

Developing incentive-based mechanisms for watershed protection services and improved livelihoods

Implementation phase of the India country study under the international project:
“Developing markets for watershed protection services and improved livelihoods”

Workplan for the period October 2004 to June 2006

Winrock International India

1 Summary

This workplan describes the India country component of an international project, “Developing markets for watershed protection services and improved livelihoods”, which is coordinated by the International Institute for Environment and Development (IIED) with support from the UK’s Department for International Development (DFID). The international project is a learning initiative that engages across-country and across-region policy learning in the Caribbean, India, Indonesia, South Africa, Bolivia and China, with the purpose of increasing understanding of the potential role of market mechanisms in promoting the provision of watershed services for improving livelihoods in developing countries. This approach is designed to complement regulatory and participatory approaches, in cases where these have not achieved adequate provision of watershed services, and in such a way, that livelihoods are improved. The international project will be completed in September 2006¹.

The India country study is one of four major ‘action-learning’ studies, the others being in the Caribbean, Indonesia and South Africa. The action-learning studies build on diagnostic studies carried out during an inception phase, which identified the potential use of, and current interest in, market-based approaches to enhanced watershed protection services and improved livelihoods. The India diagnostic study² carried out by Winrock International India (WII) demonstrated that whilst there is a range of ‘market-like’ arrangements in India, there are few examples of market-based mechanisms – though one well-known example is that of Sukhomajri. The study showed that markets for environmental services can promote equity and improved livelihoods by complementing existing regulatory and participatory approaches at the micro level. Further, the study reported considerable potential at the macro level for making more effective, regulation induced payments in the hydro-sector as well as securing urban drinking water supply. Overall there was general validation of the need for such an approach from stakeholders at different levels.

This workplan covers a 21-month period during which Winrock International India will carry out the implementation phase of the India country study. The purpose of the India action learning study is to assess the relevance and potential of market-based mechanisms to enhance watershed protection services and improve livelihoods, and to facilitate the design and use of such mechanisms when appropriate. Note that in the case of the India study we use the term ‘incentive-based mechanisms’ as it better encompasses the range of mechanisms including market like arrangements embedded in collective action situations. Also, ‘market-based’ can be negatively construed as promoting privatisation of water, an unpopular idea in India. The study has a large component of field-based facilitation and supporting studies, at two micro-level field sites in a mountainous region of Himachal Pradesh, and at one macro-level site in Madhya Pradesh. This field-level work will be done in collaboration with local partners who have worked in the field areas for some time, and who have indicated that this initiative will directly and positively impact on their own work. In addition the study will include a number of strategic studies, which will draw on learning from across India. State and national level learning groups will strengthen links to policy processes and ensure that the action learning activities remain relevant to current key issues. As this approach is flexible and adaptive, particular project activities may change in response to emerging needs and issues. Finally, a communications and information component will ensure that findings from fieldwork, strategic studies and consultations are disseminated through a variety of media. IIED will facilitate links to cross-country learning and international

¹ For further information on the international project please contact Dr Ivan Bond at IIED: ivan.bond@iied.org or see the project website: www.iied.org/forestry/research/projects/water.html.

² “Developing markets for watershed protection services and improved livelihoods in India”. Sandeep Sengupta, Kinsuk Mitra, Sushil Saigal, Radhika Gupta, Sunandan Tiwari and Neeraj Peters. Winrock International India, New Delhi. June 2003

exchange of ideas and findings through the information and communications component of the international project.

It is anticipated that by the end of the India action learning study, in June 2006, the conditions under which market-based approaches to watershed protection services are appropriate will have been identified, and the arrangements for market-based transactions will have been facilitated at three sites. The timeframe of the project does not allow for long-term benefits and sustainability of such initiatives to be conclusively demonstrated, but efforts will be made to establish the preconditions for long-term benefits to both watershed services and upland livelihoods. Monitoring systems will be put in place so that continued assessment of impacts can take place.

2 Background

With a population of over one billion, India is the world's second most populous country after China. About 72% of the population lives in rural areas. India also has a large tribal population, which stood at 68 million in 1991 and is perhaps close to 80 million at present. Poverty is one of the biggest challenges facing the country. Although the percentage of population living below the poverty line has declined sharply in the past 30 years – it was 55% in 1973-74, 36% in 1993-94 and 26% in 1999-2000 – the absolute number of the poor people has not come down significantly due to countervailing growth in the population. It is estimated that around 260 million people still live in abject poverty. Many poor people reside in forested watersheds and other upland areas.

Degradation of land and other natural resources is another major challenge facing India. More than half of India's area, an estimated 175 million hectares (53.24%) is subjected to different types of land degradation. While 23% of the country's geographical area is classified as forest land, only about half of it carries dense forests. Many critical watersheds are also becoming degraded with the consequent loss of watershed services.

Box 1: What are watershed protection services?

Watershed protection services are environmental services provided by a watershed or catchment area that produce benefits downstream, usually in the form of water quality or water quantity. These may include regulation of water flow (increased dry season flows, reduced flooding), reduced siltation, improved water quality, and so on. These services are directly influenced by upstream land use and practices– so it follows that changes in upstream land use and practices have a direct impact on watershed services. Care must be taken in making correlations between types of upstream land use and downstream impacts.³

Like many other countries, the traditional approaches in India for maintaining watershed and other environmental services have been regulation and public expenditure. Most forests and other wild lands have been nationalised by the government and large-scale watershed protection works are carried out by the state agencies. A number of laws have been enacted to protect these services, the main ones being the Indian Forest Act, 1927, Forest Conservation Act, 1980 and the Environment Protection Act, 1986.

However, the traditional regulation and public expenditure approaches have not been very successful in curbing degradation. In recent years, the government has introduced a number of reforms that have created favourable conditions for the trying out new and complementary approaches such as incentive- or market-based mechanisms.

Box 2: What are incentive-based mechanisms?⁴

³ Linkages between land use and watershed services are complex. Some recent studies have challenged commonly held perceptions about links between trees/forests and water flows. For results of some such studies, see <http://www.cluwrr.ncl.ac.uk/>

⁴ These are discussed in more detail in Landell-Mills, N. and I Porras, 2002, *Silver bullet or fools' gold? A global review of markets for environmental services and their impact on the poor*. London, IIED.

Put simply, market-based mechanisms involve a willing buyer and willing seller of a commodity. In this case the commodity is the watershed service (e.g. reduced sedimentation or water purification). As it is difficult to directly ascertain the watershed service, usually, the transaction revolves around a proxy indicator. Market payments may be in cash or in-kind. Examples of transaction mechanisms include watershed protection contracts, watershed leases, water use rights, stream flow reduction licences, and water quality credits.

In the international project these are referred to as market-based mechanisms; however in the context of the India country study we will refer to them as incentive-based mechanisms. This is primarily because 'market-based' may be negatively misconstrued as wholesale privatisation.

India initiated a major economic reforms programme in 1991 aimed at de-regulation of the economy to induce accelerated investment, growth, employment, and hence reduction in poverty. Many sectors including hydropower, water and electricity utilities have been opened up for the participation of the private sector and the government is not averse to trying market-based solutions to tackle various problems including those related to environment and poverty.

Realising the critical link between environmental degradation and poverty, the government has also launched a number of programmes that aim to address both these problems through active involvement of local communities in the management of natural resources. The major programmes include Joint Forest Management, Watershed Development and Participatory Irrigation Management.

3 Goal, purpose and outputs

The *goal* of this project is to maintain and enhance the flow of services provided by watersheds to upstream and downstream communities and users, with particular emphasis on the poor and vulnerable.

Its *purpose* is to assess the relevance and potential of incentive-based mechanisms to enhance watershed protection services and improve livelihoods, and to facilitate the design and use of such mechanisms when appropriate.

Outputs

- Incentive-based mechanisms facilitated at three sites (two smaller sites in the mountains and one larger site in the plains).
- Assessment of the impacts of incentive-based mechanisms on watershed services as well as livelihoods, particularly of the poor.
- Strategic studies to enhance the understanding of the efficacy of the current regulatory framework in maintaining watershed protection services and conditions under which incentive-based mechanisms may emerge spontaneously.
- Creation of a national level learning group and two state level working groups (Himachal Pradesh and Madhya Pradesh) to start a policy dialogue on incentive-based mechanisms.
- Documentation of the project's learning in the form of a report and its dissemination.

4 Rationale for the project

Neither regulatory nor participatory approaches seem to be effective in curbing degradation of watersheds and consequent loss of watershed services. There is poor enforcement of regulation and participatory approaches seem to work only when direct benefits from the resource accrue to the community members. Thus, critical watersheds are becoming degraded. The problem is likely to become acute as the country's population (both human and livestock) increases and a rapidly growing economy puts greater demands on the natural resources.

Many upstream communities, who are stewards of watersheds, are poor and have neither the resources nor the incentive to maintain or enhance watershed services that are used by downstream users. Quite often they are dependent on the same resource for their livelihood e.g. livestock grazing. On the other hand, people in downstream areas who benefit from these services may contribute nothing towards better management of upstream areas. Thus, there is a need to explore alternative approaches through which receivers of the

service can compensate the suppliers for changes in land use and management practices upstream to secure watershed protection services. Incentive-based approaches offer a solution that can be tried in conjunction with the other existing approaches.

5 Scoping exercise

Following the initial diagnostic study, a scoping exercise was undertaken to understand current approaches, policies and programmes for protection of watershed services and to assess the potential for carrying out further work on incentive-based mechanisms for promoting watershed protection in India.

Two states were chosen to carry out the assessment in two different contexts. Himachal Pradesh (HP) was chosen to represent the Himalayan context while Madhya Pradesh (MP) was chosen to represent the plains context. Both states have watersheds of major rivers. The other reasons for selecting these states included ongoing programmes with a focus on watershed protection (Changar and Kandi projects in HP and Rajiv Gandhi Watershed Mission in MP), large-scale decentralisation efforts, progressive policies related to people's participation in management of state forests and acute dependence of upstream communities on natural resources for their livelihood. Several hydropower projects are also under construction or in operation in both states. HP has the ongoing Forest Sector Reforms Project with support from DFID India, under which a fresh look is being taken at the issues confronting the entire forest sector of the state. MP has a number of initiatives on the issue of poverty eradication, many of which are supported by DFID India.

The assessment of the potential of incentive-based approaches for watershed protection was carried out at three different levels – micro (intra-village), meso (inter-village) and macro (hydropower projects, municipal water supply, etc.).

The scoping exercise indicated that there is certainly potential for developing incentive-based mechanisms for maintaining and enhancing watershed protection services. It also showed that markets for environmental services are not necessarily anti-poor, but in some cases can even promote equity and improve livelihoods by complementing existing regulatory and participatory approaches. There was a general validation of the need for such an approach from stakeholders at different levels.

6 Policy scenario

The present policy scenario at the national as well as state levels (in HP and MP) is conducive for the facilitation of pilot testing incentive-based approaches for watershed protection that would complement the existing regulatory and participatory approaches.

At the national level, there is strong emphasis on watershed management as well as poverty reduction, which is reflected in the large-scale watershed programmes funded by the Ministries of Rural Development, Agriculture, and Environment and Forests. These programmes are designed to address the problems of watershed degradation and poverty simultaneously, by investing significant resources in rural areas and creating jobs for the poor. The large-scale ongoing programmes in HP and MP have already been mentioned in the previous section.

There is a recognition that natural resources cannot be managed through regulation alone, which is reflected in the National Forest Policy of 1988 as well as Joint Forest Management Programmes in both HP and MP. The draft National Environment Policy (2004) highlights the importance of watershed protection services and mentions it explicitly. The National Water Policy 2002 also mentions the need to protect watersheds. Both MP and HP have prepared draft state water policies.

The draft HP water policy foresees increasing water scarcity. It emphasizes needs of the weaker sections of society and suggests consumers should pay the operational and maintenance costs for provision of water services. HP imposes an Environmental Value Tax on all agencies that divert forestland, to correct the distortion that was present in the current system of valuing forests⁵. The draft environment policy in HP

⁵ The environmental value tax itself underestimates the economic value of forestlands by focusing on the value of annual benefit flows, rather than the net present value of the cumulative flows.

recommends developing appropriate mechanisms to provide incentives to local communities to participate in forest protection and afforestation. The state has also imposed a logging ban and enunciated an ecotourism policy.

The MP government too has taken some key policy initiatives. The Lake Conservation Authority (LCA), created recently, after the completion of the “Lakes Bhopal Conservation & Management Project, aims to continue activities started during the project and to initiate holistic conservation and management of other lakes in the state. The MP draft water policy emphasizes cost recovery from water users, and institutional mechanisms that promote coordination between state departments. The MP government has attempted reforms such as enhanced cost recovery in the water sector by means of annual 5% increases in irrigation water tariffs and increased private sector participation in water sector operations.

The existing legal framework in the form of Forest Conservation Act, 1980 and Environment Protection Act, 1986 has provisions for compulsory payments for watershed protection by hydropower companies and others. However the efficacy of these payments is in question and only a small proportion are actually used for conservation and livelihood oriented activities.

7 Site selection: the first phase of implementation

An intensive site selection process was carried out between March and September 2004. This included development of criteria for selection, interaction with a range of people to identify potential sites, visits to field sites, assessment of potential sites against the criteria, and final site selection. As part of the process, two state level meetings and one national level meeting was organised in which project’s framework was discussed with a range of stakeholders.

7.1 Site selection methodology

Based on preliminary work during the diagnostic phase in 2003, sites had been conceptualised in spatial terms as intra-village (micro), inter-village (meso) and larger scale (macro) sites. In the site selection phase, micro and meso were merged resulting in two categories of sites: micro (intra- and inter-village) and macro or larger scale sites.

Subsequently a list of criteria was developed to assess sites. The criteria were refined during a workshop in Himachal Pradesh and discussed during the Madhya Pradesh state level meeting. Finally a list of 16 criteria was finalised to guide the selection process. The criteria were put into two categories: essential and desirable (see Box 3 below).

Box 3: Criteria for site selection

Essential

- 1) A watershed service related to land use (especially forests) is clearly discernable (water quantity, quality, wetland conservation, stream flow regulation, prevention of floods, soil erosion etc)
- 2) Clearly identified watershed service suppliers (preferably an upland community/village) and receivers are present
- 3) Receivers (downstream) are facing (or are likely to face) major problems due to poor quality of service (water quality, quantity, soil erosion etc), which have a strong economic impact on the receivers
- 4) The solution to the problem should lie in the upstream area. That is, the management activities of the suppliers directly affect the quality of watershed service of receivers
- 5) Suppliers and receivers are located in reasonably close proximity (so that they can engage in transactions)
- 6) There should be willingness and enthusiasm among both upstream and downstream communities to participate in a transaction related to a watershed service along with favourable political climate
- 7) There should be a willingness to pay (manifest or latent) by the watershed service receiver (downstream) to improve the service
- 8) There should be no conflicts between the upstream and downstream stakeholders which could affect the process

Desirable

- 9) Improving management of the watershed results in a “win-win” situation for suppliers and receivers
- 10) There is a possibility of cooperation with Line Departments and other key organizations in the area
- 11) Watershed service can be ‘bundled’ with other services
- 12) Presence of a facilitative organisation
- 13) Suppliers and receivers are organised. This would include the organisation of people in the upstream and downstream areas through village level institutions
- 14) Transactions are already taking place between suppliers and receivers (preferably related to a watershed service but other transactions are also fine – transactions could be in cash or kind)
- 15) Presence of traditional social linkages and mechanisms for maintaining watershed related services
- 16) Existence of base-line hydrological data

Discussions were held with key stakeholders in each state to locate potential sites. These included serving and retired government officials from a range of departments, staff from NGOs, industry, academic institutions, independent researchers and some activists. Suggestions during the workshops helped broaden the list of sites suggested for review.

Based on this exercise, 22 potential sites were identified. These criteria were used to review these sites. Finally three sites were selected in the two states, two in the Changar region of Kangra district of Himachal Pradesh, and one in the Bhoj wetlands near Bhopal in Madhya Pradesh.

7.2 Himachal Pradesh site selection

Seven micro inter-village sites and three macro sites were identified for assessment in Himachal Pradesh. The bulk of the micro sites were generated in a stakeholder workshop held in May 2004 at Palampur in Kangra district. The sites were assessed against the criteria listed in Box 3. A summary is provided in the site-criteria matrix for HP (appendix 1). Based on the assessment, the Changar region of Kangra district was selected, with two micro sites: the Bhodi-Suan catchment and the Kuhan catchment. These sites are described in more detail in section 9.1. The key watershed services under consideration are maintenance and increase in streamflow at Bhodi-Suan and control of siltation in the Kuhan catchment.

7.3 Madhya Pradesh site selection

In Madhya Pradesh twelve sites were identified for assessment. The site selection matrix is given in appendix 2. After reviewing each site against the criteria, one site – the Bhoj wetlands, Bhopal - was finally selected. This site is described in more detail in section 9.2. The key watershed service under consideration at this site is that of water quality.

8 Project methodology

The implementation phase of this project has been developed around the concept of “action learning”. Action learning is based on the notion of “learning by doing”, in other words implementation supplemented by a process of questioning and reflection in order to gain insights both to inform current and future activities and to distil lessons for application elsewhere. This is reflected in the project design, which combines action research at two sites with activities designed to influence policy learning through multi-stakeholder groups at local/state and national levels. The action learning approach is flexible, adaptive and dynamic, such that project activities are modified – within the boundaries of the overall project – when experience and learning suggest this is appropriate.

Site related activities aim to facilitate development of a mechanism to enable transactions based on watershed protection services. Baseline studies at the sites will assess land use and management practices, watershed protection services, and livelihoods. This will help identify options, and continued monitoring will assess any impacts. Research techniques across the sites will be refined at a methodology development workshop, but are likely to include evaluation of income, assets and expenditure patterns to assess wellbeing, appropriate hydrological monitoring for assessing watershed services (silt reduction in Kuhan, water flows in

Bhodi-Suan, and water quality in the Bhoj wetlands catchment), and assessment of land use and management practices to identify changes required to secure the watershed services in question. This will facilitate a comparable approach across all the sites to the extent possible, and thus help in generating comparable information. Site level activities are described in more detail in section 9.

As well as the site-specific studies, a number of strategic studies will be carried out. These will be selected and refined during national learning group meetings according to key issues that emerge, but a preliminary list is given in section 10.

The project methodology also includes learning and communication activities. Specifically, the state and national level learning groups will meet on a regular basis, and a range of information and dissemination activities will take place throughout the project.

A summary of the outputs from the project is provided below in Table 1.

Table 1: Project outputs and summaries

| <i>Output</i> | <i>Description</i> |
|--|---|
| Facilitation | Supplier (upstream) and receiver (downstream) transactions facilitated at three sites. Varying watershed services in different sites (silt control in Kuhan, streamflow in Bhodi-Suan, and nutrient, pesticide and silt load control in Bhoj wetlands). |
| Supporting research & Monitoring | Applied research to monitor livelihood impacts changes in land use and resource management practices and watershed services. Emphasis on linkages between land use practices and watershed services and their impact on wellbeing. Participatory research emphasises comparability across sites and facilitates transactions, impact assessment and feeds into the national learning group. |
| Strategic studies | Focussed studies provide broader evidence of the relevance of incentive-based mechanisms at state and national level. |
| National and state level learning groups | National and state level learning events and activities guide the project and feed back learnings to a broader audience |
| Documentation and dissemination | Studies and lessons learnt from the project are documented and made available to the national network, and sectoral audiences and others via multiple channels, for local, regional, national and international learning. |

9 Site profiles and proposed activities

9.1 The Changar region, Himachal Pradesh

Two sub-500 hectare catchments have been selected in the water-scarce Changar area of Kangra District, Himachal Pradesh. Located in the Shiwalik hills in the southeastern part of Kangra district, the Changar region has typical altitudes in the 500-1200 m range. Unlike the relatively better irrigated northern reaches of the district, where agriculture is sustained by hundreds of gravity-fed irrigation channels which divert water from snow-fed streams, the Changar region is characterised by drinking water scarcity and limited irrigation coverage. In fact, in the local dialect, Changar signifies a remote and rugged terrain prone to water scarcity. The area receives an average annual rainfall of about 1860 mm of which approximately 65 per cent is lost to runoff because of steep slopes and this causes severe soil erosion. With limited irrigation and no major industry or tourism, average income levels are significantly lower than northern parts of the district and are mostly based on small-scale agriculture and animal husbandry. This leads to significant out-migration for jobs in the region.

The region is the focus of the bilateral "Indo-German Changar Eco Development Project" (IGCEDP) in Himachal Pradesh. The project area of 439 km² includes 37 micro-watersheds. These micro-watersheds are further sub-divided into mini-micro watersheds (MMWS). Each MMWS contains four to six villages and covers an area of 300-500 hectares.

After a review of ten sites in the state, two mini-micro watersheds were chosen in the Changar area. They are the Kuhan catchment and the Bhodi-Suan catchment. The site selection criteria for the two catchments are presented in appendix 1. The two catchment profiles, and proposed activities, at each site are presented below.

Both these catchments are located in the Changar area of Himachal Pradesh where the Indo-German Changar Eco-Development Project (IGCEDP) has been working since 1994. The IGCEDP is jointly supported and implemented by the Government of Himachal Pradesh and the German Agency for Technical Cooperation (GTZ). The aim is reduction of ecological degradation in the Changar area, which is to be fulfilled by effecting sustainable change of attitudes and practices related to the management of the natural resources. The project works on watershed management principles to improve natural resource management and to improve local livelihoods. A total of 593 villages have been covered under the project. The project is likely to end in 2004 followed by a two-year withdrawal phase till 2006. Our action-learning project would complement the work of GTZ and would explore ways of sustaining the watershed management effort in selected sites after the withdrawal of IGCEDP.

The *partner organisation* in HP will be the Himachal Pradesh Eco-Development Society (HPEDS), which is the implementing agency for IGCEDP and is a semi-governmental organisation registered under the Societies Registration Act, 1860. The decentralised and autonomous status of HPEDS helped IGCEDP in trying out multi-stakeholder and innovative approaches in decentralised natural resource management, which formed the core of its work. This approach, together with the extensive information gathered on the villages covered under the IGCEDP, makes HPEDS an ideal partner for intensive fieldwork at the local level. HPEDS's role in this project is described in section 13

9.1.1 The Kuhan catchment

The Kuhan catchment is located about 55km from the town of Palampur. It includes three villages namely Oach Kalan, Uperala Kuhan and Kuhan Khas, all of the Kuhan panchayat⁶. Oach Kalan lies in the upper catchment and Kuhan Khas is downstream, with the smaller Uperala Kuhan in the middle. Habitations are spread out in small hamlets: there are seven in Oach Kalan and six in Kuhan Khas. The total catchment area is 343.47 ha and the altitude ranges from 540 to 750m. Less than a third of the area is cultivated (see table 2). The main stream, Gulana Khad, eventually drains into the Beas river. The Indo-German Changar Eco Development Project (IGCEDP) has supported various agricultural and commonland interventions in the catchment, including plantation and soil conservation works, since 2000.

| | Total area | Cultivated land | Culturable wasteland | Hay land | Grazing land | Forest land | Others |
|---------------|------------|-----------------|----------------------|----------|--------------|-------------|--------|
| Oach Kalan | 176.80 | 37.08 | 61.71 | 44.09 | 0.37 | 28.18 | 5.37 |
| Uperala Kuhan | 65.93 | 28.49 | 10.21 | 14.26 | 0.31 | 8.73 | 3.93 |
| Kuhan Khas | 100.74 | 37.37 | 9.47 | 33.68 | 2.03 | 8.81 | 9.38 |

| Population | Total | Men | Women | Boys | Girls |
|---------------|-------|-----|-------|------|-------|
| Oach Kalan | 524 | 204 | 162 | 93 | 65 |
| Uperala Kuhan | 303 | 87 | 84 | 89 | 43 |
| Kuhan Khas | 544 | 189 | 212 | 110 | 136 |

Nature of the problem

The residents of Kuhan Khas have long wanted to utilise the substantial flows in the perennial Gulana Khad to expand irrigated areas in their village. An informal irrigation user group has now installed and is managing a small lift irrigation scheme in Kuhan Khas village since year 2000-2001, with IGCEDP support. The cost of the lift irrigation system (small dam, pump, pipes) was shared between the IGCEDP (75%) and

⁶ Panchayat is the lowest unit of local self government at the village/ village cluster level.

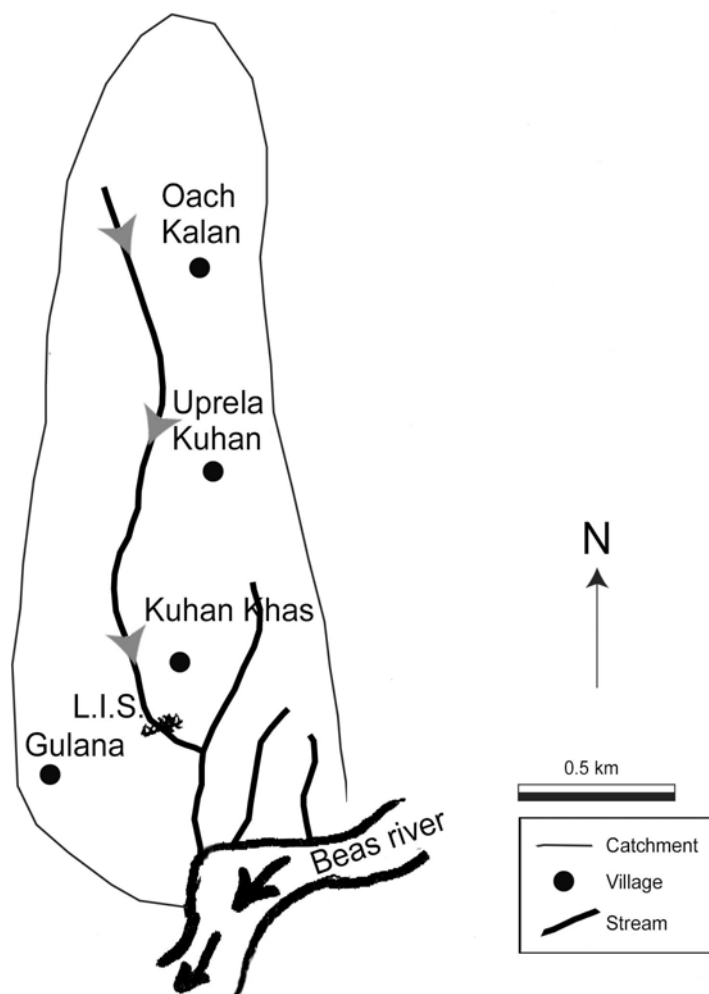
the community (25%). Substantial productivity gains have been made in the recently irrigated area and fifteen farmers are doing vegetable cultivation on a small scale and selling part of their produce locally. Some farmers in the downstream Kuhan Khas have also started vermi-composting, with IGCEDP facilitation. Compost-based vegetable farming has now expanded to a larger group of farmers. The compost approach has also meant that these farmers have avoided the costs of chemical fertilisers and likely increased their returns.⁷

The residents of Kuhan Khas view the lift irrigation scheme as a critical component in their agricultural economy. But high rates of siltation of the small reservoir, from where the water is lifted, have been observed in the first year of its operation. Members of the user committee have donated their labour to partially clean the reservoir. However they recognise that annual cleaning is not sustainable and a long-term sustainable solution to the problem would involve reducing the silt load in the stream. They feel that reduced grazing, protection of commonlands and increasing vegetation cover in the upland catchment could help in reducing the silt load. (This claim will be investigated further through a land use study at the site). In addition they plan to identify any critical areas that are a disproportionate source of erosion. They are willing to consider compensating the upstream residents for their support in upstream catchment protection.

A key upstream user group that is likely to be affected by a land use change is families predominantly dependent on open grazing based animal husbandry. There are seven or eight such families in Uperala Kuhan. Oach Kalan has a larger area under common lands, and concomitantly many more families who depend on common lands for their livelihood .

⁷ The Kuhan irrigation water user group has inspired a few upstream Oach Kalan farmers who have tapped very small seepages of water from a few locations in the upper catchments. This is collected in a storage tank. Farmers transport the stored water to their fields via the equivalent of long garden hoses. Eight farmers of Oach Kalan have started growing vegetables and sell the surplus. While the seepage collected is from the catchment, the volumes collected are insignificant and not likely to impact downstream water quantity.)

Oach Kalan Kuhan Catchment



Map 1: The Kuhan catchment
(Length of catchment, approximately three km)

Proposed activities

The primary activity at this site is intra- and inter-village facilitation; to develop a transaction based mechanism to secure watershed protection services. Meetings will be held as required. The mechanism will include facilitating the stakeholders in developing verifiable direct or indirect indicators of watershed services, identifying suitable payment mechanisms, the institutional framework in which it would operate, an internal and/or external audit mechanism, as well as a method to adjust the various aspects [payment, delivery, verification] of the mechanism.

- Facilitation
 - Regular meetings in the individual villages to discuss and identify options for reducing silt levels and maintaining the flow of water in the Gulana Khad.
 - A series of inter-village interactions to identify any options for changing land management and practices; and for devising institutional and incentive mechanisms to support the sustainability of these changes.
 - Participatory assessment of incremental benefits and costs of any mechanism; identification of gainers and losers.

- Carefully designed exposure visits of a group of upstream and downstream villagers to an area where degraded forest protection has revitalised streams and springs.
- Facilitation of focus group meetings with stakeholders/user groups with special emphasis on livelihoods of less powerful (esp.) upstream stakeholders e.g. the landless. Exploration of mechanisms for incorporating interests of poor stakeholders in sharing benefits and costs equitably.
- Assessment and monitoring
 - *Land use and management practices*: Assess land use and management practices in the catchment and identify major sources of silt and potential change options.
 - *Watershed services*: Monitor basic hydrological parameters (silt, soil infiltration, and flow rates) to develop a baseline and assess any impacts.
 - *Livelihood impacts*: Assess basic economic wellbeing (e.g. assets and income) at the beginning and end of the project to develop a baseline and evaluate impacts. Identify potential benefits and opportunity costs of any land use change to help design a transaction around it.
- Anticipated outcomes
 - Interaction between villagers and evidence from studies leads to conditions necessary for the development of a compensation mechanism between upstream and downstream villages, changes in land use, and reduction in silt load in the stream and in siltation of the dam.

9.1.2 Bhodi-Suan catchment

The Bhodi-Suan catchment consists of 441.3 hectares with clear ridgelines from northern, eastern and western sides sloping towards the south. Elevation in the watershed varies from 730 to 1100m. Four villages - namely Bhodi, Kharjar, Suan and Ropri - are situated in this MMWS in a sequence from upstream to downstream, as shown in the map below. The main stream draining this watershed is the Suan Nala, which originates from the Bhodi caves in highest upper reaches. IGCEDP supported plantation and soil conservation activities in this watershed from 1994 to 1999.

Table 4: Village area and population statistics for the Bhodi-Suan catchment

| Village | Village area (ha) | Other area* (ha) | Total area | Total households | Total population | Male | Female | Scheduled Castes |
|---------|-------------------|------------------|------------|------------------|------------------|------|--------|------------------|
| Bhodi | 114 | 15 | 129 | 24 | 72 | 27 | 45 | 0 |
| Kharjar | 35 | 37 | 72 | 24 | 112 | 56 | 56 | 20 |
| Suan | 95 | 50 | 145 | 64 | 267 | 121 | 146 | 7 |
| Ropri | 75 | 25 | 100 | 80 | 430 | 192 | 243 | 55 |
| Total | 319 | 127 | 446 | 192 | 881 | 396 | 490 | 82 |

* The other areas include land belonging to villages Maharajnagar and Jareth falling within the general Suan MMWS.

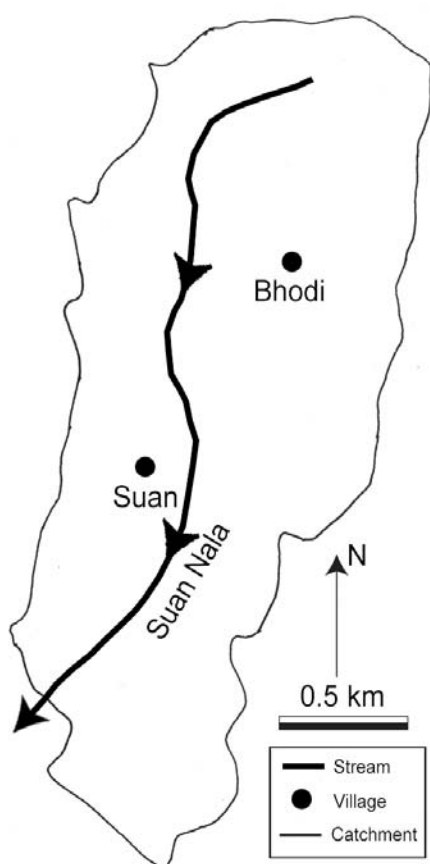
The nature of the problem

Villagers in Suan faced a serious water scarcity in the mid-1990s. At that time they traced the problem to grazing and resource extraction on degraded and open access land in the upstream village of Bhodi. With support from the IGCEDP they undertook plantation and soil conservation activities in a portion of the upper catchment. To provide an incentive for the residents of Bhodi, the Suan residents provided free labour for plantation activities in the Bhodi catchment. This transaction in kind, and additional soil and water conservation activities in the catchment, have reduced soil erosion and improved water flows in Suan nala, and also improved spring recharge in the catchment. It may therefore be said that the watershed services in terms of control of soil erosion and increased water availability for Suan laid the foundation for cooperating with Bhodi in the implementation of various activities as well as protection of plantations in catchments. The Bhodi residents, while sceptical initially as they would lose some grazing lands, also benefited from substantially increased resources of fodder and fuelwood. More recently, Suan villages have helped their neighbours in Bhodi to resolve grazing conflicts which Bhodi villagers were experiencing due to grazing pressure from a third village.

Residents in Suan would now like to irrigate a portion of their agricultural lands. Though increased flow in the Suan stream (on surface and its sub bed) has been noticed the flow is barely sufficient in the summer months to support a small-scale irrigation scheme. The village of Suan is planning to invest in a lift irrigation scheme with public investment and village contribution. However, they recognise that to optimise the benefits of the irrigation supply, they need to increase the protection in the upper catchment of Bhodi to increase the summer water supply as well as further reduce silt loads in the Suan Nala.

There are traditional organisations like Gram Sabha, Mahila Mandals, and Youth clubs in the villages and these are actively taking part in the development work as well as an active gram panchayat. In addition, Village Development Committees (VDCs), formed with the support of IGCEDP, continue to exist in each village, despite the project having withdrawn from these villages in 1999. Basic hydrological data including spring recharge and streamflow was collected during the first phase of IGCEDP's work between 1995-99. Socio-economic data on demographics, assets, and income sources is also available.

Bhodi - Suan Catchment



Map 2: the Bhodi-Suan catchment
(Length of catchment, approximately three km)

Proposed activities

Intra- and inter-village facilitation to develop a transaction based mechanism to secure watershed protection services is the primary activity at this site. Meetings will be held as required. Activities will include facilitating the stakeholders in developing verifiable direct or indirect indicators of watershed services, identifying the payment mechanisms, the institutional framework in which it would operate, an internal and/or external audit mechanism, as well as a method to adjust the various aspects of the [payment, delivery, verification] mechanism.

- Facilitation

- Regular meetings in the individual villages to identify options for maintaining and increasing flow of water in the Suan Nala.
 - Exposure visits to an area where forest protection has revitalised streams and springs
 - A series of inter-village interactions to identify any land use change options; and institutional and incentive mechanisms to support the sustainability of these options.
 - Focus group meetings with stakeholders/user groups with emphasis on livelihoods of less powerful (esp.) upstream stakeholders e.g. the landless. Exploration of mechanisms for incorporating interests of poor stakeholders in sharing benefits and costs.
- Assessment and monitoring
 - *Land use and management practices*: Basic participatory catchment assessment to identify potential land use and management change options.
 - *Watershed services*: Hydrological data collection to develop a baseline and assess impacts
 - *Economic wellbeing*: Assessment of income levels, assets, employment and other indicators of economic wellbeing, and potential benefits and opportunity costs of the proposed change.
 - Anticipated outcomes
 - Interaction between villagers and evidence from studies leads to conditions necessary for the development of a compensation mechanism between upstream and downstream villages, changes in land use, improved stream flow in summer.

9.2 Madhya Pradesh

In Madhya Pradesh twelve sites were identified for assessment. The site selection matrix is given in appendix 2. After reviewing each site against the criteria, one site was selected - the Bhoj wetlands macro site around Bhopal city. The site profile and proposed facilitation and supportive research activities are discussed below.

9.2.1 Bhoj wetlands, Bhopal

Bhopal, with a population of about 1.5 million, is the capital city of Madhya Pradesh, India's second largest state. Bhopal is internationally well known for the tragic chemical disaster (poisonous gas leakage) that took place in 1984. Few people know that Bhopal also has wetlands of international importance. These wetlands – called the Bhoj wetlands – consist of two man-made reservoirs, which are simply termed the Upper Lake and the Lower Lake. Constructed in the 11th century by King Bhoj of Dhar, the Upper Lake was created by building an earthen dam across the Kolans River. It has a catchment area of 361 km² and water spread of 31 km². While its catchment areas are predominantly rural, there are some urban areas in the catchment as well (see map). The local ruler created the Lower Lake in 1794. It has a catchment area of 9.6 km² and water spread of 1.29 km². It receives water from the Upper Lake through seepage as well as from its catchment areas, which are mainly urban.

The Bhoj wetlands are an important source of drinking water and recreation for the residents of Bhopal. The Upper Lake provides about 40% of the city's drinking water, about 29 million gallons per day. There are boating and water sports facilities in both lakes.

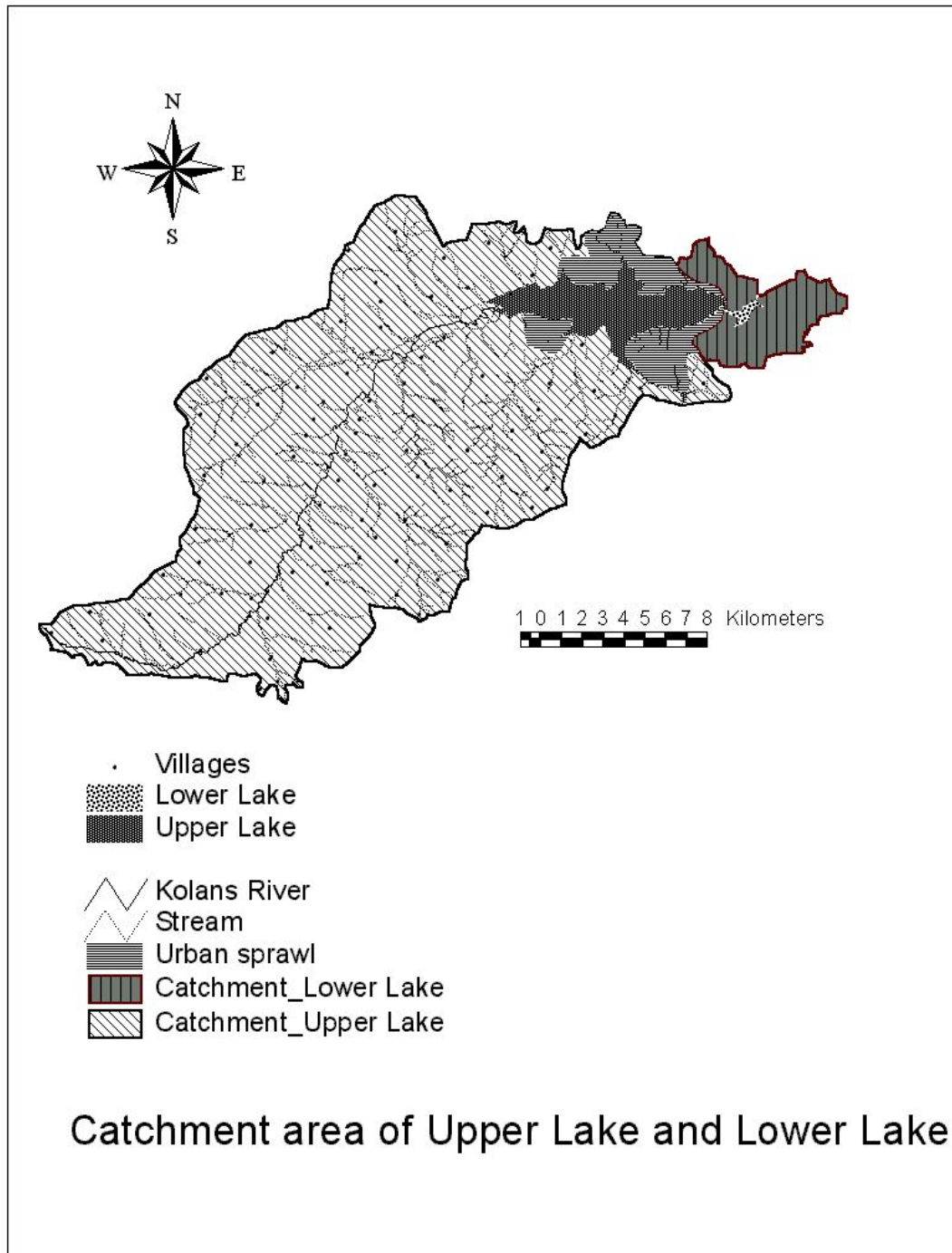
The wetlands also support a wide variety of flora and fauna. Several species of phyto and zooplankton, macrophytes, aquatic insects, amphibians, fishes and birds (resident as well as migratory) are found in these wetlands. Over 160 species of birds and 14 rare macrophytes have been reported from the area. Considering its ecological importance, the Government of India has declared the area as a *Ramsar Site*.⁸

Livelihoods of many people are directly linked to the wetlands. A fishermen's co-operative consisting of some 500 fishermen's families has been given fishing rights on long lease by the local authorities. Some

⁸ A *Ramsar Site* is a wetland that has been designated as internationally important according to a set of criteria under the terms of the (Ramsar) Convention on Wetlands, by the Administrative Authority of the Contracting Party State (www.wetlands.org/RSDB/default.htm).

people grow water chestnut in the wetlands, for sale locally. Many washer-men were also dependent on the wetlands but washing areas have been recently shifted to another site to reduce detergent pollution.

The wetlands have high cultural value as well. The *Mazaar* (tomb of a Muslim saint) of Shah Ali Shah Rahamatulla Alliah, which has religious significance, is located on Takia Island – a small island in the Upper Lake.



Map 3 Catchment are of Bhoj wetlands (Upper lake and Lower Lake)

The nature of the problem

The Bhoj wetlands are facing twin problems of deteriorating water quality and reduction in storage capacity due to siltation. The water quality is being affected by a number of factors such as inflow of sewage and solid waste from the urban areas and run off from agriculture farms in the peri-urban/ rural catchment. In recent years, a number of steps have been taken to control pollution from sewage and solid waste generated mainly in the urban areas. The city's sewage treatment infrastructure has been strengthened. Over 85 kilometres of new sewage pipes have been laid. Ten pump houses and four sewage treatment plants have been constructed for diversion and treatment of 56 million litres of sewage per day. A *dhobi ghat* (washermen's work area) has been shifted from the Lower Lake to an alternative site outside the catchment. All these activities have been carried out under a project funded by the Japanese Bank for International Cooperation (see next section). While there are still problems related to sewage and solid waste inflow⁹, the above-mentioned interventions have significantly reduced the threat to the water quality of the wetlands from these sources. These problems are likely to reduce further as more and more people connect to the sewage system.

The problems related to agriculture runoff, on the other hand, have not been addressed so far. There are 87 villages in the catchment of the Upper Lake in the Bhopal and Sehore Districts and the major part of the catchment is under agriculture. There are problems of nutrient (mainly nitrate and phosphate) and pesticide run off and soil erosion leading to pollution as well as siltation of the wetlands. Due to increasing use of chemical fertilisers and pesticides for crops such as wheat and soyabean, pollution due to agriculture runoff has increased in recent years. Regular tilling of soil for agriculture and non-availability of proper field bunds leads to erosion of topsoil, which flows into the lakes, especially during the monsoon season. The siltation rate is estimated to range between 1 to 2.58 cm per annum. The importance of addressing agriculture related problems can be gauged from the fact that over 60% of the catchment of the Upper Lake is cropland.

Agriculture is the main source of livelihood for people in the villages in the catchment of the Bhoj wetlands and most farmers have small landholdings of only a few acres. Keeping with the trend in many other parts of the country, use of chemical fertilisers and pesticides has increased over the years and most farmers have also shifted from subsistence crops to cash crops. In recent years, some farmers have tried to replace chemical fertilisers with organic compost with encouraging results. Most farmers have, however, preferred to continue with chemical fertilisers and pesticides, as they do not want to take the risk of trying new management practices.

Unless steps are taken to address the issue of agriculture run off, the water quality as well as storage capacity of the Bhoj wetlands is likely to deteriorate further. The quality of drinking water will be further affected (and thus public health), as will flora and fauna, the livelihoods of fishermen and the recreational value of the wetlands.

Efforts to date

The most significant effort to conserve the wetlands and improve their management has been through the "Lakes Bhopal Conservation and Management Project", popularly called Bhoj Wetland Project and implemented between April 1995 and June 2004. The Environmental Planning and Coordination Organisation (EPCO) implemented this project, on behalf of the Housing and Environment Department of Madhya Pradesh. The total project cost was Rs 2,470.20 million (GBP 30.88 million), out of which Rs 370.5 million was provided by the Government of Madhya Pradesh, and the rest of the cost was met through a loan from the Japan Bank for International Cooperation. Various major activities were carried out under this project to control pollution and siltation in the Bhoj Wetlands; these are listed in Box 4.

Box 4: Lakes Bhopal Conservation and Management project: main activities

- *Desilting and dredging* (2.7 million m³ of silt was removed from the Upper Lake and 85,000 m³ was

⁹ For instance, many houses are not yet linked to the sewerage system and several idols are immersed in the wetlands during festivals.

removed from the Lower Lake)

- *Deepening and widening of the spill channel* (to reduce the chances of floods)
- *Restoration of Takia Island* (to reduce erosion)
- *Catchment area treatment* (construction of 75 check dams and 2 silt traps)
- *Construction of Retghat-Lalghati road and Promenade* (creation of a buffer against urban intervention in the Upper Lake and for recreational purposes)
- *Construction of Bridge across Bhadbada Channel* (to relieve Bhadbada weir from traffic load)
- *Fringe area protection* (plantation of over 1,000 ha to create a buffer zone)
- *Solid waste management*
- *Prevention of pollution from Dhobi Ghat*
- *Development of infrastructure for diversion and treatment of sewage*
- *Weed control and installation of floating fountains* (to reduce nutrient load and oxygenate water)
- *Setting up a laboratory for water quality monitoring*
- *Setting up an Interpretation Centre* (to raise awareness about conservation of wetlands among the general public)

The Lakes Bhopal Conservation and Management Project has played a significant role in reducing the pollution threat from urban areas, and some engineering structures and a buffer zone vegetation belt have helped to control silt inflow from rural areas. However, as nutrient as well pesticide pollutants are water soluble, these structures have not addressed the problem of such pollution from agricultural fields in the catchment. As the Lakes Bhopal Conservation and Management project has ended, it is no longer possible to invest large sums of money in engineering solutions to control pollution from agriculture farms.

Change in management practices in the agriculture farms in the upstream could be a more cost-effective and sustainable solution to the problem of agriculture run off related pollution and siltation in the wetlands. This may be tackled by promoting wetland friendly agriculture practices, building on the encouraging results obtained by pilot studies promoting organic compost as a replacement for chemical fertilisers under the Lakes project. Thus our action-learning project would complement the work already carried out by developing a mechanism that secures finances from urban lake beneficiaries and invests them in the agricultural activities in the catchment, whilst trying to reduce the use of chemical fertilisers and pesticides, especially by small farmers.

Our *partner* for the Bhoj wetlands study is the Lake Conservation Authority, which has been created recently (2004) by the Government of Madhya Pradesh to sustain the Bhoj Wetlands Project efforts and to initiate holistic conservation and management of other lakes in the state. It is responsible for regular monitoring of the status of ecological health of the lakes. It is also responsible for the preparation of inventories of flora and fauna and for increasing awareness at various levels regarding the need for conservation of lakes in the state. However, it does not have any regulatory powers.

The Lake Conservation Authority has a modern laboratory and monitors various parameters of water quality such as pH, total dissolved solids, hardness, biological oxygen demand, chemical oxygen demand, nitrate, phosphate, organic carbon, heavy metals and pesticides. While currently, monitoring efforts are concentrated on the water in the two lakes, under the action research project monitoring of specific streams and agriculture run off from the target villages is proposed. LCAs role in this project is described in section 13.

Proposed activities

The main focus of the action-learning project will be on the development of a mechanism through which payments can be generated from the 'receivers' of the watershed services and channelled to the 'suppliers' in the catchment for improving agriculture management practices. Institutional structures and norms will be developed to ensure transparency in all transactions. Criteria for targeting collected resources to farmers in the catchment will be developed (on the basis of need as well as relative importance for the watershed service). Mechanisms for monitoring and reporting changes in the watershed service will also be developed.

The following activities are proposed to support the development of such a mechanism:

- *Identification of key 'suppliers'*: A survey will be undertaken to identify villages in the catchment that have the highest impact on the wetland in terms of nutrient and pesticide pollution and silt. Once the villages are identified, a detailed survey (PRA as well as questionnaire based) will be undertaken in each village to identify households in different socio-economic classes.
- *Identification of key 'receivers'*: A survey will be undertaken to identify key stakeholders that will benefit from improvement of water quality and storage capacity of the Bhoj wetlands. While many direct 'receivers' such as domestic and commercial water consumers or fishermen have already been identified, an attempt will be made to identify indirect users having a stake in the wetlands such as hotels, tour operators, conservation organisations, etc.
- *Generation of voluntary payments*: An awareness campaign will be launched to sensitise the 'receivers' to the urgent need to address issues of pollution and siltation (through presentations, media campaign, one-to-one meetings, etc.). Receivers such as corporate houses and institutions located in Bhopal, conservation organisations, tour operators and hotels will be approached to make voluntary payments for promoting wetland friendly practices (e.g. use of organic compost instead of chemical fertilisers).
- *Water surcharge*: The possibility of adding a surcharge to the water bill of the users will be explored with the Bhopal Municipal Corporation and other state agencies such as the Public Health Engineering Department.
- *Generating awareness about wetland-friendly agriculture practices among farmers in the catchment*: Farmers in the identified villages in the catchment of the Bhoj wetlands will be made aware of various management practices that can reduce pollution and siltation of the wetlands. This will be done through village level awareness camps, practical training programmes, exposure visits and by promoting interaction of farmers with those farmers in the area who have adopted/ tried practices such as organic compost, safer pesticides/herbicides, improved tilling practices, etc. The State Agriculture Department will be actively involved in this activity and an initial discussion with the local Agriculture Officer has been held and he has assured cooperation.
- *Support to individual farmers*: An institutional mechanism will be developed through which poor farmers, who are unable to adopt wetland friendly management practices on their own will be supported from the payments collected from the 'receivers' to adopt wetland friendly practices. These could be one-time or regular payments, or some other innovative transaction in kind, depending on the need of the farmers. Care will be taken to target the poorest and most needy farmers, which will be identified in the initial survey.

Monitoring impacts of the intervention

Three studies will be carried out to assess the impact of project interventions on land use and management practices in the target villages and its further impact on watershed services and livelihoods, especially of the poor farmers. Under each study, data will be collected at the beginning (baseline) and end of the project. However, it is acknowledged that significant changes are unlikely to be evident within the limited timeframe of this project; rather, the conditions will be established under which longer-term change can take place.

- *Land use and management practices study*: The land use pattern (including different agriculture crops grown in different seasons) as well as various agriculture management practices (e.g. use of chemical fertilisers vs. organic compost) of the target villages will be assessed.
- *Watershed services study*: The streams flowing out of target villages will be studied at regular intervals to ascertain the level of nutrients, pesticides and silt in the run off coming from agriculture fields, especially in the rainy season.
- *Livelihood impacts study*: The impact of change in agriculture cropping pattern or management practices on the livelihood of different categories of farmers will be analysed. Separate assessments will be made for large, medium and small farmers and landless agriculture workers.

Anticipated outcomes

- Interaction with farmers and urban users in Bhopal leads to development of an institutional mechanism for channelling payments to improve land management practices in the catchment, which, in turn, improves water quality in the lake.

10 Strategic studies

A few carefully selected studies with a focus wider than the site-oriented research will support the project goal. They will focus on the specific themes such as governance and regulatory environment for specific sectors - e.g. the regulation mandated payments in large-scale hydro and dam projects, and learning from earlier incentive oriented mechanisms. These studies will provide the basis for evidence-based debate at state level working group meetings and the national level learning group. Most studies will be undertaken by or supported by external consultants. Feedback on the terms of reference will be sought from experts [and members of the learning group] prior to commissioning the studies, as well as on draft reports. These topics will be presented at the first learning group meeting and feedback obtained. The strategic studies will include a study of the efficacy of regulatory payments made by hydro-projects for Catchment Area Treatment.

- *Efficacy of the regulatory payments made by hydro projects for Catchment Area Treatment*

Hydro projects are required to prepare Catchment Area Treatment (CAT) plans and pay state governments for CAT plan implementation. These payments are mandated by the Environment Protection Act and their modalities have been modified by successive Supreme Court judgements. While large sums of money are required to be paid by hydro companies to the government, actual investment in the catchment and the impact of activities carried out (e.g. tree planting) on watershed protection services has not been systematically assessed so far. The study will track the generic process of project clearance, and CAT plan preparation, funding and implementation. Few case studies of selected projects, in both the private and public sector, will be prepared to assess the peculiarities of each case vis-à-vis the generic process. Finally it will assess the scope for introducing incentive-based mechanisms in the project approval and implementation phases.

Further topics for the strategic studies are likely to be drawn from the following:

- *Incentive-based mechanisms for watershed protection services: Governance requirements*
- *Collating a database of and reviewing experience with incentives for environmental services type mechanisms*
- *Opportunities for improving quality and quantity of water supplies for urban water supply schemes via incentive based mechanisms for watershed protection*
- *Developing Scenarios via the Environmental Services Trading Simulation (ESTS) software*
- *Vegetation-water linkages at micro-catchment level: A review of literature and experience in India*

11 National and state level learning network activities

The national learning network provides a mechanism for evidence-based discussion of the relevance of the concept of incentive mechanisms in the Indian context, and of project findings. It also engages decision makers and policy makers. A national level learning group of 12 to 15 people, with additional invitees (for specific sessions) will meet half yearly and provide the primary vehicle to give feedback to the project and utilise findings. Careful constitution of the national level working group and state level meetings with policymakers will facilitate early engagement of policymakers, and their inputs will inform the facilitation as well as the choice of topics and the design of the research studies. Involving key policy members in the learning network in the early stages will also facilitate uptake of learnings at the policy level.

A meeting of the national level learning group in July 2004 provided initial feedback on the project. Three additional meetings are planned during the remaining project period. Project information will be distributed to learning group members before and during the meetings and proceedings will be reported on the project web-link and circulated to a larger group.

States legislate, regulate, and spend, on a variety of environmental and natural resource issues. Given the specificity of state policies, periodic state level working group meetings will be held in each state to engage policy makers across various government departments and institutions. The first state level meeting took

place in Himachal Pradesh in October 2004, jointly with a RUPES¹⁰ project on awareness generation also being implemented by WII. In Madhya Pradesh the first meeting is planned in the first quarter of 2005 in collaboration with LCA.

Specific seminars will be held during the project. Topics will be developed in consultation with state working group meetings and the national learning group members. A likely topic is incentivising environmental payments by hydroelectric and irrigation dams. Seminars will be held opportunistically, in the national and state capitals as well as closer to the sites, e.g. in Palampur, a town near the HP field sites. Some seminars will target general audiences. Other special audience oriented seminars, or presentations in sectoral meetings will allow us to target audiences like participatory watershed management practitioners, urban water supply agencies, municipal corporations, environmental managers of hydro-electric project companies.

A workshop to discuss the learnings and their policy implications is planned at the end of the project period. This workshop will be staggered, with different days/ sessions for the project team, the learning group, as well as other key people we want to inform in industry, government, and civil society.

12 Documentation, networking, communications and dissemination activities

Given that the concept of incentive-based mechanisms and payments for environmental services is relatively new in India, and this project will be among the first pilot action learning experiences in the country, documentation of learnings, networking, communications and information dissemination will be critical to its success.

Outputs from process documentation, site oriented and broader studies will provide the basic learning material from the project. A combination of media is suggested in order to ensure maximum impact among policy makers to institutionalise the approach at a larger scale as well as among other institutions working on the same issues. This will include:

- Project website: a basic website for the project has been established (http://www.winrockindia.org/nrm/ibms_wps.html). The purpose of the website is to share information on findings and learning from the action learning as it progresses, and also provide space for research on the theme of incentive-based mechanisms being undertaken by other individuals and organisations in the country. In addition it will provide an internal space for users to share interim outputs. It will be linked to IIED's project website.
- Working papers: the results of the project will also be analysed thematically and, together with the crosscutting studies, collected into a series of working papers, for wider dissemination.
- Seminars aimed at specific sectors and stakeholders involved in the process of negotiating payments for environmental services will be held in order to facilitate focused discussions on issues which arise when implementing such an approach.
- Electronic briefings and newsletters. Findings from this work will also contribute to international electronic newsletters through IIED, and it is likely that email bulletins will be issued by WII.

13 Management, team structure and partnerships

This project will be coordinated by Winrock International India (WII) in collaboration with IIED. WII is based in New Delhi, India and specialises in policy analysis and implementation in the fields of natural resource management, energy and climate change. Within WII, the project will be carried out by a multi-disciplinary team in the Natural Resource Management division. The action learning components will be undertaken jointly with partner organisations with a strong local presence at each site (see Table 5). The Himachal Pradesh Eco-Development Society (HPEDS) (in HP) and the Lake Conservation Authority (LCA)

¹⁰ WII has undertaken an awareness generation exercise at the grassroots, state, and national levels. At the grassroots level, the medium of street theatre was used to promote the concept of Rewarding Upland Poor for Environmental Services (RUPES), in the ecodevelopment zone of the Great Himalayan National Park (GHNP), Kulu, in the state of HP. The RUPES program is being implemented in upland areas of selected countries in Asia. Additional information at: www.worldagroforestrycentre.org/sea/Networks/RUPES/Index.htm

(in MP) are both autonomous societies set up by the respective state governments with specific mandates. HPEDS has a strong field presence with four field offices. It will take the lead in local facilitation with active backstopping from WII. LCA will take the lead in monitoring watershed services and promotion of wetland friendly activities. The project management team consists of WII and partner staff on the project. The LCA has a hydrologist on staff. The HPEDS has a watershed specialist, with experience of low cost hydrological monitoring. The project team will be supported by an environmental economist, Dr Madhu Verma, from the Indian Institute of Forest Management (IIFM). Additional advisors and technical experts will be contracted on demand.

Table 5 List of team members

| <i>Organisation</i> | <i>Name</i> | <i>Skills/ role in project</i> |
|---------------------|------------------------|---|
| WII | Chetan Agarwal | Project coordinator & coordination of site level work in HP |
| | Sushil Saigal | Coordination of site level work in MP |
| | Anshuman Verma | Coordination of livelihood studies |
| | Alok Dhuria | Field level coordination – MP |
| | Satyaprasanna | Field level coordination – HP |
| | Sunandan Tiwari | Coordination of watershed services studies |
| HPEDS (for HP) | TD Sharma/ Rajan Kotru | Key contact people in HPEDS |
| | Pradip Kumar | Coordinator & Watershed specialist - |
| | Sanjeev Sharma | Water shed & institutional development |
| | Vijay Guleria | Social mobilisation & institutional development |
| LCA (for MP) | Aniruddhe Mukerjee | Key contact person in LCA |
| | Dr Pradip Nandi | Coordinator |
| | Dr Sachdeva | Hydrologist |
| | Dr Mishra | Water Quality Assessment |
| | Alok Nayak | Coordinator - village level farmer interaction |
| IIFM | Dr Madhu Verma | Environmental economics: specialist advice |

14 Links with other initiatives

At all sites, the action research work is closely linked to and builds upon existing programmes: as described above, this includes the IGCEDP in Himachal Pradesh and the Lakes Bhopal Conservation and Management Project in Madhya Pradesh. There are several other initiatives in HP and MP which have broad sectoral relevance to this action-learning project: see appendix 3 for further details.

DFID has a presence in both MP and HP. MP is one of four priority states for DFID lending and support in India, while DFID is also supporting the forestry sector reform in HP. In HP, the Himachal Pradesh Forest Sector Reform Project aims to sustain rural forest based livelihoods and increase forest activity based employment. DFID in MP has identified five priority areas, in which one is support for work to improve livelihood opportunities, to move towards the goal of supporting poverty eradication and helping people (particularly the poorest and most vulnerable) to gain access to improved services and opportunities. Under this priority area DFID is supporting efforts to mitigate rural poverty through improved agriculture and non-farm activities. Support is being provided to three districts under Western India Rainfed Programme and complementing the effort through Madhya Pradesh Rural Livelihoods Project (MPRLP) in seven districts. Other support includes the UNICEF drought relief Programme (GBP 7.46 million) and also natural resource regeneration in Bundelkhand region of UP and MP (GBP 1.17 million).

Links with the DFID projects and other relevant programmes will be developed further as the project progresses.

15 Assumptions

- Continued widespread interest in finding innovative mechanisms for promoting improved livelihoods in watersheds.
- Policy environment remains favourable for testing incentive-based approaches for watershed protection
- Mandates and roles of key partners do not alter substantially during the course of the project.
- Policy makers and programme coordinators are responsive to recommendations and implement findings.
- Common understanding develops at all sites, of the linkage the watershed service and the upstream catchment and the necessity for watershed protection.
- National and state policy climate remains favourable to incentive-based mechanisms for watershed protection. Project results in the identification of transferable lessons and methods

16 Further information

Further information on this project is available from Chetan Agarwal at Winrock International India (chetan@winrockindia.org) and Elaine Morrison at the International Institute for Environment and Development (Elaine.Morrison@iied.org). Please also see the project websites at (http://www.winrockindia.org/nrm/ibms_wps.html) and www.iied.org/forestry/research/projects/water.html.

Appendix 1 Site criteria matrix for Himachal Pradesh

| Selection Criteria | The Kuhan catchment | Suan Nala in the Bhodi-Suan Catchment |
|---|--|--|
| Watershed service related to land use is clearly discernable | High silt levels in the local stream is attributed to grazing and lack of protection in the upstream catchment | Previous improvements in stream flow and spring recharge are directly attributed to protection and treatment of a part of the upstream catchment. |
| Clear watershed service supplier (u/s) and receiver (d/s) | Oach kalan village (upstream), that is partially protecting their commonlands, and the Kuhan Khas village (downstream), which lifts water for irrigation from the <i>Gulana Khad</i> . | Yes. Bhodi village in the upper catchment, which is protecting part of their commons, and Suan downstream, which expects to increase summer, flows in the Suan Nala. |
| Receivers (d/s) are facing or likely to face major problems | The Water Users committee of Kuhan Khas village fears siltation of their dam, from where they lift water for irrigation of vegetables crops for sale. They have partially de-silted the dam once and feel that the problem will get intensified in the future. | Low summer flows in Suan Nala affect the viability of any proposed lift irrigation scheme for Suan residents. |
| Solutions of problems lie in upstream area | The silt load in the stream originates from the upper catchment in Oach Kalan village. | Changes in land management practices upstream will affect water discharge in the Suan nala. |
| Suppliers and receivers are located in reasonably close proximity | The villages of Oach Kalan and Kuhan Khas are close by, about 2 km away. | Yes, in the same catchment of less than 500 ha |
| Willingness among both upstream and downstream communities | Both upstream and downstream villages are concerned about forest degradation. The upstream village is already protecting some commonlands. | Suan have helped Bhodi in the past in plantation activities and more recently, in combating grazing pressure from outside villages. |
| Watershed service receiver willing to pay | The Water user committee in Kuhan Khas has indicated a willingness to make some contribution for a verifiable action taken by residents of Oach Kalan to reduce silt. | Suan folks are willing to pay upstream for improved water flows that they can lift up. ¹¹ |
| No conflicts between u/s & d/s stakeholders | No serious conflicts are reported. Villages are related through kinship ties and are in the same panchayat. | No major conflicts are reported. |
| “Win-Win” situation for suppliers and receivers | Reduced siltation will lead to avoided labour costs and increased irrigation area for Kuhan khas, and improved vegetation status and attendant fuelwood and fodder flows for Oach Kalan. | Improved water flows and potential for irrigation for Suan and fodder material flows for Bhodi. |

¹¹ The emergence and sustainability of any payment mechanism is likely contingent on the installation of an pumping system to lift the water, which will allow them to harness any surplus water for irrigation. The villagers feel that a mechanism that facilitates land use change in the upper catchment will improve base water flows in the summer.

| | | |
|--|--|---|
| Possibility of cooperation with Line Departments and other key organizations | Excellent relation of local partner with its parent department -the Forest Department. As the entire catchment is in one village panchayat, the panchayats support should be easier to obtain. | Partner has good links with several government departments, its parent Forest Department, as well as Irrigation and Public Health Dept., and Panchayati Raj. |
| Watershed service can be 'bundled' with other services | There will be a direct positive impact of commonland protection on biodiversity. Increased material flows of fuelwood, fodder etc will benefit the upstream village as well. | There will be a direct positive impact of commonland protection on biodiversity. Increased material flows of fuelwood, fodder etc will benefit the upstream village as well. |
| Presence of a facilitative organization | The partner organisation HPEDS, which implements the IGCEDP in Changar, has been working in 593 villages in the Changar area over the last 10 years. | |
| Suppliers and receivers are organized | In addition to their constitutionally mandated panchayat, both villages also have active Village Development Committees (VDCs), supported by the IGCEDP. | Panchayats are active. Village Development Committees (VDCs), are active in the downstream village. |
| Transactions between suppliers and receivers exist | Good relations indicate potential. Some sale of vegetables between villages. | Yes. Suan residents had contributed labour for plantation activity in Bhodi. This contribution was made for the expected environmental benefits to improve water flows for Suan residents downstream. |
| Presence of traditional social linkages and mechanisms | Yes, the villages have kinship ties among themselves. | Yes, the villages have social and kinship ties among themselves |
| Existence of base-line hydrological data | Basic and recent fortnightly stream flow and spring recharge data available, since mid-2003, collected by the partner, using low-cost manual methods. Local appreciation of changes in upstream land use, and stream flow over time. | Basic fortnightly stream flow and spring recharge data is available for the last few years, collected by the partner, using low-cost manual methods. |

Appendix 2 Site criteria matrix for Madhya Pradesh

| Selection Criteria | The Bhoj Wetlands |
|--|---|
| Watershed service related to land use is clearly discernable | Land management and agriculture practices in 61 villages in its catchment affect water quality in the Bhoj Wetlands. |
| Clear watershed service supplier (u/s) and receiver (d/s) | Farmers in 61 villages located in catchment are suppliers. Citizens of Bhopal who use lake water for drinking purpose, fishermen, tourists and people interested in conservation of the wetland's biodiversity are receivers. Organisations such as Bhopal Municipal Corporation represent receivers such as consumers of drinking water from the Bhoj Wetlands. Mention any organisations representing fishermen, conservationists |
| Receivers (d/s) are facing or likely to face major problems | Nutrient loading and pesticide pollution and siltation of the Upper and Lower Lake. The main nutrient problems are of excess nitrogen and to a lesser extent, phosphorus. This leads to excessive plant growth. Pesticide and chemical loads are also thought to affect fish. |
| Solutions of problems lie in upstream area | Improvement in water quality of the lake as well as reduction of silt load will require changes in agriculture and land management practices in upstream villages. |
| Suppliers and receivers are located in reasonably close proximity | The catchment of 361 sq. km is adjacent to the lake and includes 61 villages. Receivers are mostly residents of Bhopal city. |
| Willingness among both upstream and downstream communities | Organisations such as Lake Conservation Authority are interested in promoting better agriculture practices such as use of organic compost. Farmers are also willing to shift to these practices if technical support is provided. Pilots to replace chemical fertilisers with organic compost have been reasonably successful. |
| Watershed service receiver willing to pay | Some corporate houses and institutions based in Bhopal have shown interest. A 'willingness to pay' study carried out by the Indian Institute of Forest Management indicated that there is willingness to pay among citizens of Bhopal to conserve the Bhoj Wetlands for their recreational value. |
| No conflicts between u/s & d/s stakeholders | No major conflicts are reported. |
| "Win-Win" situation for suppliers and receivers | Due to increasing prices of chemical fertilisers (due to reduction in subsidies among other reasons) and possibility of at maintaining production levels with organic compost, a win-win situation is possible. Potential certification of organic farming and access to niche markets holds the promise to make organic farming financially viable for the farmers |
| Possibility of cooperation with Line Departments and other key organizations | There is good possibility of obtaining cooperation from Agriculture Department, Housing and Environment Department, Public Health Engineering Department, Forest Department and Bhopal Municipal Corporation as all of them have similar objectives. Potential partner – LCA – already has good contacts with these agencies. |
| Watershed service can be 'bundled' with other services | Yes. Watershed service is closely linked to biodiversity conservation (it's a Ramsar Site) as well as recreation (tourism). |
| Presence of a facilitative organization | Yes. LCA based in Bhopal has a mandate to conserve the lakes and to improve their management. |
| Suppliers and receivers are organized | Not yet. |
| Transactions between suppliers and receivers exist | Not yet. |

| | |
|--|--|
| Presence of traditional social linkages and mechanisms | Not much. |
| Existence of baseline hydrological data | Yes. Studies have been conducted under the “Lakes Bhopal Conservation & Management Project”. There are 28 water quality monitoring stations around the Bhoj Wetlands that are operated by LCA. The LCA undertakes monthly and quarterly monitoring of a large number of variables. |

Appendix 3 State, national and international programmes

| <i>Name of project</i> | <i>Major activities</i> | <i>Funding</i> | <i>Objectives</i> |
|---|--|---|--|
| Madhya Pradesh Rural Livelihoods Project | This project is ongoing in six districts of Madhya Pradesh namely Jhabua, Dhar, Badwani, Shadol, Mandla and Dindori. This project has focus on tribal districts and aims at enhancing livelihoods of poor. | GBP 16.4 million commitment (DFID) | To sustainably enhance the livelihoods of poor rural people implemented in tribal districts of Madhya Pradesh through effective programmes and policies. |
| Western India Rainfed Farming Project Phase I, II | The project works in states of Gujarat, Madhya Pradesh and Rajasthan. The emphasis in the first phase of the project was on -Development of farming systems -Focus on the introduction of new crop varieties, -Improved breeds of livestock -Micro irrigation, -Tree planting -Joint Forest Management (JFM) and soil & water conservation. Second phase has evolved a more holistic and sustainable approach to livelihoods support beyond natural resource based livelihood activities and incorporates migration support programme as well. This aims to reduce the risk of exploitation of migrant farmers and seasonal migration is treated as a positive force for local development. | Commitment of GBP 24.88 Million for Second phase (DFID) | To sustainably enhance the livelihoods of 675,000 poor rural people in areas of Western India, and to widely disseminate approaches developed in the project |
| Milli Watershed Development Programme in Madhya Pradesh (BAIF) | Watershed development on 34,510 ha in Jhabua, Rajgarh, Vidisha and Guna districts through 51 micro watersheds in 7 milli watersheds. | <u>Sponsored By</u> DRDA (Exact funding NA) | Increase in water-table, water availability for drinking, irrigation. |
| Comprehensive Watershed Development Project, Malwa Region, Madhya Pradesh (CWDP-MP)- Phase – II | Capacity building of farmers and other land users in priority villages in the identification, prioritisation and adoption of sustainable and more productive land use practices. Selected villages adopt improved cultivation practices on private land and take charge of the development and management of natural resources on common land. The Project creates an enabling environment farmers in the area. | GBP 1.119 Million (DANIDA) | Facilitate land-users to practice dry land agriculture, range management, horticulture and forestry on private and common land on a sustainable basis. |
| Rajiv Gandhi Watershed Mission | Panchayat-level funds for construction of village tanks and rejuvenation of tanks and wells. Water harvesting in rural areas. Urban water harvesting (on experimental basis) | GBP 99.03 Million (Jan 2001 to June 2002) | Augment, conserve and optimize the utilization of soil and water resources in rain fed areas. Focus on disadvantaged communities through |

| | | | |
|--|---|--|---|
| | | | <p>equitable distribution of resources and sharing of benefits.</p> <p>Maximize people's participation in planning, implementation and maintenance of soil and water conservation activities in watershed area.</p> |
| Bhoj Wetland Project | <ul style="list-style-type: none"> • Desilting and Dredging Works. • Catchment Area Treatment. • Sewerage Pollution Prevention Schemes & Construction of Garland Drain. • Shoreline and Fringe Areas Management. • Water Quality Monitoring. | <p>GBP 30.937 Million</p> <p>(JBIC)</p> | <p>To conserve and manage the Bhoj Wetland that consists of Upper & Lower lakes of Bhopal which are now being subject to severe environmental degradation due to pollution.</p> <p>To ensure availability of water from the upper lake which is one of the major source of water supply to the city of Bhopal in an increased quantity and satisfactory quality.</p> |
| Himachal Pradesh Forest Sector Reforms Project | <p>Developing a multi-stakeholder forest sector policy and strategy for Himachal Pradesh</p> <p>Developing a cost effective model for empowering and supporting the poorest forest-dependent women and men to strengthen their own livelihoods</p> | <p>GBP 7.5 million</p> <p>(DFID)</p> | <p>Rural livelihood strategy through sustainable forest management with increased emphasis on poverty eradication. A cost effective model for empowering the poor forest-dependent women and men and strengthening government and non-government institutions, to enable them to provide forestry-based livelihood support mechanisms and increased employment opportunities.</p> |
| Intergrated Watershed Development Programme (IWDP) – II, III, IV | <p>Training Community Organisation Watershed Treatment & Development Works</p> | <p>GBP 2.5 million</p> <p>(DRDA, Hamirpur, HP)</p> | <p>To achieve sustainable development of natural resources like soil, water and vegetation.</p> |
| Indo-German Changar Development Project | <p>Village Institution Development, Natural Resource Development Programs, Development of Technical Support and local Expertise at Village level</p> | <p>Approx GBP 4.7 m. (GTZ) and GBP 3.25 m. (HP Govt) (1994-2006)</p> | <p>The aim of reducing ecological degradation in the Changar area</p> |
| Total Funds | | <p>GBP 331.396 million</p> | |

**Appendix 4 Key project milestones
(all activities to be completed by June 2006)**

| MILESTONES | 2004/5 | 2005/6 | 2006/7 |
|--|--------------|------------------------------|-----------------|
| Programme start | Oct 04 | | |
| | | | |
| 1 Facilitation in HP (sites 1 & 2) | | | |
| Partner contracts signed in both states | Dec 04 | | |
| Team recruitment completed | Jan 05 | | |
| Facilitation at site 1(Kuhan) & 2 (Bhodi-Suan) in HP | Start Dec 04 | | End Jun 06 |
| Site 1 (Kuhan) & site 2 (Bhodi-Suan) Exposure visits | | Apr-Jun 05 | |
| Mechanism design and negotiation underway at site 1 & 2 | | Start Apr 05 | Complete May 06 |
| | | | |
| 1a Facilitation in MP (sites 3) | | | |
| Villages in catchment identified | Jan 05 | | |
| Facilitation at site 3(Bhoj), in MP | Start Jan 05 | | End May 06 |
| Exposure visits organized | | Apr -Aug 05 | |
| Mechanism design and negotiation underway in Bhoj | | Start Apr 05 | Complete Jun 06 |
| Interim and final report on process of facilitation at all sites | | Aug 05 | April 06 |
| | | | |
| 2. Supporting Research & Monitoring | | | |
| Wellbeing study - baseline - all sites | Start Jan 05 | End Jun 05 | |
| Land use & management practices - baseline - all sites | Start Jan 05 | End Jun 05 | |
| Watershed services (silt, flow, nutrients) | Start Jan 05 | Continue | End Jun 06 |
| Wellbeing study - impact - all sites | | Start Jan 06 | End May 06 |
| Land use & management practices - impact - all sites | | Start Jan 06 | End May 06 |
| | | | |
| 3. Strategic studies | | | |
| Hydro payments study | | Start Apr 05 - End Feb 06 | |
| Other study/s identified, commissioned, and completed | | Start Apr 05 | End Apr 06 |
| | | | |
| 4. Learning activities | | | |
| National learning group meetings (3) | Jan - Mar 05 | Oct -Dec 05 | Apr -Jun 06 |
| State level working group meetings HP (3) | Oct 04 | Jul -Sept 05 | Apr-Jun 06 |
| State level working group meetings MP (3) | Jan - Mar 05 | Oct - Dec 05 | Apr - Jun 06 |
| Final workshop | | | Jun 06 |
| 5. Documentation and Dissemination | | | |
| Websites active, from | Jan 05 | | |
| Policy briefs and working papers, from | | Jan 06 | |
| Presentations in sectoral forums (as required) | | | |
| Draft synthesis report | | | May 06 |
| Final synthesis report | | | Jun 06 |
| Inputs to email newsletter (periodically) | | | |
| Programme management | | | |
| WII & partner management & monitoring in place | Jan 05 | | |
| Quarterly reporting to IIED | quarterly | quarterly | quarterly |

Appendix 5 Initial Learning Group membership [note that membership is likely to increase as project progresses]

National level learning group

The first meeting of the national level learning group was held in New Delhi in July 2004.

| Name | Institution | Comment |
|---------------------------|---|--|
| Virender Sharma | DFID India | Environment & Livelihood Advisor |
| S Shivakumar | Ministry of Environment & Forests | Coordinates EPA clearances for dams etc, approves CAT plans |
| S K Joshi | Ministry of Environment & Forests | Coordinates international projects and cross-sectoral issues |
| Rajan Kotru | IGCEDP | Community based watershed planning. |
| N C Saxena | Rtd. Secretary Planning, & Rural Development | Governance and livelihoods specialist |
| Madhu Verma | Indian Institute of Forest Management, Bhopal | Environmental Economist |
| Dr Sachdeva | Planning Commission | National planner |
| Dr AK Gosain or associate | Indian Institute of Technology, New Delhi | Hydrologist |
| DN Pandey | Forest Dept and CIFOR consultant | Forestry and Livelihoods researcher |
| Deepinder Kapur | WaterAid | Supports NGOs and Municipal Corporations for water supply |
| A J James | Consultant | Economics and institutional issues consultant |

Himachal Pradesh learning group

The first meeting of the Himachal Pradesh learning group was held in October 2004. List of invitees:

| <i>Name</i> | <i>Institution</i> |
|----------------------|---|
| Yogesh Khanna | Secretary, Finance, Govt. of Himachal Pradesh |
| SS Negi, | Member Secretary, HP State Electricity Board (HPSEB) |
| Sanjeeva Pandey | Director – Great Himalayan National Park (GHNP) |
| RK Sood, Member Secy | HP Council for Science & Technology |
| Rajan Kotru | GTZ-Changar project |
| R.A Singh | PCCF, Forest Dept., HP |
| R K Gupta | Director, Kandi Project |
| Kishore Shah | HP Forest Sector Reform Project. |
| J.N Sharma | Engineer-in-Chief, Dept of Irrigation and Public Health IPH |
| Harinder Hira | Principal Secretary, Irrigation & Public Health Dept (IPH) |
| Deepak Sanan | Secretary Rural Development and Panchayati Raj |
| D.K Sharma | Secretary, Planning |
| Ashok Thakur | Secretary, Forests, Govt. of Himachal Pradesh |

Madhya Pradesh learning group

The first meeting of the Madhya Pradesh learning group was held in May 2004

| Name | Contact Info |
|---------------|--|
| Suresh Mishra | Jal Biradri |
| RRS Chauhan | IFS (retd). Kaliyasot Environment Protection Group |

| | |
|---------------------|--|
| Ram Prasad | VC, Bhopal University and Ex-PCCF, Madhya Pradesh |
| PS Dubey | Chairperson, SPCB, Bhopal (MP) |
| Mr Bhatt | Manager (Environment), Narmada Hydroelectric Development Corp. |
| MN Buch | Chairperson, NCHSE |
| Madhu Verma | Faculty, Indian Institute of Forest Management (IIFM), |
| LP Patel | Director, Agriculture, Govt. Of MP. |
| KT Chako | Principal Secy. Deptt of Rural Development, Govt. of MP |
| JS Mathur | Executive Director, Environment Planning and Coordination Organization (EPCO) |
| Jitendra Agrawal | Secy. Rural Development & Coordinator, MP Rural Livelihoods Project (DFID supported) |
| Gulshan Bamra | Commissioner, Bhopal Municipal Council (BMC) |
| Dwivedi | CE, Public Health Engg. Department, Government of MP, |
| DK Bandopadhyay | Director, Indian Institute of Forest Management (IIFM), |
| CV Deshpandey | Jt. Dev. Commissioner, RGWSM, Govt. of MP, |
| BMS Rathore | Secretary. Biodiversity Board, MP |
| AP Dwivedi | PCCF, MP, Satpura Bhawan, Bhopal (MP). |
| Aniruddhe Mukherjee | CEO, Lake Conservation Authority (LCA), Bhopal. |

Appendix 9 Logical Framework for India

Project Title: Developing incentive based mechanisms for watershed protection services and improved livelihoods. Implementation phase of the India country study under the international project: “Developing markets for watershed protection services and improved livelihoods”

Duration: October 2004 to June 2006

| Narrative summary | Objectively verifiable indicators | Means of verification | Assumptions |
|--|---|--|--|
| <p>Goal: To maintain and enhance the flow of direct and indirect services provided by watersheds, with particular emphasis on the livelihoods of the poor.</p> | <p>Watershed services and related local livelihoods improve where incentive based mechanisms are implemented</p> | <p>Documented assessments of changes in watershed services and related livelihoods following facilitation of incentive based mechanisms in watersheds</p> | <p>Continued widespread interest in finding innovative mechanisms for promoting watershed services & improved livelihoods</p> |
| <p>Purpose: To increase understanding and create capacity in national and local institutions to assess the potential of incentive based mechanisms to enhance watershed protection services and improve livelihoods, and to facilitate the design and use of such mechanisms when appropriate</p> | <p>1. Lessons from action learning are incorporated in plans of government, civil and private organizations. 2. Policies related to watershed protection reflect the concept of incentives for watershed services and improved livelihoods. 3. Approaches for assessing and facilitating incentive based mechanisms in watershed services are widely circulated and adopted</p> | <p>Review and monitoring of new policy and programme initiatives related to economic approaches to watershed protection services. Record of unique and repeat hits on project website and request for documents</p> | <p>Policy environment remains favourable for testing market and incentive based approaches for watershed protection Mandates and roles of key partners do not alter substantially during the course of the project. Policy makers and implementers are responsive to recommendations and implement findings.</p> |
| <p>Site-level facilitation Action-learning processes to design and test equitable market mechanisms for watershed services are developed at four sites</p> | <p>Transaction between upstream-downstream stakeholders to maintain the watershed services that support local livelihoods upstream is developed.</p> | <p>Existence of transaction; maintained or improved watershed services; equitable outcomes to upstream livelihoods</p> | <p>Common understanding develops of the linkage, between the watershed service and the upstream catchment management, at all sites</p> |
| <p>Supporting research Participatory research on changes in land use and resource management practices, watershed services and livelihoods at site and broader levels facilitates transactions, impact assessment and feeds into the national & state learning groups.</p> | <p>Improved understanding of the landuse, watershed service and livelihood linkages at all sites</p> | <p>Research reports are shared widely via site meetings and other media</p> | <p>None</p> |

| | | | |
|--|---|--|---|
| <p>Other Studies Studies on specific sectors (e.g. regulation based payments for hydro dam projects) and institutional mechanisms provide broader evidence of the relevance of incentive based mechanisms at state and national level.</p> | <p>Improved understanding of the potential for incentive based mechanisms among policy and sectoral audiences</p> | <p>Research reports are widely shared</p> | <p>None</p> |
| <p>National learning group Learning on incentive based mechanisms is shared with the national level learning group which feeds back to a broader audience</p> | <p>Lessons learned and experiences gained from sites are incorporated into state & national legislation, policy, and practice</p> | <p>Incorporation in policy and legislation and practices by government</p> | <p>National and state policy climate remains favourable to incentive based mechanisms for watershed protection. Project results in the identification of transferable lessons and methods</p> |
| <p>Documentation & Dissemination Project experience, project progress, and lessons learnt from the project are documented and made available to the national network, and sectoral audiences and others via multiple channels, for local, regional, national and international learning</p> | <p>Information is readily available at national and international levels</p> | <p>Specific sectors and audience oriented products are produced and available</p> <p>Record of meetings and conferences at local, state and national levels.</p> | <p>None</p> |