGOs and the World Fish Centre (formerly ICLARM) for use in their own programmes.

Level 3. Important project features and insights

- The methodologies developed by R7562 are clearly outlined in a set of best practice guidelines 'Shaping Common Futures – Best Practice Guidelines for Consensus Management of Common Pool Resources.' (Dixon *et al.* 2001).
- This provides clear guidance on the choice and use of suitable methodologies within different natural resource and socioeconomic contexts.
- One consensus building methodology that was successfully applied by the project is the Participatory Action Planning for Development (PAPD) process illustrated in Figure 1.

Figure 1. The three phases of the Participatory Action Planning for Development



(PAPD) process with associated seven activities

PAPD is a methodology that seeks to build consensus between the different users of CPRs to improve natural resource management (NRM) to improve the livelihoods of users. The PAPD process can be represented as a three-phase process:

1. A pre-workshop 'scoping' phase
2. A participatory problem identification and investigation (workshop) phase
3. A post-workshop phase

The scoping phase - normally carried out by a development NGO with a NRM remit - consists of an informal situation analysis to gain an overview of the socioeconomic and institutional characteristics of the communities in the location, and obtain an appreciation of their systems of natural resource use. Local functionaries and key informants are consulted and their information cross-checked, and NRM systems observed first-hand.

The second phase is the PAPD workshops, entailing knowledge generation, empowerment, and the building of social capital between participants.

The third phase is the post-workshop phase of developing appropriate institutions, building community support for and implementing agreed action plans. Source: Dixon *et al.* 2001.

References

Barr, J. and Dixon, P. 2001. *Methods for consensus building for management of common property resources, Final Technical Report Volume 1 for NRSP project R7562.* UK: University of Newcastle upon Tyne.

Dixon, P., Barr, J., Lewins, R. 2001. *Shaping Common Futures – Best Practice Guidelines for Consensus Management of Common Pool Resources, Final Technical Report Volume 2 for NRSP project R7562.* UK: University of Newcastle upon Tyne.

NRSP R8223 A learning and communications programme for the PAPD method

Project summary

Project R8223 focused on scaling up the participatory method developed by R7562 so as to initiate multi-level stakeholder platforms for managing natural resources, and for capacity building in Bangladesh. The specific focus was on communicating the findings of R7562 by promoting the method within Bangladesh. The project promoted the PAPD method through producing communication materials in a variety of media, conducting workshops and site visits, and creating a PAPD resources pack and training programme.

Level 1. Millennium development goals

MDG7. This project has relevance for millennium development goal 7 because it promotes the integration of participatory methods for natural resource management into policies and programmes at the country level. Participation is integral to the principles of sustainable development.

Level 2. DFID spending channels

Channels 2, 3 and 4. This project has shown that increased awareness and promotion of project findings can lead to wider uptake of methodologies developed through NRSP projects. The PAPD methodology was also identified as applicable to a range of systems not only in the Land Water Interface, but also in forestry and livestock systems. Therefore, the research from this suite of projects has relevance for follow-up research, could potentially be transferred across regional centres, and would be of interest to international agricultural research centres as a method to be used in projects where multi-level stakeholder decision-making is needed.

Level 3. Important project features and insights

The main lessons learned from this project have been:

- The need for a committed organisation to continually promote and develop the method.
- Promotion needs to be through an organisation with a track record in the country and field of expertise, a wide network of influential contacts, and an understanding of stakeholders.
- Thorough testing of all the materials with a broad range of stakeholders is necessary alongside a thorough stakeholder analysis.
- Distribution mechanisms for the project outputs need to be considered early on.
- Scaling up is a long-term process that requires a good understanding of institutional structures, and a level of influence is needed by the promoting organisation in the institutional change process.

References

Mulhall, A. and Islam, A. 2004. *A learning and communications programme for the PAPD method, Final Technical Report for NRSP project R8223*. UK: ITAD Ltd.

NRSP PD131 The effectiveness of the PAPD method: a comparison of community organisation experience in the CBFM-2 project

Project summary

Participatory Action Plan Development (PAPD) was developed in Bangladesh through NRSP research (R7562) to build consensus among local stakeholders on their common problems and solutions for natural resource management. This study provides statistical evidence that community-based fisheries management is more effective in achieving desired outcomes when initiated with PAPD than where NGOs follow their normal approaches.

Level 1. Millennium development goals

MDG1. The review conducted by PD131 suggests that there is greater involvement of poor people in community-based organisations for resource management when the PAPD method is used. This means that the poor are able to benefit from the improvements in personal benefits created by the community-based organisation.

MDG7. The PAPD method creates awareness of the long-term environmental benefits of community-based resource management, which are also given greater importance among local stakeholders. This can only have benefits for environmental sustainability in local fisheries.

Level 2. DFID spending channels

Channels 2 and 3. The suite of projects that have focused on the PAPD method in Bangladesh represent a rich resource on which to build research and development projects in the South Asia research centre. There is also the possibility that the PAPD method could be applied in other regional centres in order to facilitate community-based resource management.

Level 3. Important project features and insights

Allowing for the type of waterbody, which is associated with issues such as leasing which increases conflict, and other relevant factors, PAPD was associated with:

- A saving of about 100 days in the process of forming community-based organisations (CBOs).
- CBOs that hold 3-4 times more awareness raising events.
- CBOs that include representatives of more stakeholder categories, yet 66% of their membership is poor (compared with 33% in non-PAPD sites).
- Participants rating significantly higher the improvements in social cohesion.
- Participants perceiving more personal benefits and expecting more long term community (environmental) benefits to which they give greater importance.
- Natural resource management actions that occur about 100 days sooner after CBO formation (and over 180 days earlier from the start of NGO support).
- An average of about three more resource management actions implemented within about two and a quarter years, and fewer plans that were not implemented.

- Many fewer rule breaking incidents and conflicts, despite a similar number of fishing rules in place in PAPD and non-PAPD sites.
- Recognition that more types of people were benefiting and higher ratings for the benefits to fishers and other stakeholders; and
- Reportedly greater improvements in local government attitudes in favour of user community management.
- Yet participants spent about 200 hours per year less on resource management.

Case studies indicated that PAPDs have given a direction for CBFM activities and helped initiate the local institutions and community organisations. Generally, the PAPD process appeared to generate plans as a focal point for action, greater unity among fishers, and support from local leaders compared with the situation with NGO support but no PAPD.

References

Sultana, P. and Abeyasekera, S. 2004. *The effectiveness of the PAPD method: a comparison of community organisation experience in the CBFM-2 project, Final Technical Report for NRSP project PD131*. Dhaka, Bangladesh.

NRSP R8103 Consensus for a holistic approach to improve rural-livelihoods in riverine-islands of Bangladesh (CHAR)

Project summary

This project tests a consensus building method (Participatory Action Plan Development, PAPD) developed in a previous project, R7562, for use in the integrated improvement of floodplain management in a new floodplain location (riverine sand islands, chars). Through sustained engagement with local authorities and poor people, the project has produced a model for PAPD in which the consensus building instrument can bring poor people into local decision-making processes over the allocation and management of the natural resources on which they depend. The project has also researched the pathways for embedding the model in the system of local governance in Bangladesh.

Level 1. Millennium Development Goals

MDG1. The findings from the project contribute in a small but significant way to eradicating poverty and hunger. Modifying and testing the PAPD method so that it is applicable to Bangladesh's seven million chronically poor charland dwellers could have significant poverty reduction implications. The research has highlighted the potential of PAPD to bring forward groups of poor people to challenge institutional injustice in the management of riverine CPRs (chars), and so contribute to poverty eradication.

Level 2. DFID spending channels

Channel 2. The project demonstrates that pathways for embedding the PAPD method in the system of local governance in Bangladesh would help to ensure the integrated improvement of floodplain management to the benefit of around seven million of Bangladesh's most poor and marginalised people. A strong case can be made for future DFID spending to be allocated to up-scaling and promoting the PAPD method across the Bangladesh charlands.

Level 3. Important project features and insights

R8103 has modified and tested, through action research, an established consensus building method (Participatory Action Plan Development - PAPD) for use in the integrated improvement of floodplain management. This has enabled marginalised groups dependent on the riverine chars to enter into a dialogue with local power elites and bring their voices into local decision making processes, ultimately helping to diversify food production and reduce poverty.

R7562 (Consensus building in CPRs) was developed and applied to specific scenarios created by large fisheries. R8103 has widened the relevance and appeal of the PAPD method to a new location, the recent accretions of land in the vast river estuaries which flow through Bangladesh – riverine sand islands or *chars*. Chars, with poor soil fertility and regular flooding, are amongst the most marginal and remote land features in Bangladesh. However, around seven million people live in these charlands, the majority chronically poor. Charland resource allocation, while

officially for distribution to the landless, at the local level is dominated by local elites. The influential classes exercise power through informal channels to capture resources, making asset accumulation by the poor almost impossible.

The project findings state that the challenges for PAPD in the charlands are threefold. The first challenge is to bring the hidden informal power holders into the local consensus building process. The second is to influence the local network of organisations that support char dwellers with short-term seasonal aid to become involved in planning activities for the medium and long term. Finally, to encourage the major bilateral donors who are supporting char interventions to use their linkages with national government to facilitate this emergence of local participation and action to provide a channel for charland development and resource allocation. R8103's action research experience demonstrates that PAPD can be scaled up in donor-supported development projects for other char communities.

References

Cope, S. 2005. *Consensus for a holistic approach to improve rural-livelihoods in riverine-islands of Bangladesh (CHAR), Final Technical Report for NRSP project R8103.* UK: ITDG Intermediate Technology Development Group.

NRSP R8195 Integrated floodplain management - institutional environments and participatory methods

Project summary

Previous research had scoped the nature of floodplain production systems (R6383), and investigated the livelihood strategies and resource use patterns in the most common floodplain production systems, in which there are small waterbodies and large areas of arable land that are seasonally inundated to create open water fisheries (R6756). R6756 demonstrated the interdependence of land and water-based production systems (both physically/ecologically and socially), and the greater dependence of poorer households on, and thus the significance of, open-water fisheries. These fisheries are commons, and are managed under a range of forms of access, from entirely open (such as flowing rivers) to exclusive and strongly policed (such as small, stocked, beels and baors). These two findings – the management of (aquatic) commons affecting the poor, and the interdependence of floodplain production systems - led to the development of a methodology for building consensus in floodplain resource management (R7562). The methodology essentially leads to the production of a consensually agreed action plan for resource management. It does not extend beyond that point to consider in detail linkage with existing institutions in the community or government domains, nor how the action plan may be enshrined into a local institution for its enactment and future management. This is the entry point for R8195.

The overarching purpose of the project was to uncover the institutional arrangements most likely to achieve pro-poor and sustainable integrated floodplain management (IFM). The longer-term purpose was to influence the overall approach to IFM-related interventions by government and NGO stakeholders by developing the level of institutional awareness (knowledge and understanding of local level features that threaten sustainability and pro-poor initiatives, for instance).

Level 1. Millennium Development Goals

MDG1 and MDG7. By identifying the institutional arrangements most likely to achieve pro-poor and sustainable IFM, and by increasing awareness and influencing the approach to IFM-related interventions by government and NGOs, this project will have made a contribution towards both MDG1 and MDG7.

Level 2. DFID spending channels

Channels 2 and 3. This project, along with the others previously summarised from this node suite, demonstrate investment by DFID in follow-up research in South Asia. Specifically, the outcomes from this project allow for further research in order to improve institutional arrangements for IFM.

Level 3. Important project features and insights

The project has been successful in identifying the more appropriate institutional arrangements for IFM and conditions that are likely to result in failure.

Recommendations from the project focus on preventing undesirable outcomes from evolving. Several approaches regarding IFM design might be applied concurrently, and these are summarised in Table 1.

Cycle Stage	Frequent problems	Potential strategies	Sources
1 Local Support	Pre-initiative indifference	Simple, public examples (sanctuaries, field demonstrations etc.)	Thompson et al; 2003 MACH; 2003 etc.
	Post-initiative decline in support	Cost-effectiveness for participants & broad beneficiary range *(see Cycle Stage 3 below).*	Muir; 2003 Lewins et al; 2004
2 Facilitation	Declining dialogue & interaction	Roles for pre-existing institutions (e.g. WMAs, LGED, local initiatives etc.) or new, consolidated RMI-LGO linkage	Sultana & Lewins; 2004 MACH CoP (ners.com.)* Aeron-Thomas; 2003
	Limited participation & RMI-linked skills	Vetting of local partners	Sultana & Lewins; 2004
		Training of local level staff (community organisation, power issues etc.)	
3 Equitable Outcomes	Resource capture by non-targets	Ensure early inclusive planning	Barr & Dixon; 2001 CPP; 1994 etc.
		Increase staff awareness of power issues ("processes", RMI building training etc.)	Sultana & Lewins; 2004 Aeron-Thomas; 2003 Lewins et al; 2004
	Negative impacts on some stakeholders	Avoiding strongly subsidised inputs for production & access rights	As above
		Low-cost, smaller actions (jalmohals < 20 ha. etc.)	Begum; 2004 Thompson *et al* 2003

Table 1. Frequent problems & potential preventative strategies.

Cycle Stage	Frequent problems	Potential strategies	Sources
3 Equitable Outcomes (contd.)	Negative impacts on some stakeholders *(contd.)*	Reduced geographic coverage (smaller participant clusters)	Aeron-Thomas; 2003
		Working with pre-existing informal institutions (LIs, *samaj, salish* etc.).	Bode; 2002, Muir; 2003 Amin & Islam (in press) Lewins et al; 2004
		A change from a sectoral to a livelihoods focus (stressing delivery & interaction across groups)	Aeron-Thomas; 2003 Muir; 2003 Barr & Dixon; 2001**
		A change from technical service provision to a rights–based approach	Bode; 2002
4 Consensus	Intervention-induced conflict	Early use of participatory planning & consensus building	Barr & Dixon; 2001 CPP: 1994
		Dispute-resolution as an integral function of project RMIs	Aeron-Thomas; 2003
		Utilisation of *salish*	Muir; 2003
		Requires pre-emptive design considerations such as those outlined above (stages 1-3)	

Table 1. (continued)

*Discussion of final stages of MACH and potential role of Upazilla Development Coordination Committee (UDCC). ** In the context of developing social capital via Participatory Action Plan Development (consensus building).

References

Lewins, R. 2004. *Integrated floodplain management – institutional environments and participatory methods, Final Technical Report for NRSP project R8195*. UK: ITAD Limited.

NRSP R8306 Better options for integrated floodplain management - uptake promotion

The project documents were not available at the time of the synthesis study. The following description is taken from the NRSP website: www.nrsp.org.uk.

Project summary

Dry season water management balancing the need for fish and crop is the key in sustainable management of floodplain resources in Bangladesh. Conflicts between the farmers and fishers (or in other words rice vs. fish) relating to use of dry season water is a common feature in most floodplain basin. The farmers, who are wealthier and influential, win the game often, while the poor and landless, who make a substantial part of their livelihood from floodplain resources, lose.

A recently completed NRSP project (R7868, 'Maximisation of joint benefits from multiple resource use in Bangladeshi floodplains') developed IFM options aimed at maximising joint benefits (rice and fish) from the floodplains. R7868 used secondary data from previous LWI research to develop a computer-based model.

The purpose of this current project is to maximise joint benefits from fish and crops through adoption of improved integrated floodplain management (IFM) strategy. This will be achieved by adaptive testing of already developed IFM options (R7868), assessing impacts, and communicating the relevant IFM messages to audiences at various hierarchies including the policy stakeholders, intermediaries and practitioners through appropriate media. The aim of the project is therefore to promote the IFM options among the wider floodplain stakeholders.

NRSP R6778 Community forestry in Nepal: Sustainability and impacts on common and private property resource management

Project summary

The project aimed to develop an improved understanding of common property issues and tenure rights. It succeeded in making a substantial contribution to the development of one approach - forest user groups using participatory planning strategies - for community forestry management.

Level 1. Millennium Development Goals

MDG1. In many instances, CPRs face increased stress resulting in declining quality and alienation of poor people from accessing these resources. Based around a focus on community forestry in Nepal, R6778 has the potential to make an important contribution towards MDG1 through its development of methodologies to enable pro-poor, participatory analysis and improvement of CPR management.

MDG7. The methodologies developed in R6778 enable the development of more environmentally sustainable CPR management, as well as relieving stresses on privately owned, farm-based systems.

Level 2. DFID spending channels

Channels 2 and 3. The contribution of R6778 in developing methodologies to aid understanding of the impact of community management of CPRs is central to the search for sustainable livelihood systems. There is therefore considerable potential to build on its findings within future research and applied development projects in a wide range of different country and resource contexts.

Level 3. Important project features and insights

- Through its review of approaches to community forestry in Nepal, R6778 developed a valuable set of tools to enable communities, researchers and policy makers to monitor, evaluate and improve approaches to community forestry.
- Importantly, these tools are highly transferable across other resource and country contexts, and can facilitate better representation of poor and marginalised groups within CPR management.
- Tangible improvements to the sustainability of forest management and benefits accrued by forest users were achieved via application of these approaches. For example, prior to the development of forest user groups through this project, forests at 75% of the study sites were deteriorating, whereas now, due to diligent protection measures and in some cases active management, all are improving to a greater or lesser extent (Yadav *et al*. 2003).
- The majority of sites were also not realising the full productive potential of their forests due to *ad hoc* management procedures, an issue directly addressed through the methodologies developed in R6778 (*ibid*).
- The project also contributed empirical research on the implications of community forestry for farming.

- Tools developed within this project consisted of two methodologies and a set of indicators:
    - A Participatory Action Research methodology to assist communities in assessing implications and outcomes of Community Forestry.
    - A Micro-Action Planning process for Forest User Groups to identify their weaknesses and take action as appropriate, drawing in outside support where necessary. This approach could equally be used to enable external evaluation.
    - Key indicators to assess the development of the Community Forestry process.
- A follow-on project, R7889, 'Dissemination of research findings regarding community forestry in Nepal', disseminated summarised project findings from R6778 in the format of a set of five booklets (ODI Rural Development Forestry Network newsletter), to over 3,000 participatory forestry professionals worldwide. These documents are available at the following links:
  http://www.odifpeg.org.uk/publications/rdfn/26/page5.html
  http://www.odifpeg.org.uk/publications/rdfn/26/page37.html
  http://www.odifpeg.org.uk/publications/rdfn/26/page51.html
  http://www.odifpeg.org.uk/publications/rdfn/26/page64.html
  http://www.odifpeg.org.uk/publications/rdfn/26/page21.html

References

Yadav, N. P., Dev, O. P., Springate-Baginski, O. and Soussan, J. 2003. Forest Management and Utilization under Community Forestry. *Forest and Livelihood* 3(1) 37-50.

NRSP R7975 Social structure, livelihoods and the management of CPRs in Nepal

Project summary

The project identifies lessons learnt on community forestry processes in the Terai of Nepal in terms of methods and approach, as well as policy and practice. This project aimed to assess and strengthen participatory approaches to managing common pool resources for sustaining the livelihoods of poor people in the Terai (plains) of Nepal. The project highlights that, while the establishment of Forest User Groups (FUGs) may have led to positive environmental changes in the forests they manage, the processes of protection (rather than sustainable utilisation) have led to the displacement of forest exploitation to areas that are not so well protected. The research also highlights that in some instances the FUG process may contribute to the marginalisation of the poor, due to their exclusion from FUG membership, restrictive access regulations implemented by FUGs, and the hidden economies of FUGs.

Level 1. Millennium Development Goals

MDG1. Forest common pool resources are traditionally important for poverty mitigation in the Terai of Nepal. However, changes in management institutions that are aimed at community participation in management may have an adverse effect on poor people. The FUG process may have contributed to the marginalisation of the poor. The project proposes an analytical framework, which may help improve the way that pro-poor institutional regimes are designed.

MDG7. Management regimes of forest common pool resources need careful planning to ensure that they are environmentally sustainable and integrate the principles of sustainable development. The project highlights that the processes of protection of forest resources, rather than sustainable utilisation, may have led to displacement of forest exploitation in the Terai of Nepal. The analytical framework proposed by the project is designed to assist in the planning for sustainable forest management.

Level 2. DFID spending channels

Channel 3. The research is relevant to designing new research in the regional centres. It is of specific relevance to South Asia, but is also applicable to the design of natural resource participatory user groups in Africa.

Level 3. Important project features and insights

While there has been a lot of research carried out on community forestry in the hills of Nepal, much less has been done on the lower elevation Terai.

- This project suggests that resource quality is important for determining the nature of forest management regimes, in that higher productivity forests are less likely to be readily handed over to community management.
- Moreover, introduction of community management does not necessarily mean equitable access to the resources by poor people. The change in management has been accompanied by a loss in access by the Tharu, the original inhabitants of the Terai, who traditionally used the forests on a seasonal basis.

- The project also uncovers the importance of factors external to the community forests, and proposes a framework for the analysis of linkages between processes external and internal to communities and outcomes.

References

Chettry, B., Francis, P., Gurung, M., Iverson, V., Kafle, G., Pain, A., & Seeley, J. 2005. A framework for the analysis of community forestry performance in the Terai. *Journal of Forest and Livelihoods* 4(2): 1-16.

Chettry, B., Francis, P., Gurung, M., Iversen, V., Kafle, G., Pain, A. & Seeley, J. 2005. Challenges to increasing the opportunities for the poor to access benefits of common pool resources – The case of community forestry in the Terai of Nepal. Pp. 267-288. In *Renewable natural resource management in mountain communities*. UK: ICIMOD/NRSP.

NRSP R6919 Evaluating the trade-offs between users of marine protected areas in the Caribbean

Project summary

This project has successfully developed an approach to trade-off analysis in order to overcome the constraints inherent in traditional cost-benefit analysis. Multi-criteria analysis was used as a framework for assessing the resource use strategies, and for quantifying the impact of coastal zone management options on the urban and rural communities in the coastal zone of Buccoo Reef Marine Park. Four development scenarios were developed, and criteria to measure their impacts were identified and modelled. Sustainable management options were identified, and these options were prioritised using participatory techniques.

Level 1. Millennium Development Goals

MDG7. Marine protected areas are critical coastal resources for the small island developing states of the Caribbean. The case study research in Buccoo Reef Marine Park demonstrates the magnitude of social, economic and ecological trade-offs inherent in future planning decisions. The application of multi-criteria analysis enabled these trade-offs to be made explicit, and by incorporating participatory techniques within the multi-criteria framework the project was able to enhance decision-making in planning and management for these resources. As such, the project has contributed to the identification and promotion of sustainable resource use strategies in the coastal zone.

Level 2. DFID spending channels

Channel 2. The project has engaged in wide consultation, and as a result there has been wide interest in the methodology. The approach may be applicable to a wide range of natural resources, including forestry, terrestrial protected areas, wetlands and even urban planning. A second project, R7408, follows on from this research to investigate the institutionalisation of the methodology.

Level 3. Important project features and insights

This research has developed trade-off analysis, a combination of stakeholder analysis, multi-criteria analysis and consensus building techniques to devise sustainable management strategies that meet short-term productive needs and conserve long-term ecosystem health. Involvement by stakeholders in developing the model and in discussing the recommendations provides an opportunity to explore and construct different development outcomes. This process of involvement makes explicit the different perceptions and values of different actors. The process creates opportunities for decision-making based on consensus rather than conflict.

The key lessons learned are:

- The approach developed by this project informs the area of integrated assessment and provides empirical application of 'bottom-up' modelling in a developing country.
- The approach effectively incorporates both quantitative and qualitative indicators within the multi-criteria framework.
- The project demonstrates that stakeholder views and values can be used in a rigorous framework, which is meaningful to development planning and natural resource management.
- Participatory approaches are consistent with more technical decision support tools; the approaches are complimentary.
- The approach is flexible, applicable to other natural resources, and amenable to adaptation.

References

Brown, K., Adger, N., Tompkins, E., Bacon, P., Shim, D. and Young, K. 1999. *Evaluating the trade-offs between users of marine protected areas in the Caribbean, Final Technical Report for NRSP R6919*. UK: Overseas Development Group, University of East Anglia.

NRSP R7408 Building consensus amongst stakeholders for management of natural resources at the Land Water Interface

Project summary

CPRs are critical to the livelihoods of poor people, and by their very nature they are subject to multiple uses by multiple stakeholders. This can lead to conflicts and difficulties in decision-making. The research in NRSP R7408 builds on the work undertaken by NRSP R6919, which evaluated trade-offs between users of marine protected areas. It examines the opportunities and constraints to institutionalising participatory approaches, in particular trade-off analysis, to natural resource management. The project built on experience of evaluating trade-offs between users of marine protected areas in the Caribbean. Project outputs have since been widely applied, for example in coastal Kenya.

Level 1. Millennium Development Goals

MDG1 and MDG7. A great many poor people rely on natural resources in the coastal zone CPR. Effective and equitable management of these resources is important for both poverty alleviation and environmental sustainability. This project has highlighted that, while there are many methods for participatory approaches to natural resource management, they are not always successfully adopted and institutionalised, limiting their impact on poverty alleviation and environmental sustainability.

Level 2. DFID spending channels

Channel 2. This project highlights the importance of follow-up research. While R6919 developed a novel and potentially beneficial tool for developing sustainable management scenarios, this project has highlighted the difficulties of implementation and institutionalisation of such tools. The two projects combined should be used to inform the transfer of trade-off analysis to other settings.

Level 3. Important project features and insights

The key findings of the project were:

- Trade-off analysis is appropriate for application to wider natural resource management issues. Current application to forest management in Canada reveals the versatility of the approach.
- Trade-off analysis does not have to be applied as an entire package, but elements within it may be appropriate for different resource management situations.
- Institutions can constrain their ability to implement participatory approaches by restricting their spaces of exchange and dependence.
- Knowledge exists within institutions to determine the opportunities and constraints to participatory resource management. This knowledge can be extracted by considering the institution at different scales.
- Preconditions for participatory resource management can be usefully evaluated at the different scales. For the resource management issues at Buccoo Reef,

these scales are: community level, institutional structure, and legal and regulatory setting.

- Individual actors can play a central role in determining spaces of exchange and dependence. Further research on human and organisational behaviour may generate greater understanding of the conditions that enable rogue individuals to exert excessive influence on an institution.

Outputs from the project include a manual for the trade-off analysis approach, a hierarchy of prerequisites for participatory natural resource management, and a framework for understanding the nature of actors and networks. The hierarchy, detailed below, does not determine whether participatory approaches will be successful, but whether they can be applied given the current institutional arrangements.

Hierarchy of institutional pre-conditions for participatory natural resource management for Trinidad and Tobago

BEHAVIOURAL NORMS
Individual esteem needs:
Need to achieve/be competent/be independent (Maslow, 1970)
Desire for reputation, respect, status, recognition, dignity
Institutional:
Ability of individuals to modify rules of management (Ostrom, 1990)
Existence of a sense of community
Desire to participate by community
Methods of communication among individuals/agencies
Responsibility of individuals/citizenship

INSTITUTIONAL ARRANGEMENTS
Societal:
Representativeness of democracy
Perceptions of role of Government
Interagency communication channels
Level of organisation of informal agents
Skill development and training of agents
Organisational:
Durability of institutional arrangements
Enforcement legislation
Political accountability (Dreze and Sen, 1989)
Property rights and boundaries of resources defined
Transparent laws and regulations
Monitoring of systems/arrangements by external monitors to remove the potential for group-think (Janis, 1972)
Conflict resolution mechanisms (Ostrom, 1990)

INSTITUTIONAL STRUCTURES

Regulatory

Enabling legislation for various forms of governance and participation

Permissive governance structure which permits and supports other forms of institutions such as collective action and participation

Physical

Resource must physically be manageable (Wade 1988)

Physical organisational capacity of agencies to legislate, and to manage and police resources

Strength of organisational culture to effect change (A. Brown, 1998)

Influence of external agents (Gezon, 1998)

Source: Tompkins et al. 2001

References

Brown, K., Adger, W. N. and Tompkins, E. 2001 *Building consensus amongst stakeholders for management of natural resources at the Land Water Interface, Final Technical Report for NRSP project R7408.* UK: School of Development Studies, University of East Anglia.

Tompkins, E. Adger, W. N. and Brown, K. 2001. *A hierarchy of institutional pre-conditions for participatory natural resource management, Annex B of Final Technical Report for NRSP project R7408.* UK: School of Development Studies, University of East Anglia.

NRSP R8317 Pro-poor policies and institutional arrangements for coastal management in the Caribbean

The project documents were not available at the time of the synthesis study. The following description is taken from the NRSP website: www.nrsp.org.uk.

Project Summary

Coastal communities and environments in the Caribbean have witnessed rapid and significant changes in recent years. Coastal ecosystems are fragile and vulnerable to both land and marine-based sources of impacts, and they support a growing number and range of social and economic activities, in various sectors. Current transformations of Caribbean economies, with the growth of industry and services, and with the decline in traditional agricultural production, place increased demands on the resources of the coast. Because of the importance and diversity of uses, there are increasingly severe conflicts among uses and users of critical coastal resources.

This project builds on four earlier DFID-funded NRSP projects: R7408 ('Building consensus amongst stakeholders for management of natural resources at the land water interface', R7559 ('Improving coastal livelihoods in the Caribbean: Institutional and technical options'), R7976 ('Institutional evaluation of Caribbean MPAs and opportunities for pro-poor management), and R8134 ('Developing guidelines for successful co-management in the Caribbean'). These projects were identified for further promotional activity as part of NRSP's Caribbean Uptake Promotion Strategy.

The purpose of this project is to develop and promote institutional arrangements and policies that are suitable to the needs and conditions of the Caribbean region. It aims to do this by developing new decision support tools that draw on the experience of the NRSP projects, by formulating a comprehensive communications strategy for the dissemination of these tools, and by testing both the tools and the communications strategy in the field.

NRSP R7856 Strengthening social capital for improving policies and decision-making in NRM

Project Summary

Recent decentralisation reforms in Uganda have shown promising improvements for participatory policy formulation and decision making at community level. However, there is still concern that decentralisation has not resulted in improvements in natural resources management (NRM), nor has it affected the capacities and decision making processes of local communities. Effective decentralisation must be based on effective local institutions (or mature social capital) for engaging small-scale farmers and rural communities directly in the articulation of their NRM policy needs and innovations.

The purpose of this project was to strengthen social capital, improve local institutions and policies, and support the integration of participatory approaches to policy decision making and formulation and implementation of byelaws and local policies for accelerating wider-scale adoption and dissemination of NRM technologies in the south-western highlands of Uganda. The project explicitly addressed four key aspects of sustainable livelihoods: social capital, human capital and local policies, institutions, and processes to improve natural capital.

Level 1. Millennium Development Goals

MDG1. It is estimated that some 5 million poor rural people in Uganda live in similar physical environments to the one investigated in this study, at high population densities, relying on rain-fed arable cultivation on steep slopes and valley-bottom wetlands. Including other similar areas in Tanzania, Ethiopia, Rwanda and Madagascar raises this estimate to some 50 million people who could potentially benefit from the mechanisms developed by this project to improve local capacity for developing, implementing and enforcing policy for improved adoption of NRM technologies.

MDG7. This project represents an opportunity for the integration of sustainable development principles into country policy and local level policy development and implementation. Strengthening the policy process at the local level also has positive implications for the sustainable use of resources through the adoption of NRM technologies.

Level 2. DFID spending channels

Channels 2 and 3. The project has highlighted mechanisms that research and development organisations can use to influence policy action and facilitate the participation of local communities in policy processes. The results of the research suggest there are significant opportunities that research and development can utilise in Uganda, but also more widely in East Africa, to influence policies and accelerate wider-scale adoption and dissemination of NRM technologies.

Level 3. Important project features and insights

Project results showed how social capital is activated in pursuit of livelihoods, and how access to social capital can assist access to other forms of capital, so influencing livelihood choices and outcomes. However, results showed that social capital mechanisms alone do not possess the resources needed to promote broad-based and sustainable natural resource management. Instead, complementarities and synergies between social capital and local policies are required.

The project suggests a five 'INs' model as effective mechanisms that research and development organisations can use to influence policy action for sustainable NRM (Figure 4 below), strengthening local institutions, providing information, linking byelaws to NRM innovations, finding and promoting incentives, and building a network of influence.

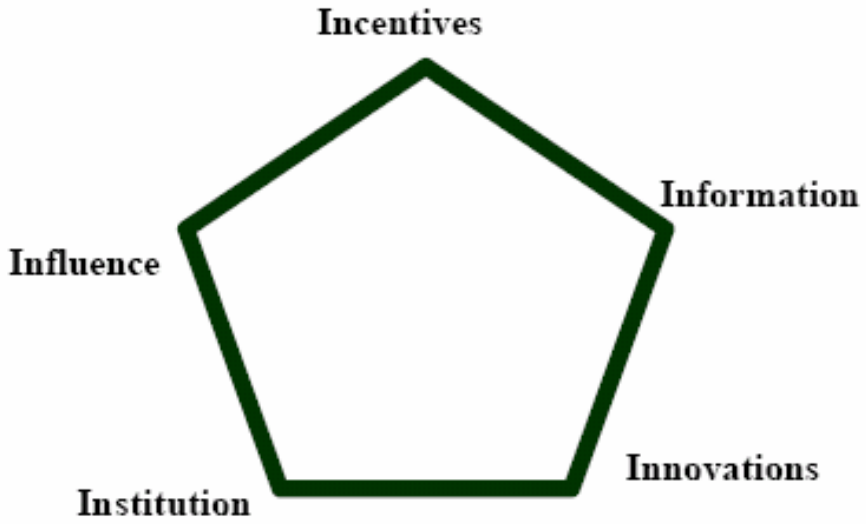


Figure 4: The Five "INs" Model for policy change in NRM

From: Sanginga et al. 2004.

Major challenges remain regarding the sustainability of local institutions for NRM policy formulation and implementation and their effectiveness in bringing about changes in NRM practice which do not disadvantage the poor. Influencing policy in NRM is a long process that needs perseverance and a sustained programme of interventions and influence by different institutions. A proactive communication strategy is required for improving uptake promotion of research products to a variety of stakeholders.

References

Sanginga, P. C., Kamugisha, R., Martin, A., Kakuru, A. and Stroud, A. 2004. Facilitating participatory processes for policy change in natural resource management: lessons from the highlands of south-western Uganda. *Uganda Journal of Agricultural Sciences* 9: 958-970.

Sanginga, P.C. 2005. *Strengthening social capital for improving policies and decision making in natural resource management, Final Technical Report for NRSP project R7856.* Uganda: International Centre for Tropical Agriculture**.**

NRSP R7857 Review of common pool resource management in Tanzania

Project summary

Common pool resources (CPRs) are particularly important in semi-arid lands due to the very large variation in resource availability over time and across areas. Traditionally, they are managed as communally owned property, but recently many such areas in Tanzania have been allocated specifically for wildlife conservation or commercial ranching. It is generally considered that CPRs are particularly important for poor people who may not have access to privately owned resources. However, communal management has also been thought to be responsible for ecological degradation, and some hold the view that CPRs might be more productively managed under private or state ownership.

The aim of the project was to contribute to the understanding of the livelihood strategies and the natural resource assets of the poor, together with the factors that shape these strategies (including social and economic change and policies, institutions and processes) through an analysis of their dependence on, and interactions with, common pool resources.

Level 1. Millennium Development Goals

MDG1. Tanzanians have a low per capita GDP of US$160, and approximately 50% of people are below the national poverty line. At the same time, semi-arid systems cover approximately 80% of the land area and are subject to a high degree of climatic fluctuation both within and between years. As a result, poor people living in these areas do not have the capital resources to avoid the risks imposed by fluctuations in production of the natural resource base. This project highlights that improving the livelihoods of poor people in semi-arid regions could be achieved through improved management of CPRs, particularly in conflict resolution and consensus building, equitable access, and support for local management initiatives at higher administrative levels.

MDG7. Most of Tanzania's natural resources are managed under communal management regimes. Promotion and support of communal management institutions to enable sustainable utilisation of these resources would contribute significantly to reversing degradation and loss of environmental resources.

Level 2. DFID spending channels

Channel 2 and 3. The project identifies key researchable constraints where research on CPR management in East Africa should focus in order to improve livelihoods. These are in decision making for land use, institutional systems for communal resource management, and institutional interactions for socially optimal outcomes. The project also identifies water as a key resource where research on institutions and governance should focus.

Level 3. Important project features and insights

The three main areas of research recommended by the project are in making decisions, institutional systems, and institutional interactions. These areas are considered important because recent changes in Tanzanian land, forest and wildlife policy have emphasised the importance of village management planning. Empowerment of villagers enables new approaches to be developed for improving livelihoods and sustainable NRM, and estimations of returns from CPRs are not straightforward as there can be indirect use values in addition to direct use values.

Field research carried out by the project has revealed that water is the key natural resource in semi-arid Tanzania, and the spatial arrangement of resources in the landscape is an important constraint to successful and sustainable management of CPRs.

Institutional analysis revealed that water was generally well managed through common property regimes. However, many institutions, especially those for forest CPRs, were unable to adequately deal with change, and rangeland CPR pose the most difficult questions for long-term institutional survival.

References

Lovett, J., Stevenson, S. and Kiwasila, H. 2002. *Review of common pool resource management in Tanzania, Final Technical Report for Project R7857.* UK and Tanzania: University of York, Norconsult TZ and Institute for Resource Assessment.

Quinn, C. H., Kiwasila, H., Hub, M. & Lovett, J. C. 2003. Local Perceptions of Risk to Livelihood in Semi-Arid Tanzania. *Journal of Environmental Management* 68(2): 111-119.

NRSP R7150 A synthesis of two case studies where wildlife, tourism and pastoralism interact in Kenya

Project summary

This project aimed to examine the impact of wildlife conservation approaches in two semi-arid locations with low tourism potential, and subsequently to inform policy and practice in this field. The research contributed to empirical evidence about wildlife conservation initiatives. It suggested that if wildlife conservation projects are to have a reasonable chance of success, they must pay careful attention to the potential for cash income generation from wildlife and tailor interventions to the needs on the ground.

Level 1. Millennium Development Goals

MDG1. At first glance the potential of community wildlife conservation schemes to contribute to poverty alleviation is quite high, but actual benefits are often not high enough to compensate for the losses experienced (crop damage, livestock losses, human losses, etc). Although tourism income for countries such as Kenya can be considerable, few of these financial benefits reach local levels. Wildlife conservation schemes also have the potential for conflict with local livelihood strategies, especially agro-pastoral and agricultural livelihoods, although they may be more compatible with pastoral livelihood strategies.

MDG7. This project has implications for the sustainable management of wildlife resources. Wildlife conservation interventions had a negative impact on food security and income through removing access to grazing, increasing exposure to damage/death from wildlife and pests, and the failure of benefit sharing mechanisms. In the two sites examined by the project, the conservation outcomes were also in doubt. At one site, although there was some evidence of an increase in certain species of wildlife, this was accompanied by decreases in others, while in the second site there was no evidence of any increase or decrease in wildlife numbers.

Level 2. DFID spending channels

Channels 1 and 2. There is potential here to contribute empirically to research examining the success or otherwise of conservation and development projects.

Level 3. Important project features and insights

This project contributes to the empirical evidence on the success or otherwise of tourist-driven wildlife conservation initiatives. The key outcomes are:

- Community wildlife conservation initiatives driven by tourism need to be in areas of high-income generation potential.
- There needs to be capacity building and accountability in local institutions, accompanied by dialogue and strong links between communities and local/national government structures.
- Without the conditions above, wildlife is likely to have a negative impact on food security and incomes.

- The project has developed the following criteria for community wildlife management that strengthens livelihoods and conserves wildlife:
    - Potential for cash income generation is high
    - Intervention is tailored to local situation
    - There are better institutional links and capacity
    - There is better local participation
    - There is inter-sectoral policy coordination

References

Lewis, V. and Coupe, S. 2000. *A synthesis of two case studies where wildlife, tourism and pastoralism interact in Kenya, Final Technical Report for NRSP Project R7150*. UK: Intermediate Technology Development Group.

NRSP R7304 Zimbabwe: Micro-catchment management and common property resources

Project summary

This project aimed to develop and promote strategies to improve the livelihoods of specific groups of the poor through improved integrated management of common pool resources in two representative micro-catchments in Zimbabwe's semi-arid communal lands. The project found that through investigating livelihood changes and integrated modelling, rainfall and macro-economic state were identified as dominating the system. Human impacts through management appeared to be secondary. The limited successes of interventions initiated by the project, in terms of marked reduction in poverty, suggest that, by themselves, single interventions are unlikely to reduce poverty substantially, and a more integrated, sustained and multi-level set of interventions and support are required.

Level 1. Millennium Development Goals

MDG1. CPRs contribute between 30-50% of income to all households in all wealth quartiles. Forest products are more important for low-income households, while grazing pastures are more important for high-income households. This project has important implications for the millennium development goal to eradicate extreme poverty and hunger. Its findings suggest that local interventions such as expanding irrigation, introducing new technology, or increasing cattle production have little impact on levels of poverty, in part because of the lack of access by the poor to assets such as remittances or crop sales (or cattle) that allow households a way out of poverty. Local institutional interventions have been found to increase cash incomes by only 8%, while expanding irrigated gardens only impacts on poverty by strengthening safety nets. Woodland CPRs have only limited potential because of overuse and low returns.

MDG7. Soil and water conservation measures in dryland production systems were found to contribute very little to increasing cash incomes. This has implications on processes for sustainable management of resources in these areas.

Overall, in order to achieve the MDGs a more integrated and multi-level set of interventions and support is advocated.

Level 2. DFID spending channels

Channel 2. Continuity of the research suggests that DFID should continue funding in this area, but the current political situation in Zimbabwe makes that highly unlikely. However, it is possible that the approaches developed by this project could be applied to semi-arid regions in the East Africa Regional Centre.

Level 3. Important project features and insights

- The key output from this project is that single local interventions in natural resource management are unlikely to reduce poverty.

- The local context has important implications:
    - Physical and social catchments are complex in terms of actors and rules in resource management, and they do not always work in accord with one another.
    - Local management has greater legitimacy for local communities, but it is marginalised by the national governance framework. However, local management does not necessarily mean better management since there can be high levels of corruption and rent seeking.
    - Huge climate fluctuations can have more important impacts on resources than human use. This variability will often override any local initiatives to improve incomes from natural resources.

- The mismatch between local and district rules for CPR management needs to be addressed, along with greater accountability and capacity building to create empowering and enabling environments for individuals and households.
- Single interventions need to be replaced by integrated, sustained and multi-level support.

References

Mandondo, A., Frost, P., Campbell, B. & Mutamba, M. 2002. *Micro-catchment management and common property resources in Zimbabwe, Final Technical Report for NRSP Project R7304*. Zimbabwe: Institute of Environmental Studies, University of Zimbabwe.

NRSP R7973 Policy implications of common property resource (CPR) knowledge in India, Zimbabwe and Tanzania

Project summary

This project aimed to understand the relative dependence of poor communities on wildlife, livestock and crops, and their interaction; to review the extent of current knowledge of CPR management in the India, Tanzania and Zimbabwe; and to identify the policy implications of this knowledge. The project developed a common analytical framework for the analysis of multiple-use CPRs in the semi-arid regions of Africa and India.

Level 1. Millennium Development Goals

MDG1. CPRs play a critical role in providing food and income generating opportunities to the poorest people in many developing country contexts. R7973 makes a contribution towards achieving the eradication of extreme poverty and hunger through its development of a framework for the analysis and understanding of the choices involved in developing policy for managing multiple-use CPRs in semi-arid regions of Africa and India. This framework provides the basis for the methodology developed in R8280, which facilitates the evidence-based resolution of CPR management policy conflicts to the benefit of the poor.

MDG7. Pro-poor CPR management requires the resource base to be maintained in the long term. By developing a framework that can underpin evidence-based CPR policy conflict resolution, R7973 therefore also makes a contribution to environmental sustainability.

Level 2. DFID spending channels

Channel 2. Follow-up to existing DFID natural resource projects.
There is considerable potential to follow-up R7973 and the corresponding methodology developed in R8280 in order to gain insights in different natural resource and country contexts.

Level 3. Important project features and insights

R7973 developed a framework for evidence-based understanding of the complex choices involved in resolving CPR policy conflict as illustrated in Figure 1. A methodology for empirically applying this framework was developed and tested in R8280.

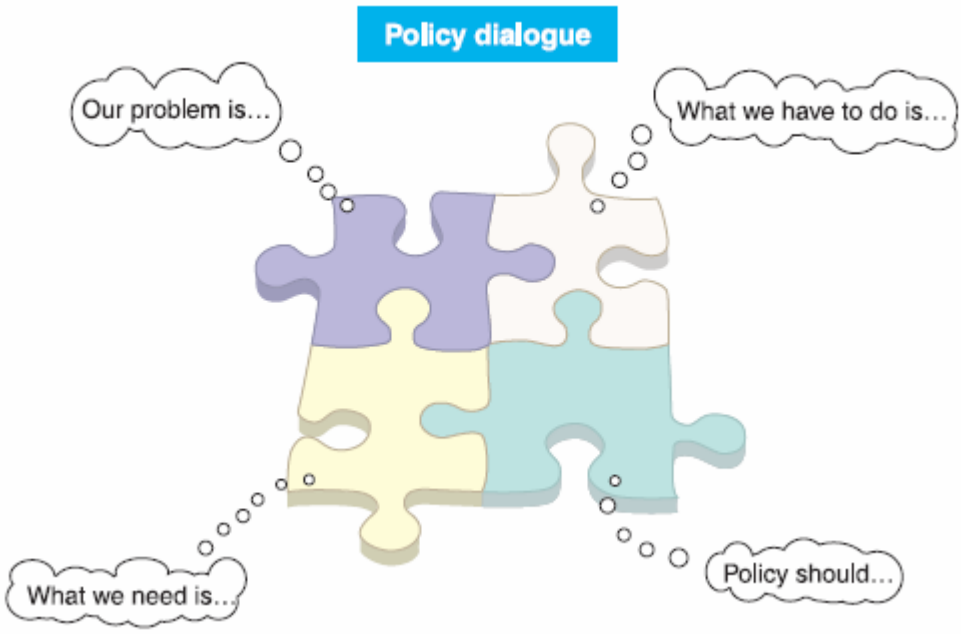


Figure 1. Cognitive conflict over common pool resources

CPR stakeholders are only able to define management problems in the context of their own subjective and dynamic knowledge, understanding, and experiences of natural resource management. Agreement on suitable solutions is limited because stakeholder perceptions of desired responses to the problem are likely to differ in line with the different underlying assumptions upon which they define the problem. Policy conflict over the management of CPRs is therefore not simply material, but also depends on the perceptions of protagonists. An understanding of these differing perceptions is fundamental to resolving CPR management conflicts. Source: Adams *et al*. (2003).

References

Adams, W. M., Brockington, D., Dyson, J. and Vira, B. 2003. Managing tragedies: understanding conflict over common pool resources. *Science* 302(5652): 1915-1916.

NRSP R8280 Incorporating stakeholder perceptions in participatory forest management in India

Project summary

The project aimed to improve policy and institutional arrangements for pro-poor participatory forest management in India through the validation and promotion of an analytical framework. The project successfully developed and tested a methodology that was able to empirically articulate the perceptions of key stakeholders, engaged with local CPR user groups, and identified the limited impact on policy dialogue as a key researchable constraint.

Level 1. Millennium Development Goals

MDG1. R8280 makes a contribution towards achieving the eradication of extreme poverty and hunger through its development of a methodology that can empirically articulate the perceptions of key CPR users, including the poorest, most marginalised and often illiterate users. By articulating both areas of conflict and consensus between different CPR users, this methodology provides the potential for evidence-based policy responses that can improve CPR management to the benefit of the poor.

MDG7. It is in the interests of all CPR user groups, particularly the poorest users, that the resource base is maintained in the long term. By developing and testing a methodology that can be used to improve CPR management, R8280 therefore also makes a contribution to environmental sustainability.

Level 2. DFID spending channels

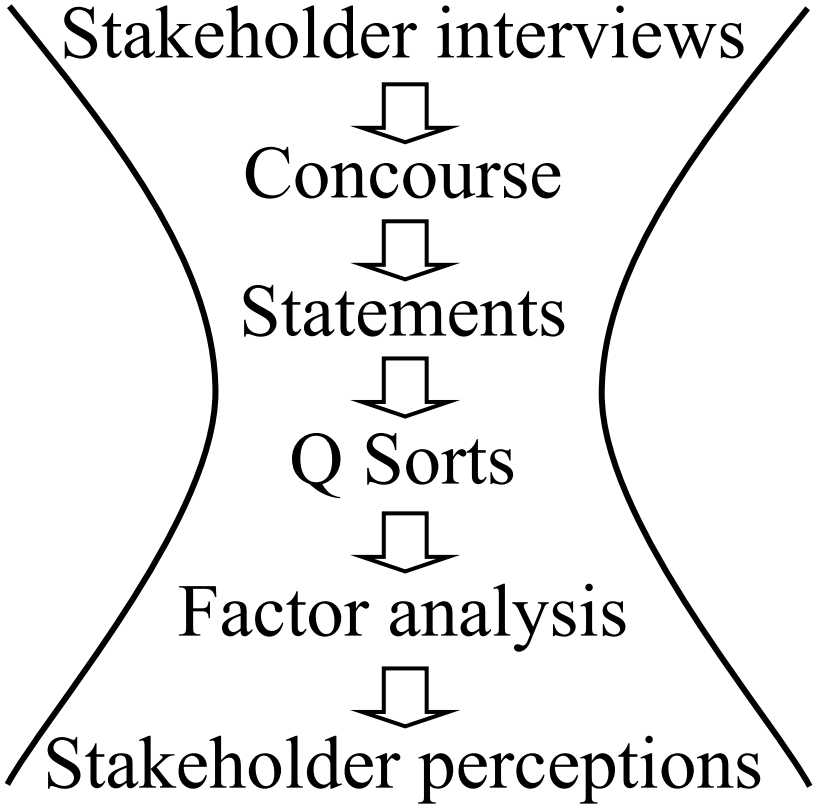
Channels 2 and 3. There is considerable potential to follow-up R8280 by applying the methodology it developed and tested within alternative natural resource and country contexts.

Level 3. Important project features and insights

R8280 provided empirical contributions in a range of areas relevant to CPR management. Four key contributions of interest to the synthesis study are:

- The successful development and testing of a methodology (see Figure 1) that was able to empirically articulate the perceptions of key CPR stakeholders in response to the analytical framework developed by R7973 (see Adams et al., 2003).
- The successful engagement with CPR user groups at the village level, including illiterate CPR users, both within the methodology and communication strategy.
- Highlighting the boundaries of the methodology's scope to capture the different perceptions of CPR users and provide the empirical evidence necessary to resolve management conflicts. The methodology cannot, in itself, resolve conflicts.
- Highlighting the limited ability of research projects to impact on policy dialogue.

Figure 1. Methodology for evidence-based analysis of stakeholder perceptions in CPR management



Drawing on the theoretical framework for analysis developed in R7973 (see Adams et al., 2003), the methodology developed and tested in R8280 is based on an innovative social science technique known as 'Q Methodology'. With its roots in psychology, this method allows for the empirical analysis of subjective stakeholder perceptions regarding CPR management. This provides the starting point for the evidence-based resolution of management conflicts. There is significant potential for applying this methodology across a range of natural resource systems and different country contexts.

Six principal steps are involved:

1. Interviews are held with a broad spectrum of stakeholders to discuss perceived issues relating to the management of the CPR in question.
2. Statements made by stakeholders in the interviews are collated to form a broad 'concourse' of statements.
3. The concourse is filtered to select a finite number of key statements from each main stakeholder group.
4. These statements are then administered on cards to a cross-section of stakeholders from each main group. Stakeholders are asked to complete a 'Q Sort' by ranking each statement card on a response scale from +2 (most agree) through 0 (neutral) to –2 (least agree). Statements can be read out to respondents or left for respondents to read and sort themselves, depending on literacy levels.
5. The 'Q Sorts' are then correlated and factor analysed to reveal significant patterns of similarity across respondents.

6. These patterns are then analysed to provide an empirically tested view of the key stakeholder perceptions that exist with regard to the management of the CPR.

References

Adams, W. M., Brockington, D., Dyson, J. and Vira, B. 2003. Managing tragedies: understanding conflict over common pool resources. *Science* 302(5652): 1915-1916.

Vira, B. 2005. *Incorporating stakeholder perceptions in participatory forest management in India, Final Technical Report for NRSP project R8280.* UK: Department of Geography, University of Cambridge.

NRSP R8116 Improving management of common pool resources in rainwater harvesting systems

Project summary

This project aimed to improve the capacity of institutions and the ability of stakeholders to plan, negotiate and implement/enforce institutional, regulatory and management systems for common pool resources in ways that protect the interests of the poor. This was achieved through analysis of the factors affecting participation, and producing and promoting planning guidelines to contribute to integrated watershed planning, which account for economic realities.

Project R8116 is linked to a number of projects that have been conducted on Rainwater Harvesting (RWH) in Tanzania, including R5170, R5752, R6758, R7888, R7949, R8088, R8115, R8381, and R8390. This summary makes reference to the series of projects on RWH in so much as they are relevant to CPRs.

Level 1: Millennium Development Goals

MDG1. Water is a critical CPR in semi-arid Tanzania. Rainfall is most often a limiting factor in agricultural production in semi-arid regions, with most national planners considering the semi-arid region as marginal for agriculture. However, the semi-arid region is the biggest producer of crops such as maize, rice and cotton, although it is also home to the majority of Tanzania's poor. The RWH programme contributes to the security and intensification of agricultural production in semi-arid regions and so helps to reduce vulnerability to erratic and variable rainfall patterns, with enormous potential for reducing poverty and hunger.

MDG7. Rainwater harvesting techniques can contribute to environmental sustainability through providing sustainable access to water – a key attribute of MDG7. However, they need to be supported by robust management regimes if they are to contribute to sustainable development – which is also an important aspect of MDG7. While semi-arid regions may be marginal for farming, they are widely used for agriculture. Development of rainwater harvesting schemes may contribute to increased production from existing farmland, reduce pressure for clearance, and reduce conflicts over water, especially between agricultural and pastoral communities in the drylands.

Level 2: DFID spending channels

Channel 2. The continuity of research on rainwater harvesting in semi-arid Tanzania means that there is considerable scope for research to investigate the long-term implications of new technology and knowledge, institutional sustainability, and equity.

Channel 3. There is potential for the transfer of best practice from Tanzania to other semi-arid countries in the DFID regional centres. This is already reflected in R8381 (Institutionalised scaling-up and uptake promotion of outputs from soil and water management research in East and Central Africa), which is attempting to identify the barriers to uptake and develop skills, capacity and training in the target countries, and

R8390 (Needs assessment and uptake promotion of RWH research in Nigeria), which is testing the transferability of RWH research through systems analysis of constraints and examining policy processes.

Level 3: Important project features and insights

- The collection of projects on RWH in semi-arid Tanzania provide an interesting story on the implications of technological developments for resource management:
    - The programme began with projects focused on evaluating different RWH techniques in terms of their positive effect on maize yields.
    - This was accompanied by the development of the PARCH-THIRST agro-hydrological model to simulate water balance and crop growth in semi-arid regions (R6758). The model was developed from extensive field experimentation to provide a practical tool that could assist in problem analysis and screening of interventions to identify the most appropriate RWH technique for a given area.
    - Subsequent projects were concerned with improving uptake and promotion of RWH technologies and improvements to the PARCH-THIRST model.
- What was initially overlooked in the pursuit of a technological solution to an environmental problem of limited water for agriculture was the potential effect that new technologies for resource use would have on local management institutions. Adoption of RWH leads to changes or a need for change in access to CPRs such as runoff, rangelands, rivers and channels. Therefore, RWH uptake promotion needs to be accompanied by changes in management institutions so that the poor are not marginalised and find their access removed or restricted.
- Project R8116 found that current institutional mechanisms limit access to CPRs, especially by poor and marginal groups. The rich were more likely to have adequate access to runoff (approx. 50%) compared to the poor (approx. 30%). Overall, the results of the study found that there was a general trend towards weaker groups obtaining few, if any, benefits from RWH.
- The achievements of R8116 of interest to the synthesis study are:
    1. Identification of institutional weaknesses:
        a. Inequality in membership of CPR management committees between different social groups.
        b. Lack of organisation or planning above the level of village, or clear links between village and higher administrative levels including national policy and strategies.
    2. The project addressed institutional weaknesses through:
        a. The formation of catchment level and village level autonomous committees with improved representation of women and the young.
        b. Improved tenure and management of CPR through simplified procedures for land leases and capacity building in land policy and laws.
        c. Guidelines for CPR management plans and capacity building in local stakeholders.
    3. The creation of a planning guide for the development of small-scale rainwater harvesting projects at the catchment level so as to improve institutional robustness. This guide is based around the following six steps: project

identification, participatory project planning, initial feasibility study, comprehensive plan, implementation, project monitoring, and evaluation.

References

Henry Mahoo 2005. *Improving Management of Common Pool Resources in Rainwater Harvesting Systems, Final Technical Report for NRSP Project R8116*. Tanzania: Soil Water Management Research Group, Sokoine University of Agriculture.

John Gowing 2000. *Development of improved rain-fed cropping systems incorporating rainwater harvesting/conservation, Final Technical Report for NRSP Project R6758*. UK: University of Newcastle upon Tyne.

NRSP R8400 Advancing the use of the products of NRSP's past and current research projects in Eastern Africa

The project documents were not available at the time of the synthesis study. The following description is taken from the NRSP website: www.nrsp.org.uk.

Project Summary

The majority of the rural population in the humid highlands of East Africa derive their livelihood from agriculture and natural resources. However, a large percentage fails to meet the basic needs (food, shelter and health). This is attributed to decreased agricultural production as a result of land degradation in the form of soil erosion, declining soil fertility and inadequate nutrient replenishment.

Yet, over several decades, extensive research on land management has been undertaken, producing a number of technology options and innovations to combat land degradation and increase food production. However, uptake of research products has been limited, especially by policy makers and development organisations, and most of these research products are left on the shelves of research organisations. The lack of a robust communication and dissemination strategy of research results is one of the key factors limiting the adoption of NRM technologies and the impacts of research efforts on the livelihoods of poor people.

The aim of this project is to develop and promote more efficient, proactive and sustainable communication strategies for the uptake promotion of research products from four NRSP supported projects in Kenya and Uganda (R7056, 'Nutrient sourcing and soil organic matter dynamics in mixed-species fallows of fast growing legume trees'; R7856, 'Strengthening social capital for improving policies and decision making in NRM'; R7517, 'Bridging research and development in soil fertility management'; and R7962, 'Linking soil fertility and improved cropping strategies to development interventions').

NRSP R7577 Environmental policies and livelihoods in the forest margins of Brazil and Ghana

Project summary

This project aimed to develop a better understanding of how policies to manage natural resources affect the livelihoods of people in the forest-savannah transition zone in Ghana and Brazil. Policies intended to conserve the environment in the forest margins are not being effectively implemented, often because issues of conservation are set aside if they conflict with economic activity, but also because policy makers (local government) lack the resources, capacity, and experience to implement policies.

Level 1. Millennium Development Goals

MDG1 and G7. The project looked at the livelihood impact of environmental policies in the Ghanaian FAI, and concluded that these policies had little livelihood impact because they were poorly implemented. By deriving lessons and guidelines for policy makers to improve the implementation of these policies, the project makes a direct contribution to both MDG1 and MDG7. However, neither the livelihoods of the forest dwellers, the environmental policies, nor the lessons for improving them are considered in the context of forest resources as CPRs. This presents an opportunity for further research.

Level 2. DFID spending channels

Channels 1 and 2. According to the research, livelihoods in the forest margins are built almost entirely on the use of local natural resources in farming, forestry, charcoal production, hunting and gathering, with little else of any consequence taking place. There is little evidence that the project looked any closer at the nature of forest resource ownership and management at the local level. Future research could assess the extent to which communal land management practices could be used to improve both environmental sustainability and livelihoods.

Level 3. Important project features and insights

- The combination of economic motivations and government policy with a narrow perspective (focusing on the short-term benefits of removing forest for the value of the timber and for the value of the cleared land, rather than the long-term environmental benefits of conserving the forests as a public good) has lead to two significant problems in Ghana and Brazil:
    - The loss of tropical forest and alienation; and
    - Marginalisation of the poor dwelling in and around the forest margins.
- The research was designed to examine the policies intended to conserve the environment in the forest margins, and to assess their impacts on the livelihoods of the poor living in such areas.
- The project concludes that these projects are not being effectively implemented, often because issues of conservation are set aside if they conflict with economic activity, but also because policy makers (local government) lack the resources, capacity, and experience to implement policies.

- Although the project mentions that the rights of indigenous forest residents have been set aside in favour of the economic interests of more powerful actors, it does not explicitly mention the CPR-related livelihood activities of these forest residents, or the livelihood and environmental benefits to be had from communal land ownership and management.
- Policies are considered in terms of environmental conservation and their positive and negative impacts on livelihoods.
- Scant consideration is given to managing forest resources as CPRs and the potential for both conservation and livelihood benefits. This is not so much a failing of the project, which set out to assess the livelihood impact of environmental policies, but an obvious knowledge gap that deserves further research.

References

Wiggins, S. 2003. *Environmental policies and livelihoods in the forest margins of Brazil and Ghana, Final Technical Report for NRSP project R7577.* UK: University of Reading.

NRSP R7957 Poverty dimensions of public governance and forest management in Ghana

Project summary

This project investigated the livelihood strategies of rural resource users in the forest-savanna transition zone in Ghana and carried out a scoping study of potential institutional strategies for environmental management under administrative decentralisation. Knowledge of the social and institutional dimensions of natural resource management in the transition zone was improved, and alternative strategies for developing and delivering appropriate participatory management approaches to benefit the poor were identified.

Level 1. Millennium Development Goals

R7957 demonstrates how research into improved management of forest resources in Ghana can contributed to both Goal 1 - eradicating poverty and hunger through improved livelihoods, and Goal 7 - ensuring environmental sustainability through effective democratic decentralisation of environmental policy.

Level 2. DFID spending channels

Channel 1 and 2. CPRs can play a role in ensuring that forest resources are used more efficiently, equitably, and sustainably, while at the same time improving the livelihoods of primary users. The project noted that issues relating to social complexity, heterogeneity of farming systems, and the intricacies of tenure rules in natural resource management in the transition zone, are still rather neglected. A significant knowledge gap to emerge from the Ghana 1 node suite of projects is the extent to which improved CPR management, focusing on these issues, can safeguard both the condition of natural resources in the transition zone and the interests of the poor and vulnerable.

Level 3. Important project features and insights

The OVI for Output 1 in the NRSP's FAI Logframe is: 'By 2002, new approaches to the management of common pool resources and forest biodiversity validated in two target areas, including Ghana FAI.' R7957 recognises that despite the presumption that land and tree tenure in Ghana are under 'community ownership', a substantial part of the natural resource base is actually owned by those in direct contact with the resource. Consequently, and despite its current vogue in development policy circles, democratic decentralisation remains largely unresponsive to primary resource users, and ownership and control of forest resources are captured by elites such as chieftaincies. Environmental policies are marked by unproven crisis narratives (the culpability of smallholder agriculture for the loss of forest cover through practices such as charcoal burning and shortening fallows), and justify elite capture of FAI natural resources. The project concludes that in order to place small farmer interests more firmly at the centre of the environmental debate, institutional arrangements are required that:

- Create strong local platforms for negotiation by the users of the key resources

- Lead to the creation of information systems the public and policy makers can use to learn about the conditions that affect the farmers' daily lives. These new information systems should:
    - Be socially and occupationally inclusive
    - Involve a consultative process with a wide range of interest groups within rural areas
    - Bind policy-makers to downward accountability

References

Amanor, K., Brown, D. and Richards, M. 2002. *Poverty Dimensions of Public Governance and Forest Management in Ghana, Final Technical Report for NRSP project R7957*. UK and Ghana: Overseas Development Institute and Institute of African Studies, University of Ghana.

NRSP R8258 Informing the policy process: Decentralisation and environmental democracy in Ghana

Project summary

This project is still ongoing and project documents are not yet available.

This project builds on a previous NRSP scoping study, R7957 ('Poverty dimensions of public governance and forest conservation'), which investigated environmental management under decentralisation in Ghana, and revealed a very low level of responsiveness to the interests of the resource users. This project aims to help create policy frameworks which are more transparent and evidence-based, and more responsive to local interests. In this way, it aims to generate new knowledge to enable poor rural people to improve their livelihoods. Expected outputs will be improved quality of information available at national, district and local levels on production systems, constraints, resource bases, different resource interest groups and options for social groups and communities within districts; networking between groups of farmers established within the region to share experiences on responses to particular problems and innovations; and articulation by rural producers of their needs and problems to unit committees and district development organisations.

Reference

NRSP website: www.nrsp.org.uk

NRSP R7867 Filling gaps in knowledge about the peri-urban interface around Hubli-Dharwad

Project summary

Natural resource-based systems need to be understood before they can be managed effectively. This is particularly so in the peri-urban interface (PUI), where change is rapid in terms of both physical development (urban expansion) and livelihoods as people seek to adapt to survive or to take advantage of new opportunities that arise. This project generated new knowledge about the livelihoods of the poor and the management of natural resources in the peri-urban interface of Hubli-Dharwad. The poor were identified and their livelihoods characterised, and the project developed an understanding about what is different about livelihoods and natural resource management in the peri-urban interface. Agriculture is still a very important activity around Hubli-Dharwad, even in built up suburbs, but there is erosion of traditional NR management systems without adequate replacement with new management regimes. This is identified as due to a lack of integration of private individuals, civil society groups, and regional authorities.

Level 1. Millennium Development Goals

MDG1. There is no evidence from this project or the NRSP PUI project portfolio to support the assertion that PU CPRs play a role in poverty alleviation and mitigation. That is not to say that they don't play a role, but rather there is no evidence.

MDG7. Erosion of traditional CPR management regimes evident in the PUI leads to the pollution and depletion of natural resources. Improved management of PU natural resources requires further research, but this does not necessarily mean these resources should continue to be managed as CPRs.

Level 2. DFID spending channels

Channel 1. Due to the lack of research on CPRs in a PU context both within RNRRS projects and within the wider literature, future spending could address the fundamental lack of knowledge and understanding of PU CPRs. Our contribution here has to be to identify the key researchable questions. These questions will necessarily be broad and open, rather than project specific. See Key Issues relating to PU CPRs summary.

Level 3. Important project features and insights

The purpose of the project was to fill gaps in knowledge about the PUI in Hubli-Dharwad, specifically assessing the livelihood characteristics of the PU poor under the influence of urbanisation. NRSP PUI projects including R7876 do not specifically address PU CPR issues as an end in themselves. Consequently, any claims made about PU CPRs will not be supported by evidence from individual projects.

- The project has pointed to several PU NRM issues which have CPR-relevant aspects, including:

    - The erosion of traditional NR management systems without being adequately replaced by new management regimes due to lack of integration of private individuals, civil society groups, and regional authorities.
    - Agriculture is still a very important activity in Hubli-Dharwad PUI, characterised by very diverse cropping systems (grain legumes, fruit trees, and vegetables).
    - Poor often unable to take advantage of the opportunities presented by proximity to the market as they rate food security as a higher priority than sales. Very little marketing achieved by the poor as they concentrate on producing low value products with no added value.
    - Irrigation using sewage polluted waste water both an opportunity (is this a PU specific CPR?) and a health risk. CPRs (channels, etc) increasingly polluted as no longer managed communally.
    - Dairying – opportunity for landless to use communal lands, but may lead to conflict with other users.
    - Wealth differences and resource limitations mean access to CPRs is not open or equal
    - Water tables falling in villages surrounding city due to over-extraction from boreholes (tragedy of the commons?). Conflict over water use between wealthy and poor.
- The project summarised the impacts of urbanisation:
    - Higher wage rates for manual labour in the city than in the rural agricultural sector.
    - Better marketing opportunities in the city compared to rural areas.
    - Access to resources not available in rural areas – solid and liquid waste.
    - Anthropogenic environmental damage attributable to the influence of the city, e.g. clay mining and brick making, leading to pollution of CPRs.

  The implications of these impacts on CPRs have not been researched.

References

Brook, R. M. 2002. *Filling gaps in knowledge about the peri-urban interface around Hubli-Dharwad*, *Final Technical Report for NRSP project R7867*. UK: School of Agricultural and Forest Sciences, University of Wales.

NRSP R7872 Renewable natural resource-use in livelihoods at the Calcutta peri-urban interface

Project summary

Aquaculture and horticulture practices exploiting wastewater resources in peri-urban Calcutta were developed and refined by farmers. Currently, the pond area managed for wastewater aquaculture extends to nearly 3,500 ha divided into several hundred fisheries. Various historical reasons and government interventions have contributed to the scale and distribution of land holdings in the area. Furthermore, landowners are commonly absentee landlords and management of the fisheries is largely undertaken by leaseholders; others are operated by fishermen's cooperatives and groups, and a small number are under government control. Recently it was estimated that ponds managed for wastewater aquaculture produce >18,000 tonnes per year of fish for sale in urban markets, many of which service poor communities.

This project aimed to generate knowledge on the role of the Land Water Interface production system in the livelihoods of poor people at the Calcutta peri-urban interface, enabling actors and stakeholders to better understand benefits derived from these activities, and facilitating institutional dialogue on developing peri-urban (PU) natural resource management strategies that benefit the poor.

Level 1. Millennium Development Goals

MDG1. As with the other NRSP projects in the peri-urban interface (PUI) project portfolio, there is no evidence to support the assertion that PU CPRs play a role in poverty alleviation and mitigation. That is not to say that they don't play a role, but rather that the role they do play is not demonstrated in this project.

Level 2. DFID spending channels

Channel 2. Due to the lack of research on CPRs in a PU context both within RNRRS projects and within the wider literature, future spending could address the fundamental lack of knowledge and understanding of PU CPRs. The project does point to some key researchable questions that need answering, including the extent to which the success of PU aquaculture and horticulture is dependent upon communally owned and managed ponds, and communally owned 'natural resource' inputs such as organic waste water.

Level 3. Important project features and insights

The project focuses on the land-water interface production system (PS) - specifically waste water re-use for small-scale fishery aquaculture and horticulture - in PU Kolkata, and the constraints placed on the PS due to the impact of urbanisation (seasonal water shortages, declining access to solid organic waste, and widespread and increasing insecurity of tenure).

- Although the project touches on some CPR-related issues (the extent to which the ponds are communally owned and managed, or the extent to which organic waste could be managed as a CPR), CPRs are not explicitly discussed.

- The project also touches upon issues central to PU CPR management, such as increasing land tenure insecurity due to the sale of agricultural land, and environmental degradation / pollution due to the impact of the city.
- Finally, the project's conclusion, that change occurring in PU Kolkata must be managed to involve collaboration from a range of stakeholders and local institutions to ensure that the PU poor have a voice, is equally applicable to PU CPRs, whether they remain as CPRs or are transformed into PPRs.

References

Bunting, S. 2002. *Renewable natural resource-use in livelihoods at the Calcutta peri-urban interface, Final Technical Report for NRSP project R7872*. UK: Institute of Aquaculture, University of Stirling.

NRSP R7877 Common pool resources (CPRs) in semi-arid India – dynamics, management and livelihood contributions

Project summary

This project was aimed at influencing decision makers by providing them with the knowledge required to understand the dependence of poor communities on common pool resources in semi-arid India, and the policy implications of this dependence in view of pressures on CPRs and constraints to their sustainable and equitable management. The underlying assumption was that policy makers lacked a thorough understanding of livelihood contributions of CPRs, which prevented them from taking pro-poor policy decisions related to CPR management. The project explicitly looked into innovative social arrangements such as those pioneered by grassroots organisations in the two focus states Andhra Pradesh and Gujarat. It synthesised the existing knowledge about the challenges of CPR management and the essential characteristics of successful management initiatives.

Level 1. Millennium Development Goals

MDG1. While CPRs can be integral to achieving the eradication of extreme poverty and hunger, policy makers often lack a thorough understanding of livelihood contributions of CPRs, which prevents them from taking pro-poor policy decisions in relation to CPR management. R7877 contributed to addressing this problem by undertaking a detailed overview of CPRs in semi-arid India, which provides a solid foundation for evidence-based pro-poor CPR policy development.

MDG7. By detailing the dynamic biophysical and socioeconomic links between land, water, and forest CPRs, R7877 demonstrates the need for policy to treat CPR management holistically in order to achieve environmentally sustainable resource use.

Level 2. DFID spending channels

Channel 2. R7877 identified several areas for future research (see Table 1).

Channel 3. There is considerable potential to build on the findings of R7877 by using the areas it highlighted as areas for future research to inform CPR-relevant policy in other regional contexts (see Table 1).

Level 3. Important project features and insights

R7974 provided a detailed overview of CPR issues in two regions of semi-arid India in terms of:

(1) Current status and dynamics in relation to biophysical aspects
(2) Current management practices and their constraints
(3) Contributions to the livelihoods of the poor
(4) Identification of demand for alternative management options, and
(5) Ways to promote the uptake of these findings among stakeholders

Some distinctive insights provided by the project include:

- Despite the decline in the state and availability of CPRs, they remain significant within the livelihood strategies of women and the marginalised poor.
- Poor people are heterogeneous and are often involved in caste-based conflicts over CPRs to the detriment of its sustainable management. It may be that 'conflict-management' as opposed to 'conflict resolution' is a more realistic response in such situations.
- Environmental benefits may be achieved through a transition from traditional to new management structures and technologies regarding water CPRs.
- Land, water, and forest CPRs are biophysically and socioeconomically linked, and require holistic management approaches.
- Local CPR management strategies require stronger institutionalisation.
- An impending crisis looms as a result of continued population increases and continual decreasing access to and extent of CPRs.

Table 1. Issues for future CPR research

CPR	Research issue
Forests	Data and knowledge about NTFP production, collection and marketing trends
	Development of suitable NTFP production and management plans and silvicultural practices
	Economic and financial aspects of JFM and CFM (including research on ways to increase returns, and on social arrangements to enable maximum sustainable yields of NTFP
	Scope for assigning usufruct rights for forests to the poor (as opposed to whole community, or outsiders)
Common pool grazing lands and other sources of fodder	Explore the potential to use CPRs for producing high-value crops (e.g. horticultural or medicinal plants) to make CPR management more attractive
	Management practices of post-harvest fields: impact of changes in cropping pattern, trend, etc.
	Sustainable grazing systems (e.g. rotational grazing, daytime penning)
	Conditions and characteristics of effective community management
Water	Analyse and learn lessons from community-based demand management (what are the institutional requirements for controlling GW extraction?)
Crosscutting issues	Costs and benefits of rehabilitating different types of CPRs, in particular costs of community and co-management of resources
	Encroachment (who encroaches under what circumstances, and how useful is the encroached land to the encroacher)

Key: NTFP = Non-Timber Forest Product; JFM = Join Forest Management; CFM = Community Forest Management; GW = Ground Water.
Source: Adolph 2001.

References

Adolph, B. 2001. *Common pool resources in semi-arid India – Dynamics, management and livelihood contributions, Final Technical Report for NRSP project R7877*. UK: Natural Resources Institute.

NRSP R7974 Human and social capital aspects of soil nutrient management, semi-arid India

Project summary

This research project aims to contribute to an understanding of the role of human and social capital in catchment management in order to provide a sound basis for the development and validation of new approaches to natural resources management that benefit the poor. Soil fertility management is a key component of people's overall management strategies for natural resources. Both landed and landless households are involved in various ways of producing, processing, and transporting soil amendments, and in managing soil fertility in-situ through crop and livestock management.

It is commonly assumed that rain-fed areas face a soil fertility crisis. While there are concerns, this project challenges the view that farmers are not managing soil fertility carefully, and that simply more chemical fertilisers will improve livelihoods for the poor. It offers alternatives based upon consultation with farmers and analysis of a wide range of case studies. It also provides detailed information on a neglected but important aspect of these farming systems – the importance and expansion of income-generating opportunities from the trade in organic fertilisers. The research findings have implications for development programmes, future research and policy.

Level 1. Millennium Development Goals

MDG1. R7974 contributes towards achieving the eradication of extreme poverty and hunger through identifying the role of CPRs in providing the landless and marginalised poor with access to emerging markets for organic fertilisers in semi-arid India as a result of government policies that have lead to increased cattle ownership amongst these groups.

MDG7. By highlighting the role of organic fertilisers in soil fertility management in semi-arid India, R7974 demonstrates some of the complex links that exist between CPRs, poverty reduction, and environmentally sustainable resource use.

Level 2. DFID spending channels

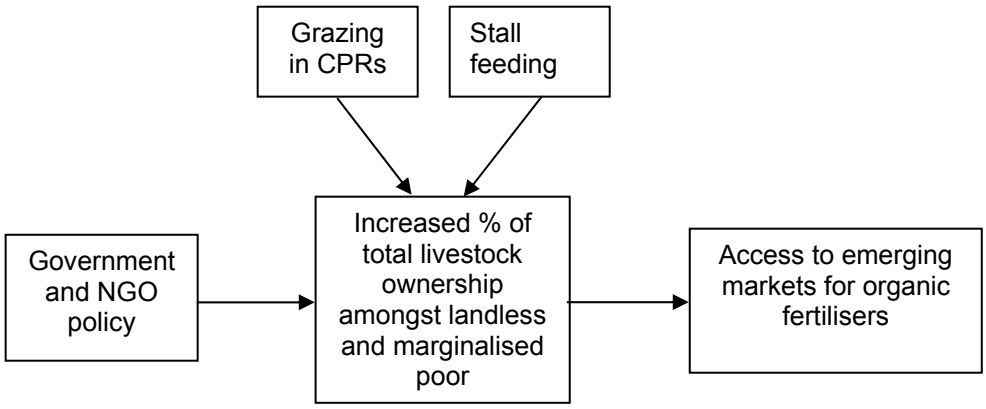
Channel 2. The institutional context that supports necessary access to CPRs to support grazing might warrant review, especially if such access requirements for grazing have only recently emerged as necessary. R7974 also identified reduced availability of grazing opportunities in CPRs due to the expansion of cultivated land leading to increased reliance on stall feeding. The long-term implications of this in terms of poor people maintaining access to new markets also warrants analysis.

Channel 3. There is considerable potential to follow up R7974 with a review of whether similar emerging market opportunities for organic fertilisers exist in different regional and country contexts.

Level 3. Important project features and insights

R7974 provided empirical evidence demonstrating the link between access to CPRs and the ability of landless and marginalised groups to capitalise on emerging market opportunities for organic fertiliser in a region of semi-arid India. This is illustrated in Figure1.

Figure 1. The role of CPRs in providing poor people with access to emerging markets



Although poor families tend to own few cattle, as a result of government and NGO schemes the proportion of livestock ownership by landless and marginalised poor families is increasing in the semi-arid area of India looked at in this study. This has provided the poor with access to emerging markets for organic fertiliser in the form of farmyard manure. CPRs traditionally provided the principal grazing opportunities for poor people's livestock. CPRs have, however, been significantly reduced by expansion of cultivated lands. This has increasingly forced poorer people to rely on stall-feeding from weeds harvested in the fields where they often work for wage labour.

References

Adolph, B. 2001. *Human and social capital aspects of soil nutrient management, semi-arid India, Final Technical Report for NRSP project R7974*. UK: Natural Resources Institute, University of Greenwich.

NRSP R8192 Enabling rural poor for better livelihoods through improved natural resource management in SAT India

Project summary

This project aims to identify and promote strategies for sustainable natural resource management (NRM) that can improve the livelihoods of landless, marginal and small-scale farmers. This will be achieved through working in a participatory mode on integrated NRM, and by ensuring better access to and control of specific natural resources by the poor.

Level 1. Millennium Development Goals

MDG1. Taken at face value the project has improved access to CPRs (both water and land) for poor people. The landless poor benefited from user cultivation rights on common land and improved access to water from village-level adoption of rain water harvesting technologies. In addition, as a new social institutional arrangement, the village advisory committees - *Salaha Samithi* (SS) - have great potential as a mechanism for the poor to negotiate greater access to CPRs.

MDG7. Other than the improved management of communal water resources through the adoption of rain water harvesting technologies, the project does not contribute any relevant new knowledge to improve environmental sustainability.

Level 2. DFID spending channels

Stream 2. The stated purpose of the project was to develop an understanding of the process issues that enable the rural poor to access natural resources for better livelihoods, of which improved access to and management of CPRs was to be a particular consideration. The new knowledge generated by the project on CPRs is minimal. However, further research should be conducted on the ability of the *Salaha Samithi* to act as mechanisms that change mindsets, allowing the poor to negotiate better access to CPRs. This, as the main finding, has generic value across semi-arid India.

Level 3. Important project features and insights

'The project did contribute to knowledge of the relative importance of CPRs to the livelihoods of the poor, but in an unexpected way. It found that relatively little CPR land remained in the project districts, much having been converted to PPR during earlier land redistribution programmes.' (R8192 FTR, Annex A, Section 2.2).

The project took existing concepts of best practice and a wide range of existing NR interventions or technologies and applied and integrated these with local adaptation to suit local conditions. Improved access to CPRs and improved CPR and PPR productivity were specifically addressed by the project. However, as the quote above demonstrates, CPRs were found to be relatively scarce and unimportant to the livelihoods of the landless, small and marginal farmers, and herders. The validity of

this claim is unclear, but a criticism of the project would be that it defines CPRs in very narrow terms, simply as communal land and water resources.

Relating to communal land as a CPR, the project succeeded in bringing a change in mindset in villagers, enabling increased access of the poor to CPRs in one village in Anantapur, and one in Mahabubnagar. Three landless households were granted user cultivation rights to two CPR lands (temple endowment land in Anantapur and the dry upper portion of a tank bed in Mahabubnagar). This was achieved through the responsible *Salaha Samithi* lobbying their official elected village-level body, the Panchayat Raj Institution (PRI). The project notes that, with only two case studies (due to the lack of suitable CPR land) being tested, this is not at the level of a promotable strategy for improved CPR management. It is an innovation, negotiated and managed by and within the community, which merits continued support and assessment.

Relating to water, the project supported the adoption of acceptable water harvesting structures as part of the community NRM development strategy. The project claims this is one way in which it has improved access and sustainable use of water as a CPR. They note that maximum benefit accrues to landowners through crop cultivation, but landless households also benefit through village groundwater recharge and surface water available to livestock and dhobis (washer women). The change in mindset also led to farmers in one Mahabubnagar village giving a portion of their unused PPR land for the construction of a check dam, and agreeing that the water should be available to all village households. Similar agreements were made for the water held in the farm ponds in all districts.

In summary, although the new knowledge generated by the project in CPR terms is small and insignificant, the value from the project is that many people have learnt much from implementing the project, particularly the staff of the participating institutions. The introduction of genuinely participatory village advisory committees (*Salaha Samithi*) has potential as mechanism for altering mindsets, negotiating access to and improving the management of CPRs.

References

Ramakrishna, Y. S. 2005. *Enabling rural poor for better livelihoods through improved natural resource management in SAT India, Final Technical Report for NRSP project R8192.* India: Central Research Institute for Dryland Agriculture.

NRSP R8100 Investigating improved policy on aquaculture service provision to poor people

Project summary

Fish culture has a long tradition in India, although the development and documentation of options suited to poor people's objectives and resources has occurred mostly over the last decade. Building on the NRSP project R6759, which tested and promoted pro-poor low-input aquaculture options and identified institutional constraints to their uptake and wider impact, this project (R8100) identified, tested and promoted improved mechanisms for pro-poor service delivery. For both projects, the target group was people of so-called scheduled castes and scheduled tribes in eastern India.

A key feature of the project's overall process was to repeatedly provide professionally facilitated 'space' throughout for farmers, fishers, service providers, policy implementers, and policy makers to express their views in a series of local and national meetings and workshops.

The main features of the project's inclusive process for transacting technical and institutional changes are broadly defined as eight steps. For each step, prerequisites are outlined (including understandings, actors, competencies and capacity building, and relationship-building), and implications summarised (covering notes, issues, and suggested actions, mechanisms and tools). A strategy for bringing through the voices of poor people in this process, referred to as *facilitated advocacy*, is developed, and the various roles that the team has taken during the course of the process are mapped. The project's process-related findings and the associated learning provide guiding principles for how pro-poor policy processes could be institutionalised.

Level 1. Millennium Development Goals

MDG1. The purpose of the project was to test and promote improved mechanisms for pro-poor service delivery in aquaculture, and as such the project has contributed to the development and promotion of efficient systems for providing rural services to poor people.

MDG7. The project was essentially a learning and opinion-collection activity to inform the development of pro-poor policy and rural services for sustainable aquaculture development. As a policy tool, this offers the potential for minimising significant negative environmental impacts, and may provide a mechanism for continued dialogue with poorer stakeholders on local environmental issues.

Level 2. DFID spending channels

Channels 2 and 3. This project has subsequently been followed by R8334, which aims to develop and promote mechanisms for the delivery of improved rural services critical to the development of rural livelihoods of poor marginalised people with complex and diverse livelihoods strategies at state and national levels in India, with priority given to three target states in eastern India. This demonstrates the scope for

follow-up research in India, which could then be expanded to the South Asia regional centre as a whole.

Level 3. Important project features and insights

The strategy developed by the project for bringing through the voices of poor people into the policy making process is outlined in Figure 1 below. The process has been termed 'facilitated advocacy', and it is a process to overcome the voicelessness that poor people usually experience over policies and management that affect their livelihoods.

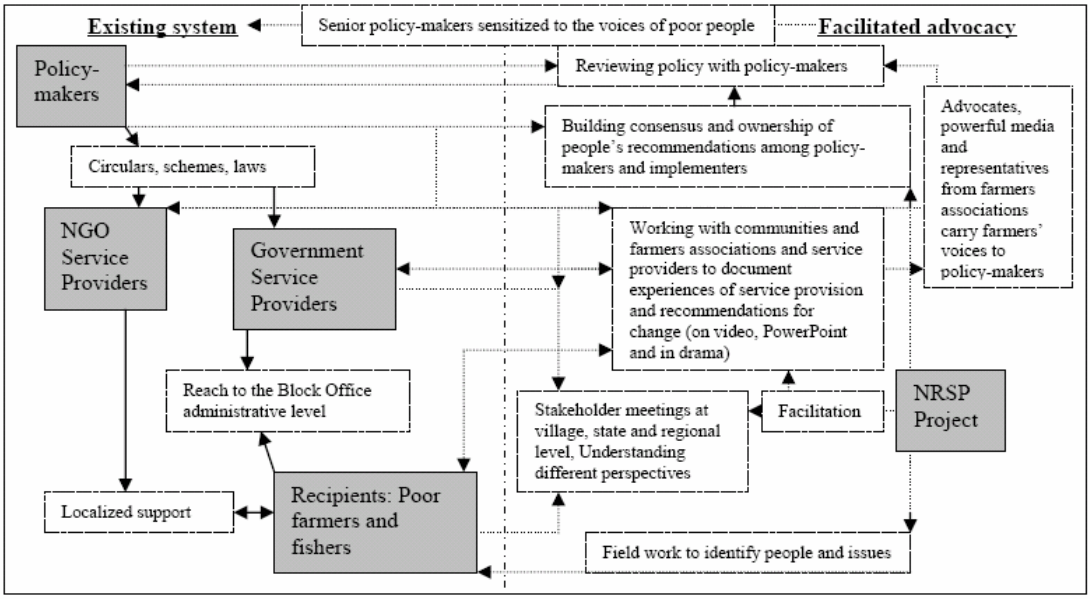


Figure 1 Bringing through the Voices of Poor People[3]

Many topics were raised about the current context of aquaculture service provision for poor people during the facilitated advocacy. Service recipients and policy implementers highlighted their limited participation in planning services and policies. They emphasised:

- Problems with processes
- Their need for knowledge and financial products
- Efforts to increase the availability of natural capital for aquaculture and awareness of government schemes and policies
- Context dependency, cashlessness and difficulties with the process of building social capital

The priorities for policy identified by farmers, fishers and policy implementers involved in the project are outlined in Table 1 below.

Table 1 Four Categories of Recommendations from R8100

Planning	1. Develop infrastructure for timely production of fingerlings at local level
	2. Leases should be given to Self-Help Groups (SHGs) for ten years
	3. Integrated aquaculture may be encouraged and loans and other facilities extended on a priority basis so that farmers may not suffer during aquaculture stress periods
	4. Site selection for pond construction should be given proper emphasis
	5. Timeliness of delivery of services, support and materials
	6. Establishment, defining and identification of model aquaculture villages for benefits to be disseminated to nearby "untouched" villages
	7. Single-point under-one-roof service provision
Support	8. Encourage formation of self-selected Aquaculture Self-Help Groups (ASHGs) based on common interests among farmers and fishers
	9. Insurance schemes for aquaculture
	10. Provide support to establish group savings and micro-credit schemes among Aquaculture Self-Help Groups (ASHGs)
Information and Training	11. Government needs to change how information is made available to farmers, since information on its schemes to support fish culture is required to be known to farmers
	12. Water quality testing equipment (should be provided)
Inputs	13. Procedure should be simplified for getting government schemes and bank loans

References

Haylor, G. and Savage, W. 2003. *Investigating improved policy on aquaculture service provision to poor people, Final Technical Report for NRSP project R8100.* India: Stream Initiative, Kasetsart University.

Haylor, G., Savage, W. and Tripathi, S. D. 2002. When policy makers begin hearing voices. *Aquaculture Asia* 7(2): 33-36.

NRSP R8334 Promoting the pro-poor policy lessons of R8100 with key policy actors in India

The project documents were not available at the time of the synthesis study. The following description is taken from the NRSP website: www.nrsp.org.uk.

Project summary

An earlier NRSP research project, R8100 ('Investigating improved pro-poor policy on aquaculture service provision') was successful in achieving several outputs. The aquaculture service needs of poor (mainly tribal) people were determined, documented, and effectively communicated to all stakeholders using a range of media. The current project, R8334, builds on the outcomes of this earlier project.

This project aims to develop and promote mechanisms for the delivery of improved rural services critical to the development of rural livelihoods of poor marginalised people with complex and diverse livelihoods strategies at state and national levels in India, with priority given to three target states in eastern India.