

# **Linking Community-Based Water and Forest Management for Sustainable Livelihoods of the Poor in Fragile Upper Catchments of the Indus-Ganges Basin**

## **Brief Title: Resource Management for Sustainable Livelihoods**

### **Executive summary**

The goal of this study is to contribute to enhanced sustainable livelihood opportunities and reduced vulnerability for poor rural people in upper catchments 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.

This project intends to directly support the opportunities for poor women's and men's food security and improved livelihoods based on community-managed water and forest resources focusing on rainfed agriculture, harvesting of common property resources, small-scale irrigation systems, spring-fed drinking water supply, community forestry, and watershed management in one sub-basin (50-100 km<sup>2</sup>) covering 5 communities each in the Nepal and Uttaranchal. Internal and external linkages among multiple communities within the sub-basin will be addressed.

The specific objectives of the study are as follows:

1. Identify innovative policy and legal measures and their associated institutional structures that permit integrated forest and water resource management in Nepal and Uttaranchal state in India.
2. Promote opportunities to strengthen livelihoods based on forest and water resources in two Himalayan sub-basins through assessment of present use and analysis of constraining and facilitating factors for enhancing water and forest productivity.
3. Examine expanded mandates for local CBINRM institutions by strengthening users' roles and linkages with external resources leading to integrated water resources management and sub-basin level planning.
4. Assess and determine mechanisms to scale up integrated water and forest management at the catchment level.

### **Institutions participating**

1. International Water Management Institute  
Department of Irrigation Building, Room # 413  
Jawalakhel, Lalitpur  
GPO8975 EPC 416, Kathmandu, Nepal  
[d.pant@cgiar.org](mailto:d.pant@cgiar.org)  
CGIAR

2. Stockholm Environment Institute  
University of York  
York YO10 5YW, United Kingdom  
ac29@york.ac.uk  
ARI \* **Note: The correct classification is NGO**

3. Peoples' Science Institute  
252, Vasant Vihar, Phase 1  
Deharadun 248006, Uttaranchal, India  
[psiddon@sancharnet.in](mailto:psiddon@sancharnet.in)  
NGO

4. Department Of Irrigation  
Jawalakhel, Lalitpur, Nepal  
[doi@info.com.np](mailto:doi@info.com.np)  
NARES

5. Institute of Water and Human Resource Development  
NGO  
P.O.Box 8975 EPC 1115, Kathmandu, Nepal  
Email: indra\_kalu@hotmail.com

### **Project Leader and Research Coordinator**

Dr. Dhruba Pant  
Sociologist  
IWMI

### **Principal Investigators**

Dr. Christopher Scott  
Hydrologist  
IWMI  
Principal Researcher and South Asia Regional Office Director

Dr. David Molden  
Water Resources  
IWMI  
Leader, Comprehensive Assessment

Dr. John Soussan  
Environmental Economist and Policy analyst  
Stockholm Environment Institute  
Professor

Ms. Sabita Thapa  
Gender Expert

Stockholm Environment Institute  
Research Assistant

Dr. Ravi Chopra  
Environmentalist  
Peoples Science Institute  
Director

Dr Binod Bhatta  
Forestry expert  
Institute of Water and Human Resource Development  
Researcher

Dr. Khem Raj Sharma  
Engineer  
Department of Irrigation  
Senior Divisional Engineer

Dr. Dhruba Pant  
Sociologist  
IWMI  
Research Coordinator

**Budget requested from CP**

US\$ 359,371

**Budget offered as matching fund**

US\$ 158,200

**Total Budget**

US\$ 517,571

**Duration of the project**

3 Years

**Coverage of the basin**

Indo-Gangetic basin

**Coverage of themes**

**Crop Water Productivity (Theme 1) 20%**  
**Multiple Use of Upper catchment (Theme 2) 50%**  
**Aquatic Ecosystems and Fisheries (Theme 3) –**  
**Integrated Basin Water Management Systems (Theme 4) 20%**  
**Global and National Food Water Systems (Theme 5) 10%**

### **Background and justification**

Poor rural women and men face critical food security and livelihoods challenges, particularly in marginal upper catchments 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, labor 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 innovations in community-based natural resource management (CBNRM)—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 livelihoods sustainability, and have stemmed migration (Pant *et al*, 2003) due to increased employment in agriculture through increased availability of irrigation water and through utilisation 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. Functioning models of CBNRM seem to work for a single critical resource, e.g., forest. Examples of more integrated approaches tend to be found only at a small scale, in one or just a few communities. Yet 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 are 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 India.

Forests and water constitute two major resources wherein people's initiatives in management have made important strides towards livelihood enhancement. This has contributed to the evolution of institutions that are central to resource conservation and utilization. Water users groups (WUG) that have traditionally utilised and managed water resources at the local level are considered to be important institutions for water management. 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).

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 can be cited as a sustainable example of resource management. Forest users groups (FUGs) have evolved significantly over the last two

decades (Soussan *et al*, 1995; Soussan, 1998) as strong and formal local institutions that address not only the protection of forests but also various developmental activities in villages (Springate-Baginski *et al*, 2000). The same is true of watershed *samithis* (committees) and joint forest management committees in India. From an early emphasis on physical soil and water conservation and forest plantation activities, these committees are increasingly managing natural resources as well providing critical links between users and state agencies (Farrington *et al*, 1999; Joshi *et al*, 2003; and Chopra, 2003). Throughout the Himalayan hills there are now thousands of community resource management groups acting as effective, participatory, and democratic institutions. This offers an opportunity to understand the relationships between FUGs and WUGs at the catchment level where the twin resources are clearly linked in terms of management of scarce resources and in creating employment opportunities, but where multiple communities must coordinate 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, its availability and competition among multiple users. One of the challenges is the lack of an institutional base for the linkages between various resource management organizations. For example, forest and water users groups have only tenuous linkage with local government institutions. This has restricted their potential to address the multiple needs of the stakeholders. Furthermore, scaling up their scope so that multiple communities manage linked resources in an integrated way requires the introduction of a range of legal, policy, institutional, and local-level resource management innovations. 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.

The universal nature of and high priority given to water use at the community level makes this the obvious entry point from which to build integrated local level resource management whilst at the same time meeting immediate needs. This covers both rainfed agriculture and small irrigation schemes, but also critically spring-fed drinking water supply, all of which are central to livelihood security in the Nepal and Indian Himalayas. At the same time, watershed-based forestry programs have significant impacts on livelihoods of the poor, particularly women who face the daily challenge of meeting fuelwood and fodder needs. The spread of community forestry groups also means that this sector offers a locally-rooted institutional base. Yet intensification of forestry activities also has downstream hydrological impacts on water supplies.

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. Poor women in particular often face barriers or constraints in accessing water and forest resources and out-migration resulting from low productivity levels further diminishes the

knowledge and labor pool required to maintain productive resources. These constraints will be addressed through gender-neutral pro-poor research methodologies including research tasks led by local women involved in participant observation, drawing lessons from social movements led by women, e.g., the Chipko forest conservation and social development process in Uttaranchal, and solidarity groups and exposure visits with predominantly women participants.

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 have emphasised integrated resource management at the sub-basin and basin levels through the formulation of the Water Resources Strategy (WECS, 2002). However, lack of appropriate institutions at the local level has constrained the integration of activities. IWMI and WECS collaborated on a study to explore the evolution of the institutional base for integrated resource management although it is realized that institutional development is a long process (Pant and Bhattarai 2000). This is especially true where starting from scratch, so that a framework building on existing local institutions will allow the reform process to be more focused on specific needs and opportunities for poor women and men. In this context, the analysis and documentation of information obtained through participatory action research on institutional integration will provide a knowledge base and help develop strategies for the promotion of community based integrated natural resource management (CBINRM). This Challenge Program research will help government agencies in Nepal and Uttaranchal to develop and implement appropriate policy measures for linked forest and water management. A range of agencies (including NGOs like PSI and IWHRD) implementing programs for natural resource management through community participation will benefit through insights on the dynamics of integrated natural resource management. Likewise, forest and water users will benefit by consolidating their knowledge base, a process that will facilitate the development of institutions for CBINRM through participatory action research.

This study will significantly complement the proposed Challenge Program projects No. 88 “Hydrological evaluation of land and water management practices in upper catchments of IGB and its impact on productivity, livelihood systems and downstream reaches,” No. 91 “Improving water productivity, poverty reduction and sustainability in mountain farming systems in upper catchments of Indo-Gangetic Basin,” and No. 107 “Integrated river basin management in Nepal: impacts and future trends in development and management of the Indrawati and Bagmati basins.” This proposal’s clear-cut institutional focus does not overlap with, but directly supports the technical focus of the first two proposals on watershed hydrology (88) and farming systems (91). No. 107 is geared towards the specific issue of inter-basin transfers and planning of investment-heavy infrastructure and makes an excellent complement to this project.

## **Goal**

The goal of this study is to contribute to enhanced sustainable livelihood opportunities and reduced vulnerability for poor rural people in upper catchments 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.

This project intends to directly support the opportunities for poor women's and men's food security and improved livelihoods based on community-managed water and forest resources focusing on rainfed agriculture, harvesting of common property resources, small-scale irrigation systems, spring-fed drinking water supply, community forestry, and watershed management in one sub-basin (50-100 km<sup>2</sup> covering 5 – 10 communities) each in the Nepal and Uttaranchal. Internal and external linkages among multiple communities within the sub-basin will be addressed.

## **Specific objectives**

Forest or water sector management regimes have achieved a certain degree of success but are often thwarted by contesting claims and conflicts that are beyond resolution by any single institution. One among such problems of immediate concern is that livelihood dependence in rural watersheds is increasingly becoming vulnerable to the effects of land use changes that originate outside their locality. For example reduced dry season flow downstream in drinking water springs resulting from poor land management in spring recharge zones upstream including intensification of forest plantation without measures to enhance recharge. There is a lack of integrated institutional approaches to tackle such problems. Therefore, the overall objective of this study is to contribute to the livelihood enhancement of natural resource users by scaling up water and forest management practices in an integrated way based on the better understanding of existing community-based strategies. The specific objectives of the study are as follows:

1. Identify innovative policy and legal measures and their associated institutional structures that permit integrated forest and water resource management in Nepal and Uttaranchal state in India.
2. Promote opportunities to strengthen livelihoods based on forest and water resources in two Himalayan sub-basins through assessment of present use and analysis of constraining and facilitating factors for enhancing water and forest productivity.
3. Examine expanded mandates for local CBINRM institutions by strengthening users' roles and linkages with external resources leading to integrated water resources management and catchment level planning.
4. Assess and determine mechanisms to scale up integrated water and forest management at the sub-basin level.

## Activities and methodology

### Activities

The following will constitute the research activities based on the objectives mentioned above.

#### 1. Identify innovative legal, policy and institutional frameworks

- a) Review of policy, legal and institutional provisions for the management of natural resources specifically in order to understand how they are applied or modified in practice. Attention will be paid to the implications of governmental programs for local people's livelihood. This activity will be carried out through interviews with officials, resource users, and researchers and through critical review of existing policies and laws from the perspective of coupled forest and water management. PSI and IWHRD, supported by SEI and IWMI, will carry out this activity. One Post Graduate level student from the Nepal Law Campus, Tribhuvan University will be asked to review the legal provisions related to water, land and forest management to identify constraining and facilitating factors for CBINRM. Dr. M.S. Vani, a natural resources legal expert, will join PSI to conduct the legal review of the Indian Uttaranchal component of project.
- b) The implications of existing policies for the scope and performance of various institutions at the local level will be analysed to assess their effectiveness in propagating local-level resource management, both for forest and water separately and for integrated management. This activity will provide insights into shortcomings and obstacles to integrated resource management and will generate appropriate policy recommendations. This activity will be carried out through focus group discussions with members of resource users groups at the village level and interviews with representatives of local government institutions and government employees at District and village levels. PSI and IWHRD will carry out this work.
- c) Holding workshops to inform policy level stakeholders about the approach and methodology in order to get their inputs on the design of the study. Separate and combined (Nepal and Uttaranchal) workshops will bring together 25-30 participants in order to design a detailed analytical and methodological framework. It will also serve to inform stakeholders through the initiation of dialogue at the policy level and is expected to ensure their participation in the study. All project partners will participate in this important activity.
- 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. This activity will be carried out by PSI, IWHRD and IWMI.

#### 2. Promote livelihoods through enhanced forest and water productivity

- a) Informational meetings at the village level within each sub-basin to mobilize local stakeholders and users groups. A rapid resource and livelihoods assessment will be conducted, in part 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. PSI and IWHRD supported by SEI and IWMI will carry out the work.
- b) Kunjgad watershed in Uttaranchal in Mandakini Valley with an area of approx 50 sq km which is located about 10 km from Augustmuni, the block headquarters is selected for the study. It has 24 revenue villages. Its altitude ranges from about 800 m to 2800 m. This area has a mixed community with irrigation users and watershed management groups. PSI is involved in resource management activities through local groups in the area since 2002. Likewise, Begnas-Rupatal watershed area in Kaski District, Western Nepal has been selected for the study. It has an area of 173 sq.km covering 7 Village Development Committees. The watershed area varies between 60 m to 1120 m. It has a mixed community and users group for irrigation, drinking water, irrigation, forestry are functioning in the area.

In these study sites, the collection of experiences on water & land/forests resources through PRA tools and direct interview methods will provide insights into the experiences of users in accessing and managing these resources. The research can consequently undertake stakeholder-based assessments of key patterns of resource use and potentials and relate this to opportunities for enhanced, targeted food security and livelihoods development with an emphasis on gendered resource access and the critical need to address feminization of resource management due to male out-migration. The types of resource scarcity and stress users have observed over a period of time and their coping strategy will be assessed. The assessment will also focus on gender roles in accessing resources and its implications for women in time of resource stress. Stress mitigating strategies will be analysed to assess gender roles differentiations in resource management. The availability of resources in the area and changes in its availability over a period of time will be analysed to understand the sustainable use of these resources by comparing land use change data through the use of maps, GIS information and an assessment of sub-basin hydrology based on reported data and water balance simulation methods (simple, landuse dependent rainfall-runoff approaches in the SWAT modeling framework, see below). Users' recall of historical conditions has proven to be a robust first-cut impact assessment approach. DOI and IWMI will carry out these activities with input from PSI and IWHRD.

- c) 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 assessment will differentiate the needs of various resource users by gender, users roles in conservation, utilization of available resources, the existing interaction pattern among various stakeholders, and the gender differences in decision making and participation in community resource management. The disaggregation of data will constitute an important activity in

identifying users' roles from a gender perspective. PSI, IWHRD and SEI will carry out this work.

### 3. 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. Identification of *models of good practice* for management of these resources and their replicability will be explored through role-play exercises with resource users. SEI and IWMI will lead this activity with input from PSI and IWHRD.
- b) Documentation 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. This will be carried out through the administration of checklists and focus group discussions with the stakeholder groups mentioned. The data will be disaggregated to identify gender roles relative to access to and control of resources and their implications for resource management
- c) Specific information will be collected using two principal methods: i) structured questionnaire surveys on food security strategies at the household and village level focusing particularly on water management in both rainfed farming and small irrigation schemes, and ii) wealth ranking and livelihood and policy analyses.
- d) 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, analysis of constraints and opportunities through administration of checklists to the officials of these institutions and other stakeholders.
- e) Development of an action plan for improving community-based resource management through interviews surveys and role-plays activities.

All these activities will be carried out by SEI, PSI, IWHRD and IWMI.

### 4. 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 (\* 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, Women 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. The following are several of the expected activities of the federation:

- i. Establishment of institutional mechanisms for co-ordination between communities in the sub-basin and the development of a land, water, and, forest management strategy based on community action.
  - ii. Development of links between local communities and other institutions and government agencies that facilitate and support the community-based resource management.
  - iii. Development of a community-based actions planning process for improvements to water, land and forest that will also have inter-community benefits or at least minimize inter-community conflicts.
  - iv. Documentation of methodology applied in the research work.
- b) Organising 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.

PSI, IWHRD, DOI, SEI and IWMI will carry out the activities.

The research will be divided into two phases. Activities 1, 2 will be covered during the first year of the study period. Workshop in both the pilot areas will be held at the beginning of the study. This will create a base for the action research activities 3 and 4 and will be carried out in next one and half years. The last six months will be spent on organizing the information collected during PAR, consolidation of research report and preparation of future action plan.

The involvement of local stakeholders in information generation and use of their knowledge through interaction will form the core of the research activities with emphasis on strengthening their capability to carry out and contribute to the study outcome. The research will follow the participatory action research approach which is iterative, takes into account the diversity of the roles different actors play in the management of resources, is acutely aware of gender dimensions and adaptive to the local condition. The focus is at the community level but also entails interactions at different institutional levels including the national (or state) policy level.

In this research, the approach will build on past activities and links to on-going development projects, meaning that substantial amounts of data on the natural resource base, livelihood patterns, existing laws, policies and institutions and resource management practices in the research areas are already available or will be developed through the matching funds contributions. Collaboration with on-going action programs will consequently be beneficial for the action research and also for obtaining incremental

value from the use of available resources and possibility for this collaboration will be explored.

The analytical approach to link multiple communities' resource use practices in a sub-basin will be based on integrated hydrological modeling using the simplified Soil Water Assessment Tool (SWAT). SWAT is public-domain software with minimal data requirements that has been successfully applied in Himalayan catchments. Where available, existing remote sensing and GIS studies will be incorporated into the analysis.

Further, with the proposed collaborative arrangement, the respective government agencies will also jointly share ownership of the research. As the proposed research focuses on policy, the scaling up process will involve extending existing dialogues with policy makers, preparing documentation and holding workshops in both pilot areas and at the central level. Where opportunities exist, the scope for influencing the design and scope of future development projects will be explored. It is essential to detail how the project will function at community, sub-basin and macro (national) levels.

### ***Community Level***

The strategy will be to work with FUGs, WUGs and watershed management groups to explore their potential for developing into more comprehensive local-level resource management institutions. Detailed investigations of existing water and land management practices in these communities will be undertaken, to establish their effectiveness, constraints upon them and potentials for improvements. A specific topic included here will be the assessment (and if possible valuation) of changes to water resources that can be attributed to improvements to the watershed characteristics of community forest areas. The geography of many hill areas, with forests on ridge peaks and terraced farmlands on the lower slopes, will make the establishment of such direct links possible.

The membership, participation and operational effectiveness of the local resource management institutions with focus on representativeness in gender and social terms will be assessed by verifying the available documents and stakeholder consultations.

The livelihoods asset model developed in earlier research by SEI, which recognizes 5 capital assets-physical capital, human capital, natural capital, social capital and financial capital for rural livelihood for hill communities will be applied to identify problems, needs and priorities of different stakeholder. Patterns of livelihoods and resource management will be assessed using focus group discussions, wealth ranking, household and key informant interviews.

Action planning to identify and pilot options for improving community-based water and land resource management will be undertaken and the pilots will be carefully monitored to test their effectiveness in resource, economic and institutional terms. These pilots, combined with reviews of experiences from other parts of the world, will be used to define models of good practice that could be adapted for use elsewhere. Given the diversity of environmental and social conditions in the hills, defining what will work which locations will be critical.

### ***Sub-basin Level***

The sub-basin will be a representative mix of water, land and forest resources, management practices and that has a well-established community forestry process with a number of effective and sustainable FUGs. An assessment, using secondary, field and remotely-sensed data fed into a GIS, of the overall hydrology, water management and land and forest resources of the selected sub-basin will be made, to provide a data framework that will both act as a baseline for assessing change over time and a basis for information for and negotiations with stakeholders in the sub-basin. The methodology developed for this assessment will be documented, to provide a basis for similar initiatives in other sub-basins.

The institutional links between different communities, between FUGs and local government at local level and between communities and government agencies responsible for different forms of support to resource management and development will be developed. The GIS system, linked to participatory management, will also be developed to plan and co-ordinate support to the institutional processes.

The National Water Users' Federation and the Federation of Community Forest Users' Association have shown interest to participate in this study. They will mobilize their respective units at the district and local level for community and sub-basin level study and will organize the dialogue on integration of activities at the local, district and central level. They would also contribute to the formulation of recommendation by participating in the central level policy dialogue.

### ***Macro Level***

The program of action research and local-level institutional development will be complemented by work at the macro level. It is generally recognised that the policy, legal & institutional environment at the macro level conditions development possibilities at the local level. This is particularly true where, as in this case, the initiative involves substantial changes to existing institutional processes and mandates. In consequence, reviews of the legal, policy and institutional context of the proposed approach will be undertaken and dialogues with key stakeholders in the policy process will be initiated, based on a model for policy analysis developed by SEI.

These will be complemented by reviews, based on secondary sources, of similar initiatives and management options in different parts of the world. These reviews will consider both technical issues (what options provide models of good practice for improved resource management) and socio-institutional issues (especially what types of institutional arrangements will ensure effective, sustainable and equitable representation of all stakeholders for integrated management of resources).

### **Roles of project researchers and institutions**

1. Dr. Dhruva Pant will lead the study team and will guide the work of other team members besides overseeing the overall project implementation by ensuring

- coordination among participating individuals and institutions. He is also the team's expert on institutions for water management in the Himalayas.
2. Dr. Christopher Scott will provide conceptual and methodological input for the design of the study focusing on hydrology, water and land management.
  3. Dr. David Molden will provide conceptual input for water and land productivity.
  4. Prof. John Soussan will provide policy analysis and forest and environmental management expertise.
  5. Ms. Sabita Thapa will coordinate the field research components of the study and coordinate the gender dimensions of the project.
  6. Dr. Ravi Chopra brings extensive environmental and watershed management expertise and will coordinate the Uttaranchal activities and link with IWMI and SEI researchers on methodology and cross-comparison with Nepal.
  7. Dr. Khem Raj Sharma (DOI) will oversee the Nepal component of the study by providing policy inputs besides facilitating the policy dialogue at National level among related government agencies and other stakeholders.
  8. Dr. Binod Bhatta brings extensive forest management expertise and will coordinate the Nepal field studies.

## Outputs

The following output will be generated through this study.

1. Documentation of the policy, legal and institutional provisions and its effect in promoting integrated natural resource management in order to recommend innovative approach for appropriate policy measures for integrated approach.

This output will build on the analysis of existing provisions and its application vis-a-vis existing institutional structures for integrated management of natural resources. The output will also build on the experiences of policy makers and other stakeholders through the policy dialogue at various levels.

2. Information on community-level water, land and forest resource flows, needs and management regimes, along with poor households' livelihoods and food security strategies in one multi-community Sub-basin each in Nepal (focusing on Irrigation and Forest User Groups) and Uttaranchal in India (focusing on Watershed and Forest Management Committees). **The information will be disaggregated where possible to look at the gender dimension of resource use and management.**

This output will build on traditional and existing program experience as well as relevant research linked to local communities. Beside the experiences of stakeholders for the management of the resources and analysis of existing institutional structures will help in achieving this output.

3. Documentation of management practices, mobilisation and formation of pro-poor community-level institutions for integrated water-land-forest management at a sub-basin level based on experiences of existing resource management groups.

This output will develop and document successful watershed, irrigation and forest user groups that effectively represent and empower poor women and men to manage their natural resources, particularly water and forests in a sub-basin context. These local institutions will provide a basis for extending their mandate to other aspects of resource management and livelihoods development (many are already doing so informally, but with limits on their control over other parts of the resource base) as well as to interact with government and other external institutions necessary to establish the wider resource management mandate.

4. Scaling up pilots of community-based integrated resource management and livelihood security concerns effectively communicated to the policy makers and other stakeholders through policy dialogues.

Based on output 2 and 3, this component will seek to link multiple communities within a sub-basin in order to explore, develop, and scale up win-win natural resource solutions. Under the recognition that uncoordinated resource development practices can have serious downstream implications, the intent is to internalize what are often referred to as externalities. Multiple and complementary resource use practices along elevation and agro-ecological gradients are well-known features of mountain environment livelihood strategies; however the intrinsic inter-relationship (primarily hydrological) among separate agro-ecological niches within a larger sub-basin have not been adequately explored or documented. Similarly, upstream-downstream community social and institutional interdependence have been documented but without due attention to the implications for sub-basin scale management of resources.

Existing links with key institutions and policy makers will be built on to establish the changes to policies, institutions and other processes that are needed to generalize and successfully upscale the pilot activities. The key institutions include the Water and Energy Commission Secretariat and Departments of Irrigation and Forestry (Nepal) and the Watershed Directorate and Forestry Department (Uttaranchal). Via a series of policy roundtables and published policy briefings, the outcome will be to instill institutional integration at the state and national levels and to ensure that food security and sustainable livelihoods are scaled up and incorporated in future policies in Nepal and Uttaranchal.

The outputs will be published in the form of research reports, journal articles, local language guides, and policy briefings. The research will support the field research of at least one PhD or MSc students from India and Nepal for each of the pilot areas.

## **Beneficiaries and impact**

Immediate beneficiaries will be poor women and men in the communities in Nepal and India with whom field experiences are developed.

Immediate target institutions are the Governments of Nepal and Uttaranchal institutions responsible for water, land and forest management, along with wider policy and civil society institutions. The proposed research will contribute to the identification of modalities of Integrated Water Resource Management at the sub-basin/basin level as envisaged in recently formulated Water Resources Strategy of His Majesty's Government of Nepal and the integrated development approach as set out in the new Watershed Guidelines of the Government of India.

Wider beneficiaries will be poor people in Nepal and India should the models be adopted in the national or state policy processes.

Wider target institutions are agencies and policy makers elsewhere in the developing world who are concerned with developing integrated local-level resource management.

The research help develop linkages between currently existing resource management institutions at local level and that could facilitate the development of higher level institutions for integrated natural resource management at the sub-basin level. This could have important implications for moving the Integrated Water Resources Management agenda beyond purely local or purely large river-basin levels.

In relation to 'pathway to impact', this project will begin at 'conceptions of options' (see pathway to impact) and will test the concept through action research to achieve scale 2 in pathway. If the stakeholders find the concept applicable, then it may have some effect on scale 3 through adoption at local level. The scale 3 is not achievable in the project period at the policy level but will pave the way for policy dialogues for adoption of the recommendation and also further research to validate the concept to achieve impact of the project.

## **Assumptions and risks**

The primary assumptions to this study are that local resource users, key government institutions and policy makers see the need of this study and their commitment and support to the study is available. Communities and institutions are expected to be receptive to the development of integrated local level resource management. As outlined in the methodology section above, the role of primary stakeholder- resource users and the secondary stakeholders-policy makers is important and they are expected to co-operate in the implementation of the study. Besides, adoption of improvements to community-based water management in state and national policies and program are incorporated. An additional risk, though one that has been considerably reduced, is that the political situation hinders effective fieldwork.

## **Monitoring and Evaluations Plan**

Monitoring and evaluation will be an integral part of the research study. A set of indicators will be developed to measure the implementation of each of the project's activities. The outputs expected from implementation of each of the activities will be the basis for performance measurement. The monitoring and evaluation will have a participatory character and will be carried out in collaboration with the local stakeholders. Evaluation of implementation of each of the activities will be carried out in every six months. At the end of each year project implementation evaluation will be carried out. This is expected to help in taking corrective measures during the implementation of each of the activities. Mid term evaluation of the project will be carried out at one and half year implementation of the project to see if the project objectives are attainable. Necessary changes, if required will be made in the design of the study to achieve the objectives and goal of the project. The final evaluation of the project will be carried out at the end of the project. The evaluation will look into whether the project outputs were achieved. A final study report will be prepared besides case studies from the research.

## **Dissemination strategy**

The primary vehicle for dissemination will be policy briefings and public goods publications generated under Output 4. IWMI and People's Science Institute have developed excellent working relations with senior officials in the Watershed Directorate in Dehra Dun, Uttaranchal. IWMI has working relationship with WECS, which has representation in Consultative Committee for IWMI activities in Nepal, the Department of Irrigation and IWHRD, the institutional partners in Nepal which has expressed priority for participatory research on upstream-downstream water resource management. SEI has strong links with the Department of Forestry in Nepal and active NGOs in Nepal and India. These links will provide for effective dissemination of policy findings and recommendations.

Local language dissemination of results and recommendations for concrete actions will take place through PSI's Jal Sanskriti (Water Culture) program in Uttaranchal, irrigation bulletin of Department of Irrigation and through the radio dissemination initiatives of an IWMI partner, Nepal Water Conservation Foundation (NWCF). Additionally, NWCF publishes a well-read journal titled Water Nepal. Similarly, experiences will be shared between the Nepal and Uttaranchal sites through exchange visits by community members and collaborating institutions.

The research results will be published in widely circulated journals and report series, and will be available to download free of cost from IWMI's website ([www.iwmi.org](http://www.iwmi.org)).

A series of workshops and policy briefings are programmed into the project to provide a direct means of communications with and dissemination to policy makers and practitioners in both countries.

## Resources Needed

A total of 936 days of manpower is proposed for the study. Out of this most of the work will be carried out by local manpower with 106 man days of international inputs covered through CP and 316 man days as matching fund from ARI. The manpower estimate is based on the man days input required from each of the researchers. The emphasis on the use of local researcher is to strengthen local capability in research. With major focus on socio-institutional study, most of the expenses are for field studies at the local level, without major purchase or hiring of equipment. The estimates are based on the prevailing minimum rate both in Uttaranchal and Nepal.

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