

# Watershed Management Challenges

## Improving Productivity, Resources and Livelihoods

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# Forest-Watershed-Irrigation Linkages: Policy Support for Integrated Management

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## Abstract

This paper assesses community based natural resource management (CBNRM) experience in the hills of Nepal through a review of literature and case studies. The aim is to identify methodological tools for the development of appropriate CBNRM institutional mechanisms for the upper watersheds of the Indus-Ganges Basin (IGB) in Nepal and India. Functioning institutional arrangements are expected to contribute to enhanced sustainable livelihood opportunities and reduce the vulnerability of poor rural people in IGB upper watersheds. Improved understanding of the internal and external linkages among multiple communities within watersheds and larger sub-basins is critical to strengthen management practices, particularly of forests and irrigation, by the communities. The analysis of the existing linkages or limitations in co-management of forests and irrigation are important in identifying policy constraints. Action research based on the policy assessment is designed to improve the integration of interventions by government implementing agencies with community-based initiatives. Policy support in turn is intended to increase poor women's and men's food security and improved livelihoods based on community-managed water and forest resources in a watershed or sub-basin context.

## Introduction

Because of the increasing pressure on the world's freshwater resources, growing water scarcity problems (both quantity as well as quality), and intersectoral competition for water, the Integrated Water Resources Management (IWRM) approach is being widely discussed and promoted. The Global Water Partnership (GWP) defines IWRM as 'a process which promotes the coordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems (GWP-TAC, 2000 Background Paper No.4). It is realised by all that instead of fragmentation and conflict, competing sectoral interests and responsibilities for the whole water sector can be resolved within a single integrated framework (GWP, 2000). IWRM, therefore, stresses the

internalization of water-related externalities (e.g., downstream scarcity caused by over-extraction of water upstream), the equitable allocation and distribution of water to multiple stakeholders, and appropriate balance between water as a basic need vs. water as an economic good. However, the 'integration' task in reality is not so simple. The actual implementation of such integrated frameworks at the national, regional, and local community levels are still in evolution.

Despite increased emphasis in international meetings and policy forums on the need for basin-level planning and application of IWRM, few functioning examples are presented in the literature that provide useful information on how integration is achieved. For the purposes of this paper, forests and irrigation have historically been managed by distinct administrative entities operating within different spatial boundaries, whereas forest and water resource dynamics follow ecological and hydrological boundaries. Because the watershed is a commonly understood spatial unit in hill and mountain environments, communities are increasingly managing forest and water resources along watershed lines. However, the linkage with external institutions, particularly government implementation agencies, demands an understanding of the complexity of merging watershed and administrative boundaries. As a result, operationalizing a viable decision framework at the local level based on IWRM principles has yet to emerge in IGB upper watersheds in Nepal and India.

Poor rural women and men face critical food security and livelihoods challenges, particularly in marginal upper watersheds of the Nepal and Indian Himalayas. Restricted access to often-degraded water, land, and forest resources combined with low productivity of open-access resources invariably result in seasonal or permanent out-migration and the loss of traditional knowledge, labour for management and community solidarity to address resource degradation. The result is insecure livelihoods and vulnerability to a range of environmental and other hazards. There are a number of successful examples of CBNRM innovations—often led by poor women who directly face the brunt of resource degradation and migration—that have led to significant improvements in food security and livelihood sustainability, and have stemmed migration (Pant *et al.*, 2003) due to increased employment in agriculture through increased availability of irrigation water and utilization of forest products. The Community Forestry Policy in Nepal and Joint Forest Management Program in India are examples of successful replication of CBNRM over large areas. The communities need to manage multiple resources, particularly forests and water, and also have to address resource competition issues with other communities, e.g., upstream diversions of water that affect downstream availability. Successful examples of multiple resource management by communities are less common, and generally confined to single sectoral approaches such as the community forestry program and farmer-managed irrigation systems (FMIS) in Nepal and some of the watershed programs in Nepal, e.g., Churia Forestry Development Programme of GTZ (Pant and Kharel, 2000), and India. Farmer-managed irrigation systems can be viewed as an instance of local communities establishing successful institutions for collective benefits (Pradhan and Bandaragoda, 1997; Pant, 2000).

It is hypothesized that the integration of activities of forest users groups (FUGs) and water users groups (WUGs) at the watershed level would improve the management of natural resources and have beneficial impacts on the livelihoods of both resources. This would also facilitate a wider development process at the community level to support rural livelihoods and improved community development options. In addition, it is believed that integration would also help to empower local communities in a broader context of decentralization while providing an improved incentive structure for collective action. The discussion is based on a case study in two hill watersheds in Tanahu and Kaski districts in western Nepal. This paper addresses some of these issues and assesses opportunities for integration of irrigation and forest resources by outlining a methodological approach for a new project under implementation by the International Water Management Institute (IWMI) and civil society partners, under support from the CGIAR Challenge Program on Water and Food.

## **Present Context and Problems of Community Based Integrated Natural Resource Management**

Forests and water for irrigation are two central resources for livelihood enhancement, especially of the poor. Local initiatives for their management are diverse and complex in Nepal and the Indian Himalayas. An important consideration in this respect is that although the rural poor continue to heavily depend on these resources, they have not been subjected to the degree of over-exploitation seen in other parts of south Asia, largely because management is localized and guaranteed by legislative provisions. At the same time, the utilization and management of forests and irrigation by communities have led to the evolution of institutional arrangements that lie at the centre of sustainable resource use.

### *Institutional Linkages*

In recent decades, various agencies including governments in the IGB upper watersheds have invested tremendous effort and resources to build local organizations, seeking to institutionalize FUGs, WUGs and other community based organizations (CBOs). The major shortcoming of these resource-specific institutions, however, has been their ineffectiveness in resolving inter-sectoral conflicts. As a result, these institutions have not been able to address the problems of resource management at a watershed level due to the increasing complexities of managing multiple natural resources. For example, each year landslides triggered by haphazard road construction activities wreak untold damage to forests, agricultural land, irrigation infrastructure, and human settlements in the hills of Nepal and India. Effective watershed-level management would help in reducing such calamities. With increasing focus on integrated natural resource management there is a need for watershed level institutions to facilitate integrated approaches to the management of natural resources. The development of watershed level institution is expected to overcome problems associated with the land, forest and water management by

integrating the activities of various local level institutions like WUG, FUG, local elected institutions and other interest groups while at the same time providing crucial institutional external linkages, e.g., in the case of road construction.

At micro-watershed level, there are instances of local communities who have initiated efforts at integrated resource management through the use of water for various economic activities and watershed management along with income generation activities (Pant and Bhattarai, 2001; Pant and Kharel, 2000). These successful experiences at village level provide a basis for integration of natural resources at the watershed level and help in building appropriate institutional mechanisms. It would, therefore, be more appropriate to conceptualize integration towards institutional collaboration through implementation of complementary activities at the watershed level. Ultimately, this would contribute to the evolution of higher-level institutions for watershed or river basin management, and could also be an effective planning unit for IWRM including natural resources (GWP-TAC, 2000 Background Paper No.4). The emergence of an institutional mechanism at the watershed level could be helpful in tackling the cyclical nexus between poverty and natural resources management, thereby benefitting the poor (World Bank, 2002). Underlining this, common property resources (CPRs) are a crucial element of poor people's coping and adaptive strategies. Because institutions can play an important role in redistributing resources in favour of the poor, poor people's access to the natural resources on which they depend could be mediated by institutional arrangements that create an enabling environment for the poor.

Many local level water management groups in Nepal and India have received institutional recognition by the government, while some are without formal recognition, which has restricted their access to external resources. Similarly, the management of forests by local communities in the hills of Nepal and watershed samithis (committees) and joint forest management committees in India can be cited as examples of sustainable resource management. This offers an opportunity to understand the relationships between FUGs and WUGs at the watershed level where the twin resources are clearly linked. In order to create real livelihood opportunities without affecting other users' options, multiple communities must coordinate their actions.

A recent study by Pant *et al.* (2003) suggests that informal interactions between WUGs and FUGs do exist, however, this has not evolved towards an integrated approach to resource management to address the issues related to resource degradation, access and competition among multiple users. Active policy and institutional reforms are underway in Nepal and the Indian state of Uttaranchal, but institutional fragmentation remains a key barrier to integrated approaches on the ground. Uttaranchal recently created a Watershed Directorate to coordinate actions of government agencies for forest, water supply and irrigation management. Similarly, recent Nepalese government policies, particularly the Water Resources Strategy (WECS, 2002), have emphasized integrated resource management at the sub-basin and basin levels. However, lack of appropriate institutions at the local level has constrained the integration of activities. Linking upstream and downstream resource management activities at the sub-basin levels in order to integrate the

benefits and institutionalize win-win solutions for both forest and water-dependent women and men has not been systematically addressed either from the practical implementation or research perspectives. Gender and intra-community dynamics are critical to the internal functioning of institutional mechanisms for water and forest management. The role of local and national or state government policies and programs as well as civil society organizations and NGOs will increasingly influence local action at the household and village levels. One of the challenges in this respect is to facilitate the evolution of an institutional base for the linkages between various resource management groups.

### *Challenges and Opportunities*

In addition to protecting or conserving resources, many CBNRM institutions are fostered at the local level with broader goals of reducing or eradicating poverty by empowering the local community. They could provide the basis for integration and higher-level institutional linkages if mobilized in that direction. Conflicts over resource use and concerns over equitable distribution of resources among all users including poor men and women are the major challenges faced by CBNRM groups at present. Experiences from the field suggest that CBNRM groups and concerned stakeholders also foresee the usefulness of improved institutional linkages. In addition, facilitation of strong local-level institutional integration could more effectively advocate and influence policy-making and redress existing policy ambiguities regarding CBNRM. The case study (Pant *et. al.*, 2003) done in the hills of Nepal indicates that decentralized management of natural resources is a promising resource use and conservation approach but it has a long way to go to achieve the goal of poverty alleviation through CBNRM due to lack of appropriate institutional mechanisms to promote it at the local level. The field survey suggested that some of the communities have already felt that need, however, the integration of the natural resource management activities needs further exploration. This requires intensive interaction with communities to understand the dynamics of resource use, particularly if policy reform is to support the integration of irrigation and forest management at the local community and watershed levels.

The major areas for integration required are at the policy, legal and institutional levels. In both Nepal and Uttaranchal, there appear to be major policy gaps in promoting integration of development activities despite the rhetoric on integrated design and implementation of programs. Ambiguities at the policy level are manifested in legal provisions, which in turn are fundamental to the identification of rights, role and delineation of authority among various stakeholders. Fragmented planning and implementation of a range of developmental activities have encouraged the promotion of sectoral interest to the neglect of integrated development. The institutional roles of the planning and implementing partners at the grassroots level need to be coordinated. At the same time, the local elected officials should support coordinated water, forest and land management and seek to implement programs and apply financial resources in a coordinated manner. Likewise, regular consultation among various users through external facilitation could be an

appropriate step towards evolvement of higher-level institutions through users' initiatives for better integration. The capacity of the district level institutions and local elected officials needs to be strengthened, as they play a vital role in facilitating integration of activities at local level.

### **Proposed Action Research**

Keeping in view the need to identify appropriate institutional mechanisms for resource integration and external linkages to support CBNRM, an action research project titled 'Linking Community-Based Water and Forest Management for Sustainable Livelihoods of the Poor in Fragile Upper Catchments of the Indus-Ganges Basin' (to be jointly implemented by IWMI, the Stockholm Environment Institute – York, the Institute for Water and Human Resources Development, and People's Science Institute under financial support from the CGIAR Challenge Program on Water and Food; see [www.waterforfood.org](http://www.waterforfood.org)) is being initiated in the hills of Nepal and Uttaranchal. The goal is to contribute to enhanced sustainable livelihood opportunities and reduced vulnerability for poor rural people in upper watersheds of the Indus-Ganges basin in Nepal and India. This will be achieved through improved understanding of existing linkages or limitations to couple forest and water management leading to policy support to the respective governments on appropriate institutional frameworks and to program support for implementing agencies.

#### *Research Questions*

Using an action research approach the following questions will be addressed:

- What are the policy and legal measures and their associated institutional structures that permit integrated forest and water resource management in Nepal and Uttaranchal state in India?
- What are the constraining and facilitating factors to promote opportunities to strengthen livelihoods based on forest and water resources by improving their productivity in two Himalayan sub-basins?
- How can integrated water resources management and watershed level planning be facilitated through expanded mandates for local CBNRM institutions by strengthening users' roles and linkages with external resources?
- What are the mechanisms to scale up integrated water and forest management at the sub-basin level?

#### *Activities*

Following from the questions listed above, a series of research activities are being initiated.

#### *Analysis of legal, policy and institutional frameworks*

- a) Review of policy, legal and institutional provisions for the management of natural resources in order to understand how they are applied or modified in

practice. Attention will be paid to the implications of governmental programs on local people's livelihood.

- b) The implications of existing policies for the scope and performance of various institutions at the local level will be analyzed to assess their effectiveness in propagating local-level resource management, both for forest and water separately and for integrated management.
- c) Initiation of dialogue at the policy level through separately and combined (Nepal and Uttaranchal) workshops that will bring together 25-30 participants in order to design a detailed analytical and methodological framework. It will also serve to inform stakeholders to ensure their participation in the study.
- d) Review of literature and field studies based on the methodology defined will be undertaken to examine past experiences with integrated resource management in order to understand successes or failures and their causes.

#### *Promote livelihoods through enhanced forest and water productivity*

A rapid resource and livelihoods assessment will be conducted in parts to create baseline information for time series analyses of these issues in future. The outcome will be a set of context-specific data collection tools geared to individual examples of linked forest and water management. The water and forest resource use and demand priorities of different stakeholders in at least three communities—upper, middle and lower reach—in each sub-basin will be assessed using user-defined cumulative checklists and participatory research methods. The types of resource scarcity and stress users have observed over a period of time and their coping strategy will be assessed.

#### *Examination of expanded mandates for local users groups*

- a) Assessment of different approaches, experiences and management options for water, land and forest management in Nepal and Uttaranchal through expert consultation with experienced civil society, local government and resource management agencies will be done. Identification of *models of good practice* for management of these resources and their replicability will be explored through role-play exercises with resource users.
- b) Assessment of existing challenges and opportunities in the use of resources by identifying groups having access and control, groups deriving benefits, and groups excluded from access to natural resources and the management decision-making process.
- c) Analysis of the effectiveness of local resource management institutions and the potential for expanding their mandates to include integrated resource management. This will be done through the analysis of existing management practices, constraints and opportunities.
- d) Development of an action plan for improving community-based resource management through interviews, surveys and role-plays activities.

### *Scaling up mechanisms for IWRM*

- a) This activity will focus on the implementation of the action plan prepared as per foregoing activity for improving community-based resource management. A common water-forest management federation (*Pani-Ban* in Nepali or *Jal-Jangal Samiti* in Hindi) consisting of about 25 resource users and up to 5 local government representatives will be initiated at the sub-basin. Members of existing water users group, forest users group, watershed management groups, local government, NGOs, and advocacy groups will be the members. Federation members will meet once a month during the first year, and quarterly thereafter to identify and solve problems. External experts may serve as resource persons. The objective of the federation is to link forest and water resource users and provides a bridge to external resources.
- b) Organizing a workshop to facilitate interaction between policy makers and other stakeholders to come up with viable solution to address problems identified during the study period.

### *Methodology*

The methodology for this study is outlined below.

#### *Activity 1*

- Desk top study of the government policies and legal provisions on water, environment, forest and social organization. Review of land, water, forest, cooperative, environment act and laws, local development act and association registration act.
- Focus group discussion, key informants, ethnohistories, direct observation, PRA with local users, local officials to gather information on resource management practices, influence of policy on local resource management with focus on identifying constraining and facilitating factors for CBNRM.
- Workshop to inform policy level stakeholders (25-30 persons) to get their suggestions on the proposed study.
- Collection and documentation of the experiences from the program implemented in the past and present.

#### *Activity 2*

- Initiation of dialogue and interaction with local stakeholders in selected sites on the approach for action research in the field. Assessment of resource base and social mapping of the study area using PRA tools and other measurement techniques.
- Assessment of change pattern in resource base (through interviews, key informants, direct observation, oral histories) with stakeholders with focus on gender analysis of resource tenure, and use and conservation knowledge and skills, gender access to resource and its implications, gender role in time of stress and coping strategy. Gender analysis of resource tenure and use and conservation knowledge and skills, gendered access to resource

and its implications, determination of gender role with an emphasis on gendered resource access and the critical need to address feminization of resource management due to male out-migration. GIS information and an assessment of sub-basin hydrology based on reported data and water balance simulation methods (simple, landuse dependent rainfall-run-off approaches in the SWAT modeling framework).

- Assessment of resource needs and demands of households in one community each in upper, middle and lower reach of watershed through semi-structured interview. The community thus selected will be heterogeneous to reflect the need of various stakeholders.

### *Activity 3*

- Identification of approaches in the implementation of CBNRM applied by various institutions, organizations and civil society in consultation with development practitioners from these organizations. Organization of one expert consultation meeting to identify management options for CBNRM. The management options will be discussed with the users to adapt to the local conditions. Exchange visit of local users between Uttaranchal and Nepal will be organized.
- Categorisation of groups having better, less and no access and control of resources and structured and semi-structured interview, focus group discussion with them to know reason for the situation and how access and control to resources could be increased. The data will be disaggregated to identify gender role in access to and control of resources and its implications in resource management.
- Structured questionnaire surveys on food security strategies at the household and village level focussing particularly on water management in both rainfed farming and small irrigation schemes, and wealth ranking and livelihood and policy analyses.
- Administration of checklists to the officials of local institutions (elected, I/ NGOs, CBOs) and other stakeholders involved in development activities at local level. Dialogue and interaction among representative of these institutions will be organized to expand their mandate.
- Interviews, surveys and role-plays activities for action plan development for improving community-based resource management.

### *Activity 4*

- Identification of representative (25-30) of resource user groups through discussion with various resource users group.
- Facilitate development of working modalities of the committee in consultation with the committee members and help develop action plan for institutional linkage, coordination, NRM management strategy to improve inter-community benefits and reduce conflict.
- Organisation of workshop for policy level stakeholders.
- Synthesis of research activities.

## Expected Outputs

The following output will be generated through this study:

- Report on comparative analysis of the policies and legal provisions relating to management of land, water, forest and association registration act.
- Documentation of discussion points and reports on the resource management dynamics as expressed by the users at the local level and workshop report detailing the discussions and suggestions of policy level stakeholders.
- Report on the review of experience in the implementation of integrated natural resource management in the past.
- Documentation of the availability of resource and livelihood dependence on these based on the experience of local stakeholders along with covering resource endowment, socio-economic and institutional information/database in each of the 5 sites through measurement and comparative analysis of database.
- Establishment of disaggregated database for household resource needs, demands, sources, gaps in resource demand and availability, and alternative means applied to fulfil gap. Differentiation of need of various resource users with focus on gender role is emphasized.
- Documentation of the approaches and experiences of related agencies and development of alternative approach for implementation in the field.
- Disaggregated database and analysis of the households, and groups with gender focus on their relative access and control of resources along with analysis of information and preparation of report on food security and livelihood strategies of household in the study area.
- Documentation of experience and identification of options for dialogue among policy level stakeholders for their feedback and preparation of action plan.
- Formation of *Pani-Ban* or *Jal-Jangal Samiti* in Nepal and Uttaranchal, India respectively for implementation of action plan and documentation of the methodologies applied by the community.
- Preparation of workshop proceedings, research reports, working papers and journal articles.

## Conclusions

The brief review provided here has analyzed the existing gaps, at both the policy and implementation levels, and provided insights into the issues that need further investigation for the operationalization of CBNRM to co-management of irrigation and forest in the IGB upper watersheds in Nepal and Uttaranchal, India. Involvement of primary stakeholders in the identification of the constraints and opportunities through dialogue and interaction among representative of these institutions is expected to facilitate integration of the twin resources as well as to expand the communities' mandate for resource management at the local level.

This will be beneficial for the development of an institutional base at the local level through action plans for external institutional linkages, coordination, NRM management strategy to improve inter-community benefits, and to reduce conflict. The recommendations from the action research are expected to contribute to policy reforms that promote scaling up community-based approaches for Integrated Water Resource Management.

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