

Payment for Ecosystem Services: Practices and Perspectives in the Himalayas



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Haungshan, China**

International Centre for Integrated Mountain Development

Kathmandu, Nepal

ISSUE: *Human demand for ecosystem services is quickly growing around the world...*



FOR MOUNTAINS AND PEOPLE

Food

Food production must increase to meet the needs of an additional 3 billion people over the next 30 years

Water

One-third of the world's population is now subject to water scarcity.

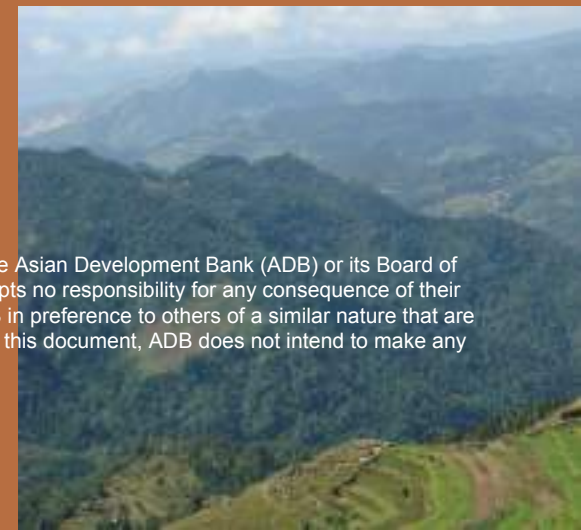
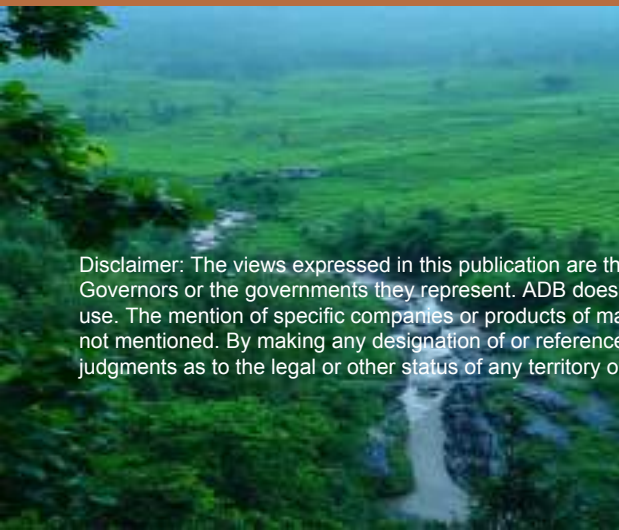
Population facing water scarcity will double over the next 30 years

Timber

Wood fuel is the only source of fuel for one third of the world's population.

Wood demand will double in next 50 years.

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2009



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National water policy
Multilayer of institutions



Water induced disaster management policy
Multilayer of institutions:



Watershed management Act; EIA for infrastructure development
Sectoral planning vs collective efforts



Forest policy; Forest, National park Act
Community forestry, NBSAP



UN Convention on Biological Diversity (CBD): all HKH countries are party: Objective 3 of CBD: Benefit Sharing

Nagoya Protocol on Access to Genetic Resources and Benefit Sharing :
Six countries in Himalayas ratified/accessed : **National Obligation on Benefit Sharing**

UNFCCC and Paris Agreement: All HKH countries are party and signatory :-
Forest and Carbon

Convention on International Trade of Endangered species of Fauna and Flora: All HKH countries are party and signatory :- **Ecological Security, Illegal wildlife trade control**

Ramsar Convention on wetlands: All HKH countries are party and signatory
: **community dependency over wetlands resources**

Forest ecosystems are fundamental to maintain water cycle (UNFAO, *forests and water strategy and action plan*)

SDG 6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes

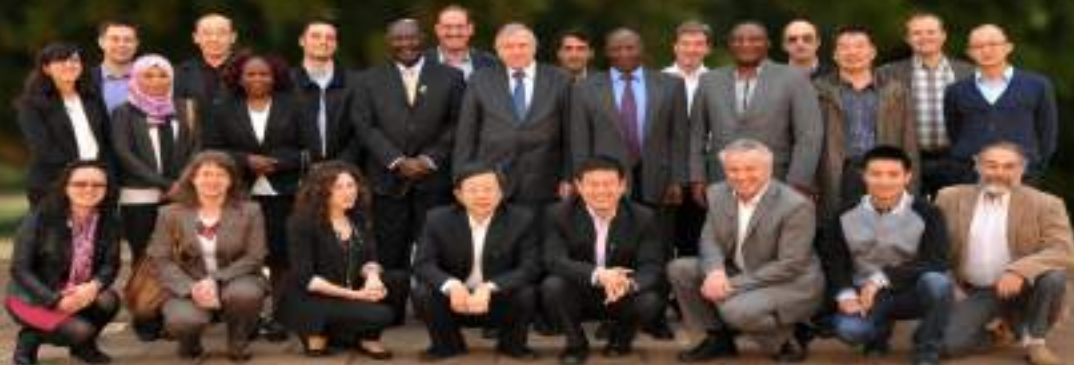
MEA 2005: highlights degrading ecosystem services, with number of drivers of change, need immediate actions both at Global and national level

Forests and Water – a five-year action plan

Increasing international action to address forest-water interactions in science, policy, economics and forest practices. An action plan of the International Forests and Water Agenda

Kunming Expert Meeting 2014

Forests and Water: From Research to Application



Forest landscape, incentives – national priority

ICIMOD

Green India Mission: Indian mountain state priority
Bhutan: by constitution , 60% forests (carbon neutral)
Nepal: Ecosystem services, biodiversity
China: Ecological civilization



NEPAL
NATIONAL BIODIVERSITY STRATEGY AND
ACTION PLAN
2014-2020

PREPARED BY
GOVERNMENT OF NEPAL
MINISTRY OF FORESTS AND SOIL CONSERVATION
SINGRADEBBAS, KATHMANDU, NEPAL
JULY 2014



Possibly: Yes



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Payment for ecosystem services: possible instrument for managing ecosystem services in Nepal

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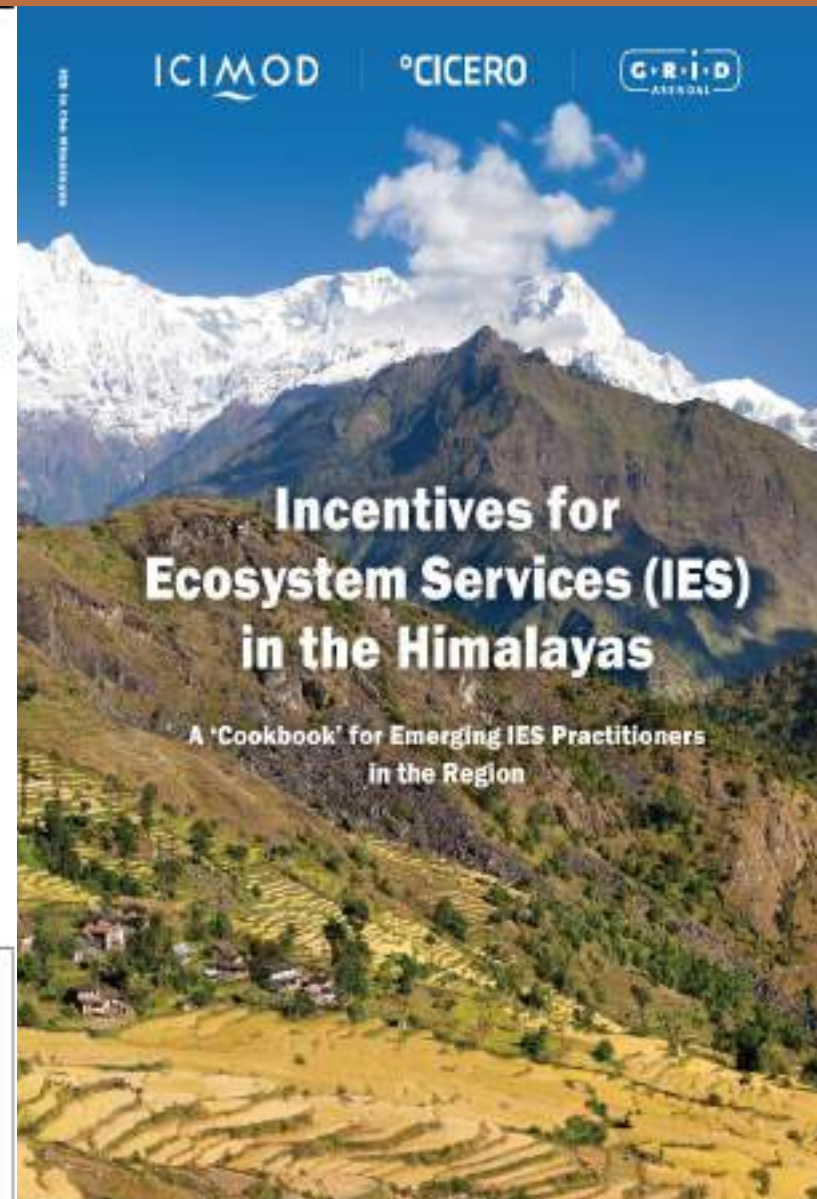
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PES Design

- Literature and document review.
- Expert consultations.

- Preliminary investigation of stakeholders, issues and existing mgmt. practices.
- Identification of factors that affect services.

Background Analysis



Institutional Design

PES

Assessing Market Feasibility

- Mapping of local areas
- FGDs
- Expert consultations.

Analysing demand and supply



- Estimation WTP of service users
- Interests of upstream communities

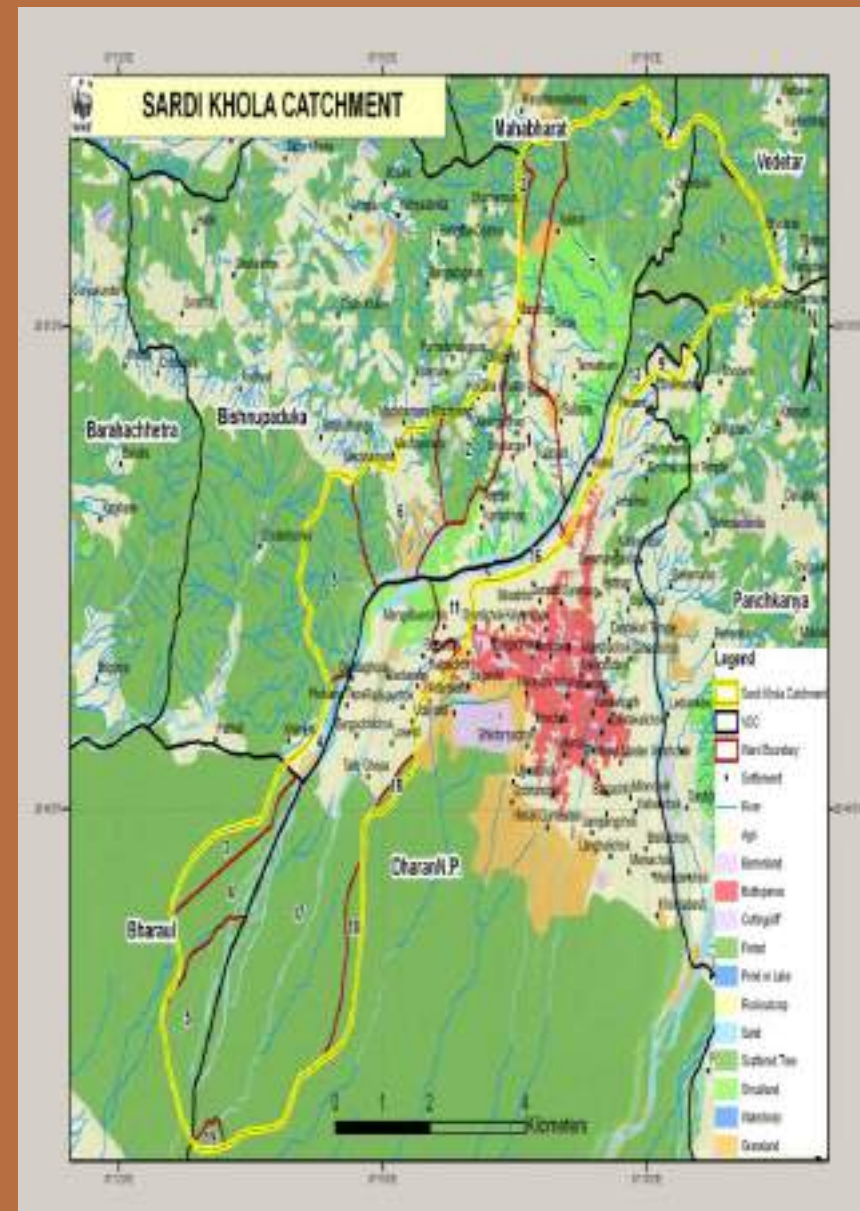
- Choice experiment design
- Household survey

- List of attributes prioritized by service users.
- Status of current and potential desired watershed activities.

- Sharing of results from CE survey and stakeholder discussions.
- Design of local level institution to implement PES.

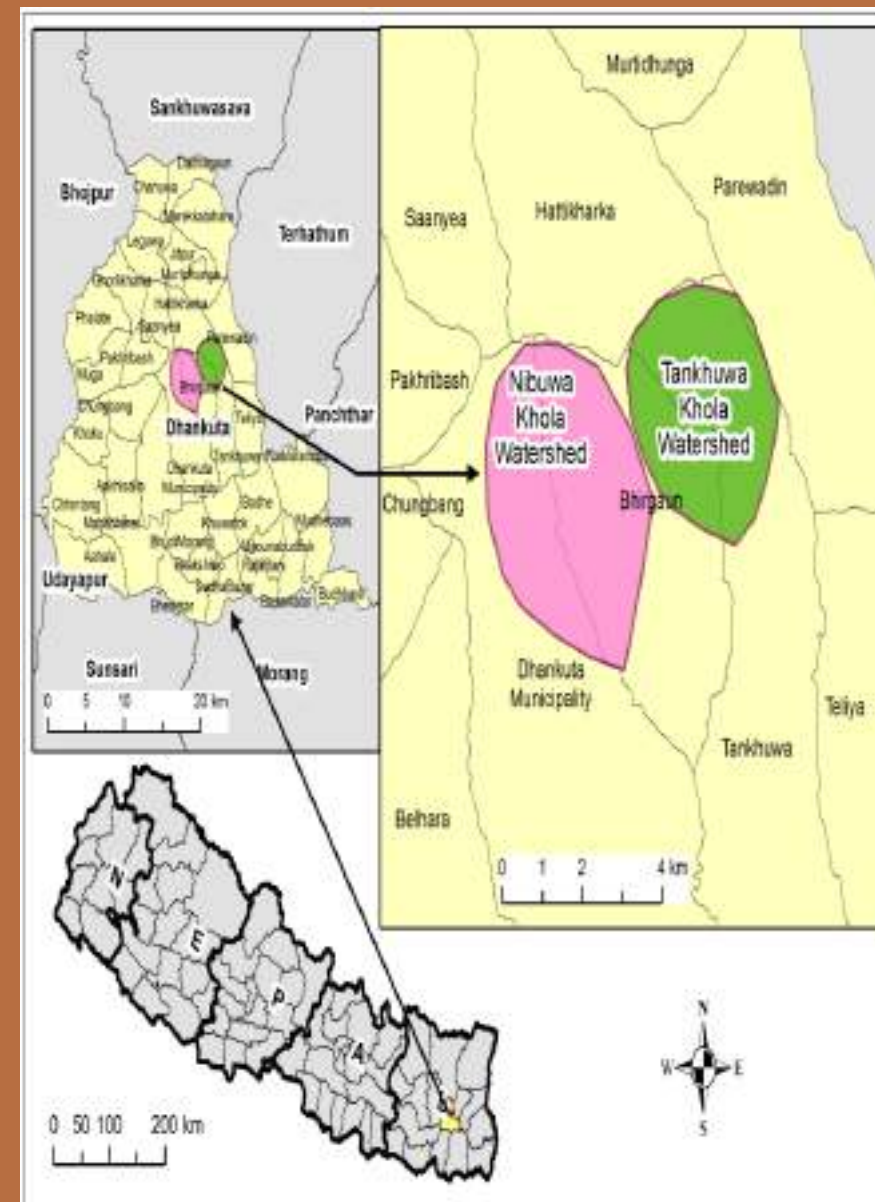
- Discussions with local stakeholders.
- Dialogue with local government and community leaders.

- 70% water supply to Dharan city (app 200k population)
- Decreasing water availability,
- Mean annual household WTP for new scenario is NRs. 502.36
- The estimated annual social benefits of the given scenario is NRs. 13.94 million for the given scenario
- Immediate need of upstream-downstream linkages, with possible payment mechanism to upstream communities



Case : Tankhukhola watershed, Dhankuta municipality

- 80% water supply to Dhankuta town
- Mean annual household WTP for 24 hour water supply NRs. 632.20 per hh/per month
- Additional WTP for erosion control and water source protection is 0.52 and 0.35
- A PES mechanism is under operational to protect upstream forests. NRs 15/hh/month payment to upstream communities





Article

Financing Watershed Services in the Foothills of the Himalayas

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Abstract: Watershed management is critical for the sustainable supply of clean water to urban centers, particularly in areas of developing countries where large-scale infrastructure projects are costly to implement. In this paper, we discuss the potential for financing improvements in watershed services in the foothills of the Himalayas through Payments for Ecosystem Services. Through the use of a choice experiment to disentangle household preferences, we show that downstream water users are interested in improvements in water quality through source water protection. Households in Dharan municipality are willing to finance watershed management to the extent of USD 118,000 per year. These payments can be used to incentivize upstream households to decrease domestic livestock grazing, change agricultural practices and reduce open defecation to improve the drinking water quality and quantity in downstream areas. The estimated cost of these activities is less than \$80,000 per year. Through discussions with local stakeholders, we propose a tri-partite institutional structure to facilitate transactions between downstream and upstream communities and to improve watershed services.

Keywords: choice experiment; drinking water; payments for ecosystem services; watershed management; water quality

1. Introduction

Local watershed management can be critical for supplying clean water, particularly in regions of the world where large water and sanitation infrastructure is costly to develop and maintain. This is especially true in the foothills of the Himalayas where water availability is affected by upstream diversions for irrigation and hydroelectricity, and water quality is influenced by land erosion from road-building, human settlements, agricultural practices and forest cover loss [1–3]. Because water use is often unsupported by modern infrastructure and management, it is significantly influenced by upstream activities and the natural regime of monsoons, avalanches and floods [4]. In this context,

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DOI 10.1007/s10668-017-9969-x



Designing community-based payment scheme for ecosystem services: a case from Koshi Hills, Nepal

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Abstract The study was carried out to design payment for ecosystem services (PES) scheme to enhance the effectiveness of existing drinking water supply project. This study determined willingness-to-pay of water users using choice experiment method and identify the willingness of watershed households to participate in the scheme by household survey. The results suggest that creating a multi-stakeholder institution at the local level, led by local body, will make the implementation of the PES feasible. This would create trust between ecosystem managers and service consumers, facilitates monitoring system and encourages their participation in watershed management. In the beginning, water users would like to pay less than their willingness-to-pay because it may take time to improve

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Ensuring Water Availability to Water Users through Incentive Payment for Ecosystem Services Scheme: A Case Study in a Small Hilly Town of Nepal

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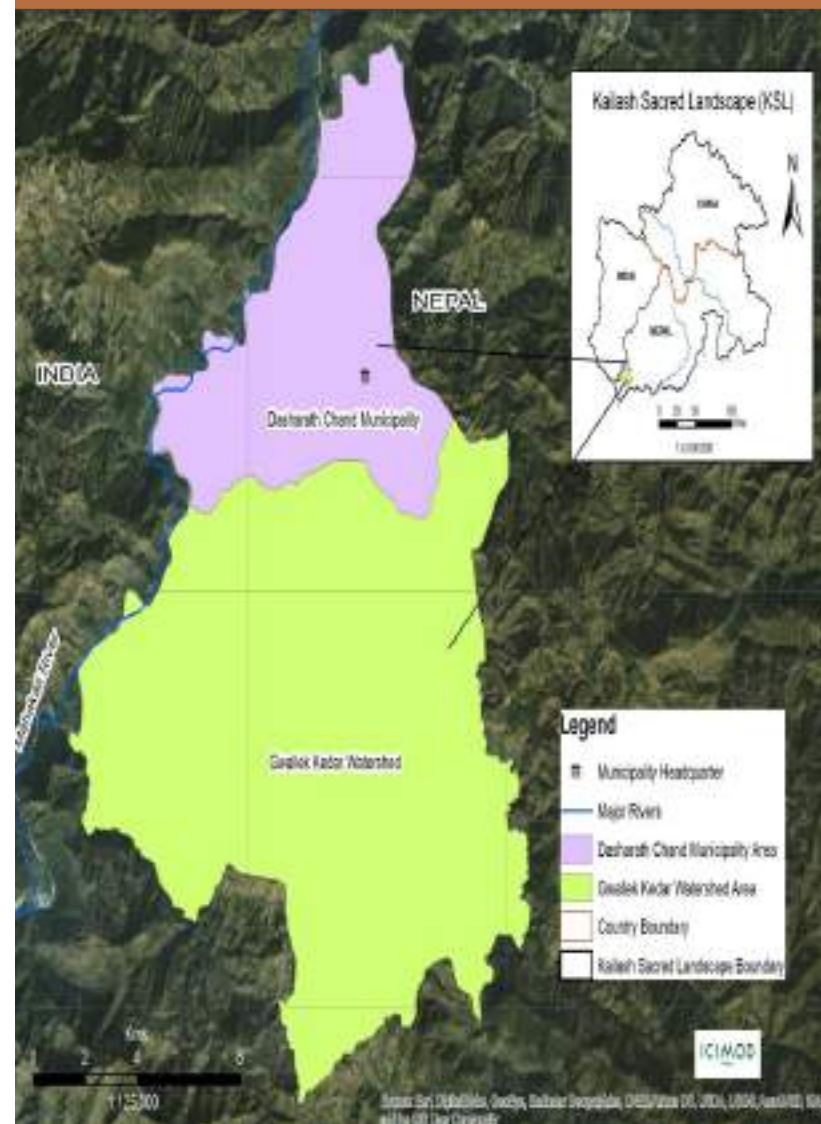
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This study was carried out to design an incentive payment for an ecosystem services (IPES) scheme in the Baitadi Town Water Supply and Sanitation Project of Nepal. The main intention behind the designing of the scheme was to develop strategy for equitable use of water resources and involve communities, watershed and water user, in the sustainable management of water resources. We administered household survey in both the watershed community and water users to elicit their preferences regarding water source management and drinking water supply. A discrete choice experiment was employed in the case of water users which showed that, for them, water quality and quantity are the most important attributes. The estimated annual willingness to pay of water users for doubling water



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-
- Legend**
- National Park Boundary
 - Highway
 - District Road, Dist Road
 - Forest (Shrubland)
 - Grassland
 - Agriculture
 - Built-up area
 - River/Stream
 - Sand Gravel
 - Lake/Pond
 - Barren land
 - Cultivable
- The map displays the Shivamogga District with its forest cover and land use patterns. The district is bounded by a purple line. The forest cover is shown in green, and the land use is shown in various shades of green and brown. The map includes a scale bar at the bottom indicating distances from 0 to 10 Kilometers.

Month	Current water provision	Water provision under delta scenario	Water use
April	65	65	62
May	66	66	62
June	67	67	63
July	69	68	67
Aug	68	65	65
Sept	65	60	58
Oct	60	55	52
Nov	55	52	52
Dec	50	48	52
Jan	45	42	52
Feb	40	38	52
Mar	35	32	50
Apr	30	28	50
May	25	22	50

Maguri Motapung Beel: Assam, India

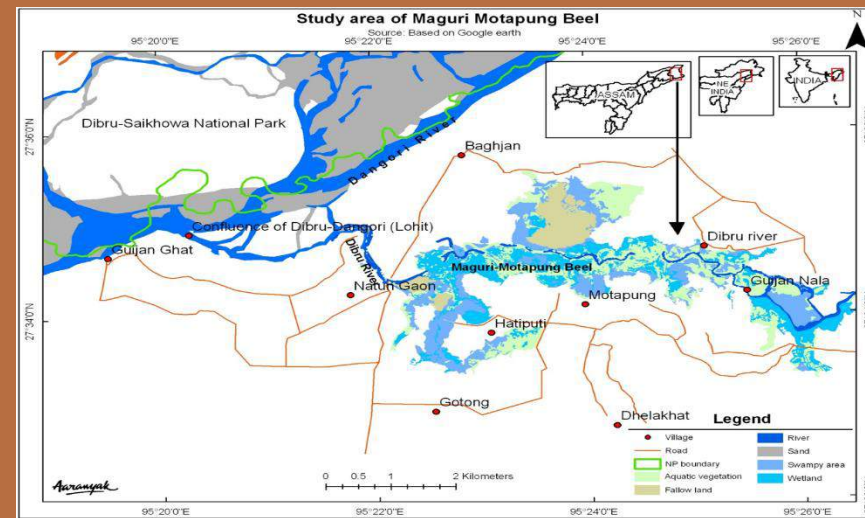
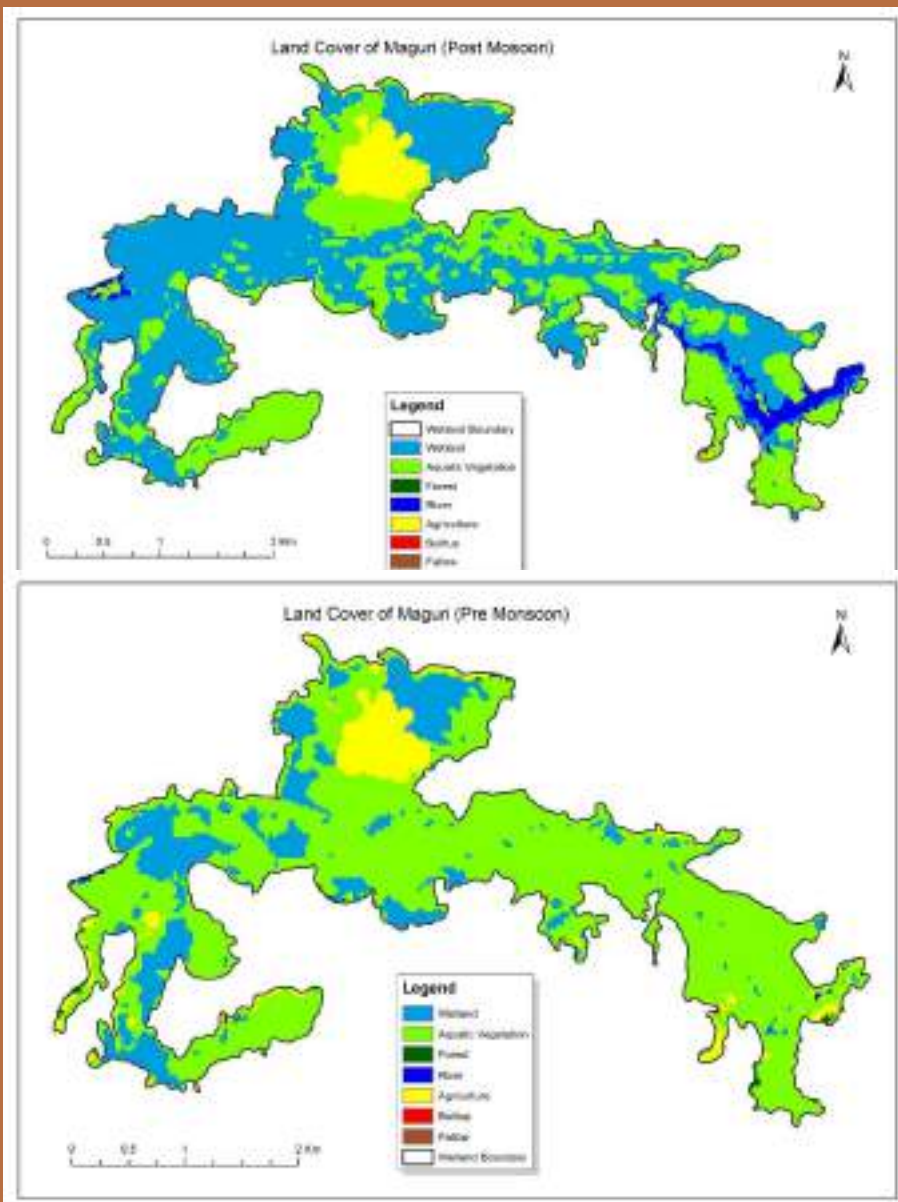
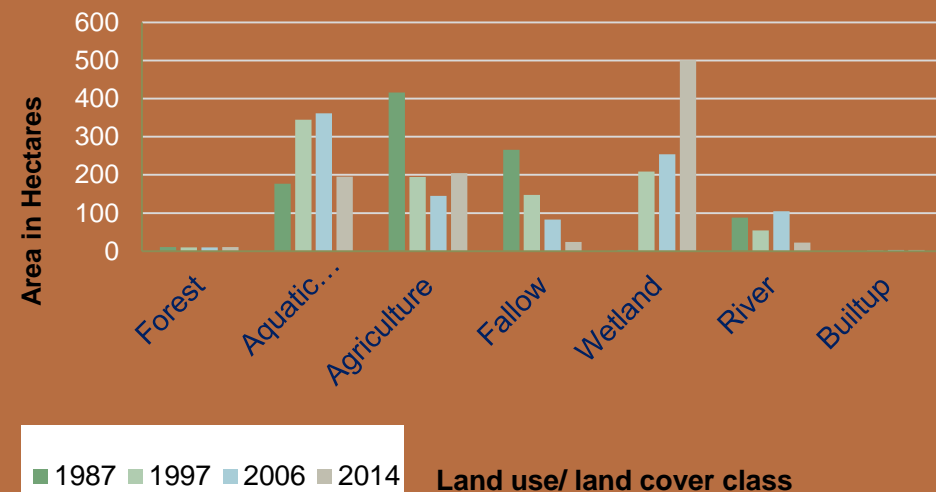
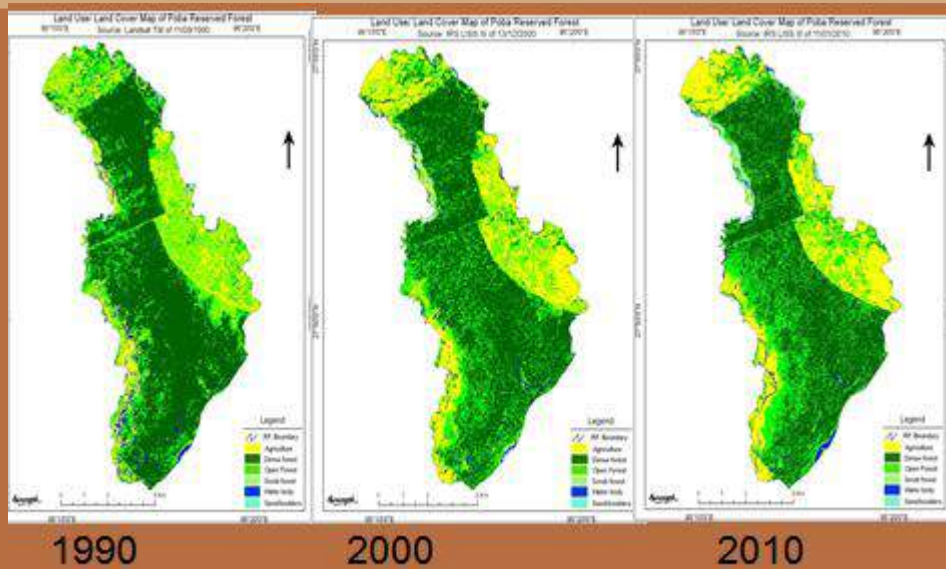


Figure1: Study area of Maguri- Motapung Beel

Analysis of Land Use and Land Cover change of Maguri Beel



Poba Reserve forests: Assam, India



Driver of Change	First preference	Second preference	Third preference	Fourth preference	Fifth preference	Sixth preference
Land Use	2	5	5	3	1	None
Illegal logging/Cutting	16	17	26	6	3	1
River cutting/flood	1	0	2	1	0	0
Over extraction	8	9	6	3	1	1
Free Access	2	4	8	3	1	0
No government plan/Management schemes	12	12	23	14	1	0
Lack of Institutional setup	1	6	5	4	1	0



Can forest stand alone? Barriers to the restoration of the last remaining rainforest in Assam, India

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SUMMARY

This study assesses the causes of forest resource depletion in the Pobu reserve forest, Assam, India. Although many activities, such as hunting and grazing, are banned, the Pobu reserve forest is being degraded. The results of a household survey show local communities have experienced a decrease in forest resources in 2012 compared to 2002. Lack of community-based institutions and proper forest management plan has opened access to the forest, resulting in illegal logging and over extraction of forest products. These activities have limited the ability of Pobu reserve forest to deliver ecosystem goods and services, and prevented forest restoration. Change in forest cover and availability of forest products has adversely affected the livelihoods of more than two-thirds of local households. The study suggests that participatory involvement of local communities in forest management can reverse trends in deforestation and forest degradation and restore the ecosystem. The forest cannot stand alone; it needs active support of the local community.

Keywords: deforestation and forest degradation, forest resources, illegal logging, livelihoods, local community

La forêt peut-elle survivre seule? Obstacles à la restauration de la dernière forêt vierge en existence à Assam, en Inde

S. RANABHAT, L.D. BHATT, R.K. RAI, B. PANT, N. TIMALSINA, P.J. DAS et N. BISHT

Cette étude évalue les causes de l'amincissement des ressources forestières dans la réserve forestière de Pobu dans l'Assam, en Inde. Bien que de nombreuses activités soient interdites, la réserve forestière de Pobu est en voie de dégradation. Les résultats d'une étude auprès des foyers ruraux montrent que les communautés locales ont été privées d'une baisse des ressources forestières en 2012, les rendant inférieures à celles disponibles en 2002. Le manque d'institutions à base communautaire et de plan de gestion



Article

Ecosystem Service Changes and Livelihood Impacts in the Maguri-Motapung Wetlands of Assam, India

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Abstract: Wetlands provide a diverse range of ecosystem services supporting livelihoods of many people. Despite their value, wetlands are continuously being degraded. There is scant information on individual wetlands, people's dependency and their exploitation at a local scale. We therefore assessed wetland ecosystem services, the drivers of change and impacts of those drivers on ecosystem services and people's dependency through a case study of the Maguri-Motapung Beel wetlands of Assam, India. Both qualitative and quantitative data were collected through household surveys, focus group discussions, key informant interviews and community workshops. The analyses showed a total of 29 ecosystem services, and high dependency on these with five out of seven livelihood strategies sourced from ecosystem services. Over-exploitation of wetland resources and siltation were reported as the major direct drivers of change with impacts on both ecosystem services and people's livelihoods. Drastic decreases in availability of thatch, fish stocks, fodder and tourism were observed. This suggests that there is an urgent need for a comprehensive participatory management plan. Actions are needed to maintain the Maguri-Motapung Beel wetlands and the flow of services in order to sustain people's livelihoods in the area. With an estimated 50% global loss of wetlands in the last century and the loss of 5,000 square kilometres a year in Asia alone, the loss of ecosystem services and livelihood impacts shown in our study may be typical of what is occurring in the region and elsewhere globally.

- Designing PES scheme is a rigorous process, which demands substantial fund. Therefore, integrating PES designing process into project design phase particularly with IEE/EIA would reduce cost and participate resource managers in the entire process,
- Output based payment may put service providers in risk because the relationship between land-use practices and production of ecosystem services is not clear. Therefore, payment based on the defined activities identified by multi-stakeholder forum may enhance the efficacy of PES scheme,
- Implementation of PES requires to established a tri-partite institutional structure involving existing local institutions,

- PES should be considered as a supplementary scheme of the existing resource management approaches. Therefore, designing PES scheme under the multi-sectoral approach would increase the welfare of both service providers and water users,
- Number of beneficiaries determines whether PES is financially feasible or not. Therefore, project having small number of beneficiaries may require external support to implement PES,
- Providing support to service providers in-kind may enhance the efficacy of the PES scheme,

and Finally.....

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Ecosystem management is rather much linked with institutions, governance, and transboundary cooperation rather technicalities