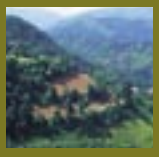
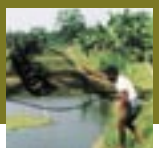





Common pool resources: management for equitable and sustainable use

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Common pool resources have a crucial role in poverty alleviation, but their use by different groups and their potential multiple uses often lead to conflict. Simple tools and techniques can be applied to promote equitable and sustainable management of these resources.

Key messages

- 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 socio-economic 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 which 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.

Summary

Common pool resources (CPRs) – natural resources such as forests, water, fish stocks and grazing land that are accessed by multiple user groups – are crucial to the livelihoods of the poor. But their potential multiple uses and different user groups can lead to conflict over their management, and the poor often lose out to more powerful groups. This Brief reports the findings of a synthesis study of projects under DFID's Renewable Natural Resources Research Strategy (RNRRS) that aimed to extract knowledge and lessons for pro-poor CPR management. Simple techniques, for example that promote consensus by increasing awareness among groups of other stakeholders' perceptions and objectives, can be applied to help manage CPRs equitably and sustainably. Social solutions are important – simple technical changes can have significant effects if the correct social solutions are in place. Analysing economic costs and benefits of CPR use, though difficult, can help guide decisions for CPR management. Equitable property rights that allow poor groups to benefit from the CPRs should be in place, and may be based on traditional management systems. International agreements that aim to protect CPRs can work to transfer technical and financial resources to help local communities manage CPRs. Local institutions need to be strengthened for effective engagement with national policy makers, and to enable pro-poor policy to be implemented.

NRSP Brief

Background

The livelihoods of many people in developing countries, especially the poorest and most marginalised groups, are inextricably linked with common pool resources. CPRs are natural resources such as forests, water, fish stocks 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.

As well as providing an essential subsistence base for the poor, CPRs can also support access to new market opportunities among these groups. Furthermore, CPRs play a fundamental role in enabling communities to cope with future stresses, such as those caused by climate change. Maintaining these livelihood contributions is dependent on the CPR being managed sustainably. Sustainable CPR management thus contributes directly to poverty reduction and environmental sustainability.

But managing CPRs is not easy. They are vulnerable to overuse; and as with many natural resources, they are subject to external pressures such as increasingly intensive farming practices or management for unsustainable short-term benefits such as timber extraction. Access to, and management of, CPRs is also often associated with conflict because of their potential multiple uses and different user groups. The poor often face substantial difficulty in gaining access to and managing CPRs, as more powerful groups tend to capture valuable natural resources.

This brief summarises a synthesis study of research on CPRs carried out under DFID's RNRRS. The purpose of the RNRRS is to generate benefits for poor people by the application of new knowledge to natural resources systems. The synthesis study extracted knowledge and lessons across RNRRS projects that may be used to inform future research and policy on CPR management for poverty reduction.

Conflict over CPR use

Conflict over CPR use usually falls into one of the following three areas:

1. Conflict between competing user groups.
2. Conflict between commercial and non-commercial resource uses.
3. Conflict between livelihood and environment priorities.

Competing user groups

CPR management is complicated by the fact that different groups of people who depend on the CPRs are often competing for the same resources. This can lead to conflict between these groups. For example, in semi-arid areas conflicts can arise between agriculturalists and pastoralists over access to land and water; and in coastal zones there can be conflict between conservation, fisheries and tourism. This is further complicated when usage patterns vary depending on the season. 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.

Commercial versus non-commercial

When resources are communally owned there is potential for conflict to arise from incentives to exploit the resource for new commercial purposes. For example, non-timber products from forests, such as fungi, fuelwood and cattle fodder, are critical to many poor people both for home consumption and sale. The harvest of these 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. 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.

Livelihood versus environment

A key potential conflict in the management of CPRs is between livelihood requirements and the environment. Environmental protection is often promoted for conservation of internationally important common heritage such as wildlife, or for the protection of natural resources such as timber or water catchments in the national interest. This can work against the needs of poor people who gain their livelihoods through access to these resources. Through appropriate planning it is possible to maintain ecosystem goods and services whilst also permitting sustainable and equitable use. However, some key considerations need to be borne in mind, as illustrated by the community wildlife conservation case study in Box 1.

Conflict due to any of these competing uses is expensive, time consuming and destabilising. The poor tend to be the losers when natural resources are contested. But conflict can be avoided and consensus created by applying simple techniques to ensure stakeholders communicate effectively, property rights are allocated equitably, costs and benefits are evaluated correctly, and local institutions are strengthened.

Box 1. Community wildlife conservation

At first glance there is good potential for community wildlife conservation schemes linked to tourism to contribute to poverty alleviation in pastoral areas of Kenya. Research demonstrated, however, that actual benefits are often not high enough to compensate for the losses experienced by local land users, such as crop damage and livestock and human losses, although they may be more compatible with pastoral lifestyles. Although tourism income for countries such as Kenya can be considerable, few of these financial benefits reach local levels.

The research identified key conditions that need to be met if community wildlife conservation and tourism initiatives are to overcome livelihood/environment conflicts. To be successful schemes need to:

- generate high cash income
- tailor the intervention to the local situation
- improve institutional links and capacity
- increase local participation and intersectoral policy coordination.

If these are not met then the wildlife conservation scheme is likely to have a negative impact on food security and incomes.

Based on NRSP project R7150

Box 2. The floodplains of Bangladesh

Floodplains in Bangladesh are highly dynamic, diverse and productive ecosystems that are the basis for the livelihoods of many Bangladeshi people, in particular the rural poor. There are about 4 million hectares of open water and 80% 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 floodplains also produce rice, vegetables and other natural products. Integrated floodplain management offers the possibility of getting the best from these multiple resources.

Inevitably there are conflicts. 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 implementation phases. The PAPD method was compared with existing non-government organisation-facilitated community development. PAPD was associated with significantly more effective formation of community-based organisations, improved attitudes and time savings. PAPD has also been adapted for use on riverine sand islands where about 7 million people live, 80% of whom earn less than one dollar per day. 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.

Based on NRSP projects R7562, PD131 and R8103

Stakeholder consensus

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. Consensus is not easy to reach because management objectives differ between users, and because stakeholder perceptions of desired responses to the problem arise from the different underlying assumptions with which they define the problem. An understanding of these differing perceptions is fundamental to resolving CPR management conflicts. There are various simple techniques that can be used to develop awareness among stakeholders of others' perceptions, and to build consensus for sustainable CPR management. For example, in the floodplains of Bangladesh, Participatory Action Plan Development was used to build consensus amongst the many and varied users of the seasonally changing fisheries resource (see Box 2).

Social and technical solutions

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 may also be needed to ensure the technical solution is implemented effectively. Conflicts and preconceptions can prevent technological innovations from being taken up, preventing the poor from benefiting from scientific advances. Techniques are available for bringing together different stakeholders in a resource, to reconcile needs and ensure poor people continue to benefit from the resource. For example, a technical model for rainwater harvesting was successfully applied in Tanzania following extensive research on the social institutions that govern access to land and water runoff (see Box 3).

Simple technical changes can have important effects if the correct social solutions are in place. For example, if managers of fish ponds in South-east Asia can be persuaded to retain self-recruiting species (SRS) such as fish, prawns, crabs and snails in the ponds and permit poor people access to the SRS,

Box 3. Rainwater harvesting in Tanzania

Water is a critical CPR in semi-arid Tanzania, which is home to the majority of Tanzania's poor. Rainfall is a limiting factor in agricultural production in most semi-arid regions, but despite this the semi-arid region of Tanzania is the country's biggest producer of crops such as maize, rice and cotton, due to efficient rainwater harvesting. Rainwater harvesting techniques that reduce conflict between agricultural and pastoral communities over access to water have been taken up by the Tanzanian Government at policy level. Adoption of rainwater harvesting leads to a need for change in access to CPRs such as runoff, rangelands, rivers and channels. The technical solutions enabling rainwater harvesting would not benefit poor people unless attention was given to these changes, to ensure that the poor do not become marginalised and find their access to these CPRs removed or restricted. 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.

Based on NRSP project R8116

Box 4. Self-recruiting species in fish ponds

Fish ponds are vital sources of protein, especially in areas of high population density such as the floodplains of south-eastern Asia. Poor people often rely on a harvest of self-recruiting species (SRS) from community water bodies and from privately owned 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 are not the species of commercial interest to the pond owners. SRS are critical for poor people, both for home consumption and sale. However, pond owners consider it good management to clean the ponds of SRS. Research showed that SRS actually 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 the poor.

Based on AFGRP project R7917

then both the owners of the ponds and poor people benefit (see Box 4).

Costs and benefits

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 incentives for those using the CPR. Techniques have been developed for local level economic analysis using participatory methods to help guide decisions on community forestry management alternatives. A trade-off analysis technique has also been applied in Caribbean coastal CPRs (Box 5).

The right property rights

Natural resources can be rapidly depleted – the classic 'tragedy of the commons' – if appropriate property rights are not in place. Most communities have traditional management systems which avoid over-exploitation of key CPRs, minimise conflict, and which allow the resources to be exploited equitably so that poor people can gain access (see Box 6).

Box 5. Trade-off analysis in the Caribbean

Natural resources are often managed by 'top-down' approaches with many stakeholders excluded from participating in decisions affecting the resource. This can result in some stakeholders disproportionably bearing the costs of management, for example they can be prevented from continuing traditional use of the resources. A technique of trade-off analysis was applied to assist in local level decision making for integrating conservation and development of Caribbean coastal CPRs. All relevant stakeholders were involved in negotiations to assess and develop appropriate management strategies through creation of criteria and scenarios which were then used in multi-criteria analysis. The trade-offs between different strategies were ranked or quantified to help achieve consensus. This method enables complex information on social, environmental and economic effects to be included in weighing up the costs and benefits of different development scenarios. The research revealed considerable consensus for long-term management priorities with high importance placed on the role ecosystem health plays in maintaining livelihoods and long-term economic prosperity.

Based on project NRSP Project R7408

Box 6. Traditional management of fisheries

On the Ghanaian coast local disputes are managed under traditional Chieftain institutions; and on Melanesian islands the customary marine tenure system controls access to fishing areas. However, in Ghana pressure on the fisheries has increased because under State Law the waters are open to outsiders; and in Melanesia customary tenure is not necessarily aligned with fisheries stocks. The solution is to combine the flexibility and responsiveness of traditional management with the authority of State Law through co-management arrangements.

Based on FMSP projects R6436 (Melanesia) and R7334 (Ghana)

Technical innovation may not help poor people if equitable property rights are not in place. Fish ponds, for example, can provide much needed protein for the poor, contributing to both health and income. In one example in eastern India, seasonal fish ponds used by self-help groups of poor people could only be leased for one year, limiting the incentive to invest in pond management. When the gap between poor people and policy makers was bridged, to bring the voices of the poor into a structured debate, the result was a government policy change extending the leases for self-help groups to ten years.

Global–local transfer of benefits

Within the last few decades a series of international conventions have been agreed which aim to protect our common heritage of biodiversity and atmosphere. These conventions put in place mechanisms by which financial and technical resources can be transferred from the global community to the local communities responsible for day-to-day management of a CPR. For example, under the Kyoto Protocol, implementation of the Clean Development Mechanism means that local communities can benefit from management of CPRs for carbon sequestration (see Box 7).

Strengthening local institutions

While changes in policy on CPRs can be effected at an international or national level, it is local institutions that need to be strengthened to enable pro-poor policy to be implemented. Local level processes such as developing, implementing and enforcing by-laws need to be carried out with participation of the communities affected, otherwise they risk being unsustainable and inappropriate. A project working with farmers in the highlands of southwestern Uganda, for example, conducted research on ensuring that local level policies worked for farmers (see Box 8).

Box 7. Markets for carbon

Research looked at how 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 would remain intact. 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 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 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–local benefit transfer if appropriate mechanisms are in place.

Based on FRP projects R6320 and R7374

Box 8. Soil conservation in Uganda

Farmers on 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 because of lack of collective action. Social capital was built by using participatory approaches to enable farmers to develop, implement and enforce local policy and by-laws so that they were effective. Community concerns were translated into effective natural resource management through the five 'INs' approach: strengthening local INstitutions; providing INformation; linking by-laws to natural resource management INnovations; finding and promoting INcentives; and building a network of INfluence. In this way technical innovations were implemented successfully and national policies made to work for small-scale resource-poor farmers.

Based on NRSP project R7856

About this brief

NRSP Briefs present research carried out at the culmination of the programme to synthesise results across projects. They derive lessons and key messages that could benefit future research and policy on a range of topics that added to or crosscut the NRSP and RNRRS research agenda.

This Brief is based on **NRSP Project R8501 Synthesis of new knowledge generated by RNRRS research on common pool resources**. Details of this project and its publications, and those of other NRSP projects, can be found in the project database at the NRSP website: www.nrsp.org.uk

Details of projects from the other RNRRS programmes can be found at:

AFGRP – Aquaculture and Fish Genetics Research Programme
www.dfid.stir.ac.uk/afgrp

FMSP – Fisheries Management Science Programme
www.fmsp.org.uk

FRP – Forestry Research Programme
www.frp.uk.com

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Other NRSP Briefs

The peri-urban interface: intervening to improve livelihoods
Linking research, policy and livelihoods: challenges and contradictions
Climate change: enhancing adaptive capacity

Communication in research uptake promotion *(forthcoming)*
Gender sensitive research in natural resources management *(forthcoming)*

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The **Natural Resources Systems Programme (NRSP)** is one of ten programmes comprising the Renewable Natural Resources Research Strategy (RNRRS) of the UK Department for International Development (DFID). The RNRRS started in 1995 and ends in 2006. NRSP's purpose is the delivery of new knowledge that can enable poor people who are largely dependent on the natural resource base to improve their livelihoods. To achieve this NRSP undertakes research on the integrated management of natural resources. This research encompasses the social, economic, institutional and biophysical factors that influence people's ability to both use and maintain the productive potential of the natural resource base over a relatively long timeframe. The intended outcome of the research is that natural resource related strategies for improving people's livelihoods, that are of proven relevance to poor people, will be delivered in forms that could be taken up by the poor themselves and/or by development practitioners operating at a range of levels, from grassroots to senior policy level.

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