

Regional Stakeholders' Workshop on Valuation and Options for Payment of Ecosystem Services of Mountain Forests

August 22-23, 2006

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Workshop Proceedings



ANSAB

Asia Network for Sustainable Agriculture and Bioresources

New Baneshwor

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I highly appreciate the work of our research team including Prof. S.P. Singh, Mr. Indu Bikal Sapkota, Dr. Vinish Kathuria, Mr. Surya Binayee, Mr. Mukund Kumaiyan, and Mr. Prakash Katwal for their devotion and hard works, who have been striving to give this exploratory study a more practical, illustrative, and scientific perspectives. The enthusiasm and collaborative spirits of all the participants provide an opportunity to move forward in this new and challenging field meaningfully.

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Thank you.

Bhishma P. Subedi, PhD
Executive Director

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Acronyms

ANSAB	Asia Network for Sustainable Agriculture and Bioresources
CF	Community Forest
DoF	Department of Forests
DPR	Department of Plant Resources
ESs	Ecosystem Services
FECOFUN	Federation of Community Forestry Users, Nepal
ICIMOD	International Centre for Integrated Mountain Development
IDRC	International Development Research Centre
IUCN	The World Conservation Union
MP	Member of Parliament
MFSC	Ministry of Forests and Soil Conservation
NRM	Natural Resource Management
NTFPs	Non-Timber Forest Products
PES	Payment on Ecosystem Services
UA	Utranchal State of India
USAID	United State Agency for International Development
WWF	World Wide Fund

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for Payment of Ecosystem Services of Mountain Forests
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Workshop background and objectives

In order to fully appreciate the forest ecosystem services of the Himalayan Mountains, which contribute significantly to the life supporting capacity of both in the mountains and adjacent plains, there is a need to consider valuation of forest ecosystem services and incorporate them into accounting at national, regional, and other levels. This is important so as to provide enough incentives to local communities for forest conservation in the Himalayas. In this context, a regional meeting was organized involving key stakeholders and relevant organizations from India and Nepal to discuss and explore the scope of valuation and options for payment of ecosystem services of mountain forests to mountain local communities. The specific objectives were:

- To explore major ecosystem services of the Mountain Forests and identify the benefits and their receivers;
- To discuss, share, and update the existing practices and options for getting payment of ecosystem services around the world; and
- To identify possible mechanisms and policy instruments applicable to Nepal and India.

The detail of the workshop program is given in **Annex 1**, and the participants in **Annex 2**. A brief synopsis note was prepared and shared among the participants as hand-outs so as to give basic insights and make them familiar with the recent trends and developments on the valuation and payments of ecosystem services around the world. The synopsis note as such is given in **Annex 3**.

Highlights of the workshop

Introductory session

After welcoming all the distinguished guests and participants by Mr. Indu Bikal Sapkota, Dr. Bhishma P. Subedi, Executive Director of ANSAB introduced all the participants from Nepal, and similarly Prof. S.P. Singh introduced all the other participants from India. There were 25 participants representing government, non-government, research institutions, universities, donors, scientific communities, and community/users federations from Nepal and India (details is given in Annex 2) .

After this brief introductory session, Dr. Subedi highlighted the objectives and scope of the 2 days regional workshop, and shared a conceptual framework of the ecosystem services, that flow at local, regional, and at global levels, and associated beneficiaries and providers of the services. He stressed, the ecosystem service-oriented approach holds that those who provide an environmental benefit should be rewarded for doing so---provider gets principle---indicates a major advancement in conservation. The highlights as such is given in **Annex 4**. Dr. Subedi ended with warm regards and appreciation for their valuable presence, and expected a great contribution from each of the participants to make the workshop a grand success. In the meantime, Prof. S.P. Singh further elaborated the scope of the workshop, and said, this is a good opportunity for all of us to develop regional perspectives on the ecosystem services of mountain forests, identify possible activities, and look for the strategies and ways out to work together. After this, there were few remarks and wishes in relation to workshop objectives and scope.

On his remarks, Mr. Sarad Rai, Director General of Department of Forests, Nepal, mentioned that the concept of ecosystem services and its valuation and payment is evolving so as to contribute to conservation of mountain forests in a more effective way. We have been focusing on timber and non-timber forest products, now time has come to consider ecosystem services, but it is challenging area to be worked out. Thanking ANSAB for providing this opportunity to take part at the workshop, he said, he is ready to help to move this initiative ahead.

Similarly, Mr. Sardana, Chairperson of the Society for Protection of Wasteland, India appreciated the relevance of this type of regional meeting, and shared that he would be willing to contribute to advance this initiative from his side. After his remarks, Dr. Bijnan Acharya, USAID, Nepal briefly highlighted the USAID Nepal's conservation programs, and said, this is a new area to be further worked out, and we are willing to contribute on it. Dr. L.M.S. Palni, Advisor to the Government of Uttranchal expressed the need of education and extension campaigns from school children to policy makers in view of promoting conservation through appreciation of ecosystem services. He further said, we are willing to work on partnership with ANSAB and other bodies in Nepal to develop systems and policy instruments in view of ecosystem services.

Presentation and discussion session

Global perspectives and initiatives on ecosystem services

Prof. Dr. S.P. Singh, a renowned global ecologist, made an intensive deliberation and key presentation on the overview of ecosystem services taking cases and examples from around the world including the pilot initiative being carried out by ANSAB and IDRC. The highlights of his presentation are mentioned as follows.

- Ecosystem services are always in flow; their use and valuation depends on humans living both inside and outside the ecosystem.
- Valuation, however, is greatly influenced by education and institutional context.

- The key to ecosystem services are not on the products from plants and animals like food and fiber, and hide; but those products which source in ecosystem functioning: soil formation, decomposition, nutrient retention as well as leakages, nutrient cycling, carbon sequestration and modulation of climate through rainfall regimes and albedo, absorption of pollutants, water filtration, scenic beauty, evolution and biodiversity.
- Consequently, the services that flow from the Himalayan Forests to the Great Gangetic Plains with 500 million stakeholders have very high value.
- Generally only the liquid runoff water (e.g., moving in rivers) and as ground water flow perceived as freshwater resource socio-economically. Vegetation redirects liquid water to water vapor flow, thereby recycling it to rainfall. In Sahel, more than 90% of the rainfall appears to due to the ET flow from vegetated land surfaces; it could be substantial at microclimate level in Himalaya.
- Species diversity does contribute to ecosystem functioning, however it also depends on the identities, densities, biomasses, and interactions of population of contributing species within a community, as well as the aggregate abundance and spatial and temporal variation of these attributes.
- Payment examples:
 - Cost Rica (developing country):
 - Payment of water services (WS) one of the four ESs Hydroelectric generators pay for WSs. Let the central Govt. pay through Tehri project.
 - USA (developed country):
 - Real estate developers compensate for any loss caused by their projects by restoring or enhancing wetlands elsewhere
 - A market has developed that provides such services to developers, so that they do not have to undertake them themselves.

The detail of the presentation as such is included in **Annex 5**. After his presentation, the forum provided opportunities for clarification questions, suggestions and interactive discussions. The highlights of the interactive process is given below.

Dr. Bijnan Acharya: Excellent presentation, he said, what are the sources of the data being collected with the pilot initiative in Nepal and India?

Prof. S.P. Singh: In this short-term and small pilot study, we have considered three services for valuation: carbon sequestration, recreational and soil replenishment services using both primary and secondary sources of data. This is an explorative study, preparing a ground for larger projects in future.

Dr. Keshav R. Kanel: Very innovative idea, excellent deliberations, he said, this is a great initiative in terms of valuing ecosystem services, but there are other pragmatic aspects such as who captures the value is a question ---who benefits---the study was more on ecology, but who would benefit from this study, social and political dimensions of the study?

Prof. S.P. Singh: Yes, he replied, there are other dimensions too, and when there comes a talk on payment, I know, issues of equity and politics take place. In this regard, in collaboration with other stakeholders, government can play a very important role, and initiates payment policy and mechanisms. We can take example from Uttanchal, where due to the positive role of government, this has been initiated: first, there should be a policy in place, and actual payment through market based systems. He further went on saying, Nepal has demonstrated a good model in terms of decentralized forests management, and added, I see a good prospect that policy makers in Nepal can buy this idea.

Mr. Prabhu Budathoki: Congratulation to Prof. S.P. Singh and ANSAB, he commended, this study is useful basis for further intervention. He enquired, how do we balance a sustainable harvesting - flow of products; and ecological integrity and functions of a unit of forests management?

Prof. S.P. Singh: He replied, it is not easy task. We need to invest on research through a scientific framework encompassing various ecological dimensions such as forest hydrology. We need to develop understanding power to predict the sustainable harvesting that enables products as well as services to flow. In principle, harvest should be in such a way that maintains the integrity of ecosystem units for their functioning and flow of services.

Dr. Rajesh Thadani: He said, we need to consider local ecosystem services as well such as pollination services, colonisation services, and use of nurse crop. They may not be commercially viable at the beginning, but these services are to be recognized for payments. Some experiments should be carried out.

Prof. S.P. Singh: Yes, you are right, he responded, let us work together and develop a bigger research program, that includes these services as well. We need to work together involving scientists from various disciplines such as hydrologist, forest ecologist, economist, agriculture expert, and geologist.

Mr. Ananda Pokharel: Very good presentation, insightful, he said, we have about 118 ecosystem types in Nepal, and if we manage them in a proper way, value their services and establish payment mechanisms, poverty would not be an issue. So, what is the scope of this type of research to relate to policy development process? There are issues of access, ownership, and equity on the management of natural resources.

Prof. S.P. Singh: Well, he said, as we all know, ecosystem does not function based on political boundary; watershed level or landscape approach of governance and development would be an idea. Research provides information and basis for policy development. It is on the side of policy makers, whether they want to use the research information to decide on policy changes. Nepal has a good scope to take advantage in this sense, and he added, he sees a good potential. Government can take a lead role and be very active. The key approach should be to provide incentives to conserve mountain

forests. There are examples, such as, in some parts of India, government pays IRs 8,000 annually to *Jangalee Jee*, who conserves forests.

Dr. R.B.S. Rawat: As I understand from Prof. Singh, PES is a difficult concept, it is complex to understand and rationalize. However, we need to put continuous efforts to make the services saleable and get benefits to the poor mountain communities. With this foundation work of 18 months-ANSAB project, we need to build up a bigger intervention, and ANSAB has created a good platform to go ahead. Now, my concern is how can we take bigger project?

Prof. S.P. Singh: He replied, he also wanted the same, and further said, ANSAB, ICIMOD, IUCN, and other organizations can work together. This workshop is a milestone in this sense, he ended.

Valuation of recreational services of Nepal and Uttranchal Mountain Ecosystems

Dr. Vinish Kathuria, Environmental Economist from Madras School of Economics made a brief presentation on the valuation of recreation services of Nepal and Uttranchal Mountain Ecosystems, and this valuation is a part of the pilot research project being undertaken by ANSAB. The highlights of his presentation are mentioned as follows.

- To estimate the recreational value of Himalayan Forests, the present study uses a revealed preference method i.e., the Travel Cost Method (TCM). The basic premise is to use the cost of travel as surrogate for the willingness to pay for using different sites in Himalayan forests. Besides actual transportation costs, the travel costs may also include tariffs paid at hotels and the opportunity cost of travel time spent on journey, as a proxy for asset value of the recreation site.
- A total of 369 tourists – 242 domestic and 127 foreign tourists were selected from Chitawan National Park, Pokhara, Nagarkot, and Langtang National Park at random in the month of February and March 2006 in Nepal.
- The analysis and results based on 242 domestic tourists falling in total 49 zones of the 4 sites show that the value derived from tourism in the Himalayan Forests is to the tune of NRs. 4.06 million (i.e., NRs. 273 per hectare) to Rs. 5.06 million (i.e., NR. 323 per hectare) depending upon which functional form we take.
- Similarly, the value of Himalayan forests for foreign tourists comes out to be US \$ 1.04 (log-linear model) to 1.85 million (linear model). The total tourism value from Himalayan forests are falling between US \$ 272 – 526 or NR 18490 to 35797 per hectare respectively depending upon the functional form assumed.
- The analysis shows the applicability of zonal TCM in the case of Himalayan Forests. Though the values obtained are underestimate of the total value which people are willing to pay to preserve the forests, as the method captures only the use value of local tourists.
- However, there are some limitations of the TCM. The first problem is the truncation bias. Since data in the TCM is collected through on-site survey, only the users i.e., the tourists who can pay for the travel and other things are included.

Non-users – the people whose visitation rate is zero as a result of higher travel costs – are automatically excluded from the analysis. This truncation bias leads to faulty demand estimate and hence the consumer surplus estimates. Another problem with TCM is that the identical preferences are assumed for all the individuals. As the TCM constructs a single demand curve for a large number of individuals, this assumes identical preference for all of them.

- Moreover, he said, the data analysis of recreational services of Uttaranchal part and soil replenishment services is under-going, too early to discuss the results.

The detail of his presentation as such is given in **Annex 6**. There was a brief discussion and some clarifications after his presentation, especially in the aspects of methodology and selection of survey sites.

Global warming and carbon sequestration in Himalayan Forests

As a part of the pilot research project, Mr. Mukund shared the initial outcomes of the studies in terms of carbon sequestration of the Himalayan Forests. Key highlights are as follows:

- Carbon sequestration is the reduction of atmospheric carbon stock by removing carbon from the atmosphere and storing it in soil or biomass.
- Uttaranchal:
 - In relatively undisturbed forests carbon sequestration rates in total biomass (above ground plus below ground) generally range between 4 and 5.6 t c /ha/yr, which are similar to those reported for tropical forests.
 - However, the average values of sequestration are about half as much as above. This gives a total amount of sequestration in entire forest area of Uttaranchal - about 6.6 million t c per year. Its value at the rate of US \$13 per ton carbon comes to US \$85.5 million or about 3.1 billion Indian rupees or NRs 5 billion (1 US \$= IRs. 46; 1 US \$ = NRs. 72).
 - Among the forest types the major contributors are temperate broad leaf forests, temperate conifer forests, and sub-tropical pine (*Pinus roxburghii*) forests.
 - The temperate broadleaved forests generally include oaks (*Quercus spp*), and temperate conifer forest silver fir (*Abies pindrow*), deodar (*Cedrus deodara*), and blue pine (*Pinus wallichiana*).
 - The total amount of carbon in soil up to 150 cm depth is estimated 263.6 million ton which is similar to carbon contained in forest biomass, 267 million tonnes.
- Nepal:
 - Forests of Nepal are quite similar to those of Uttaranchal, particularly in the western part. Domination of sub-tropical pine (*Pinus roxburghii*), Oaks (*Quercus spp*), Sal (*Shorea robusta*), and silver fir (*Abies pindrow*, *A. spectabilis*) can be seen also in much of Nepal.

- However, if one goes to eastern part of Nepal the forests become clearly more diverse. Data on stem volume of most of the species of Nepal other than parks and centuries are available (Forest Resources of Nepal, 1999).
 - We have used values of total stem volume and stem density to estimate the carbon.
 - As for estimation of productivity we have used appropriate quotients derived from studies in Uttaranchal and in certain sites of Nepal.
 - Fifty percent of dry mass is used as carbon values.
 - In recent years with the wide spread institutionalization of community forest user groups forest stands have shown recovery in general.
 - A study showed that *Shorea robusta* plantation increased the top soil organic carbon from 0.7% to 2.3% in 30 yrs time (Malla 2002)
 - A total amount of carbon in entire forest area of Nepal - about 126 million ton.
- Agricultural and forest carbon sequestration are important components in response to a greenhouse gas emission.
 - Sequestration should not be treated the same as abatement/reduction.
 - Sequestration always has the potential to be temporary, however, it does affect the path of reaching long run targets.
 - Most community forests have the potential to be good carbon sinks, but measures needed along with community participation.
 - Developed world has for long been enjoying modern energy inputs such as fossil fuels.
 - A major policy change is needed for allowing the communities in developing world to make use of the fossil fuel while it lasts in order lessen their dependence on forests for their energy needs, and consequently improving the forest cover.
 - On the whole, it does not matter whether the reduction is done by sequestration or emission abatement as long as there is less carbon in the atmosphere.

There was a brief discussion and some clarifications after his presentation. The detail of his presentation is given in **Annex 7**.

Sharing and updates of similar initiatives

Mr. Shyam Upadhaya from Winrock International, Nepal shared RUPES (Rewarding Upland Communities of Kulekhani Watershed for Ecosystem Services) experiences in the floor. This program aims to build capacity of local communities, institutions, and government agencies in Kulekhani watershed to identify and utilize rewards (payments) from environmental services to promote sustainable natural resource management and poverty alleviation among poor upland communities. Research works under this program has demonstrated that by conserving forests communities living in Kulekhani watershed are providing valuable ecosystem services in the form of reduced sedimentation and improved water flow to Kulekhani reservoir located downstream. These services are benefiting two hydropower plants that utilize water from Kulekhani reservoir by making more water available for electricity generation. The program is trying to develop a

mechanism for rewarding upland communities for providing these services by transferring a part of benefits of ecosystem services received by hydropower plants to them. Winrock is also helping to identify and develop Clean Development Mechanism (CDM) projects in biogas, hydropower, solid waste and other renewable energy sectors and build national capacity in these areas.

Mr. Prabhu Budathoki, Country Representative, IUCN Nepal, shared that IUCN Nepal has started working in this sector recently. It is working in coordination with its regional programs, and plans to escalate this sector in Nepal. Accordingly, environmental economics has been prioritized as one of the five thematic areas in IUCN Nepal's new program strategy (2007-2012). This thematic area emphasizes to work in five major components, viz. 'trade and environment', 'green accounting', 'business and biodiversity', 'economic valuation', and 'conservation finance', however, in the initial few years the focus will be more on later three components. In this line, IUCN has recently completed a study entitled "Investigating the Delivery of Ecosystem Economic Benefits for Upland Livelihoods and Downstream Water Users in Nepal" in the Shivapuri National Park. Major costs and benefits of park management were analyzed for upstream people, downstream people and the state. Study findings indicated a good potential for piloting Payment for Environmental Services (PES). Three policy briefs (on conceptual framework, on methodological foundations, and on costs and benefits of conserving Shivapuri National Park) and one poster (in Nepali) are produced as output of this project for wider dissemination.

Mr. Budathoki added, currently another similar initiative is underway in coordination with WWF Nepal and CARE Nepal; wherein efforts are made to value important goods and services from Churia hills of Nepal so as to reflect its value to livelihoods of local community, and national and global economy. Besides, it endeavors to look at the possibility of piloting PES in the region. With CARE Nepal, we are also working on a project idea on community monitoring of ecosystem services. Economic valuation and piloting PES are integrated into IUCN Nepal's field projects, and will be implemented in coming years.

Similarly, Dr. G.C.S. Negi, G.B. Pant Institute of Himalayan Environment and Development, Kosi-Almora (Uttaranchal), shared preliminarily findings on ecosystem functions and services provided by Oak and Pine forests in the Central Himalayan region. He showed a comparison of Oak and Pine forests products obtained and revenue generated in Almora, India. He further shared the future activities to be done in this direction such as quantification of ecosystem goods and services, valuation of these services and putting the values in ecological economics framework, and advocacy for sustainable forest management to enhance the ecosystem services and quality of life.

Every other participant also shared some of their activities in the areas of conservation of Mountain Ecosystems. Dr. R.B.S. Rawat, Medicinal and Aromatic Plants Programme in Asia (MAPPA), ICIMOD, shared some of the on-going medicinal and aromatic plants conservation activities, and informed the floor that MAPPA would be willing to specifically work on PES with other partners. He suggested, ANSAB can take a lead in

this area. Dr. Keshav Kanel highlighted the community forestry framework and shared that they would support ANSAB and other organizations in this endeavor, that creates economic incentives to mountain communities for conservation. Dr. Bijnan Acharya recalled the RUPES initiatives, and said that USAID will put a good priority in this area to promote conservation of biodiversity. FECOFUN Chairperson Mr. Bhim P. Shrestha suggested that they would be continuing in working for the rights and incentives for local communities for conservation of mountain ecosystems through collaboration, advocacy, and policy impacts.

Similarly, Mr. Hari K. Sainju shared on-going activities of Department of Plant Resources, Nepal, and expressed a commitment of contributing to PES initiatives. Dr. Pushkin Phartyal shared his experiences in relation to PES on policy perspectives in Uttranchal. Dr. Rajiv Semwal from LEAD India shared the willingness of their organization to become part of the PES initiatives in the future.

Groups work and group presentations

Participants were divided into two groups: one formed by participants from Nepal, and another from India. Each group focused their discussion on ecosystem services and their benefits/beneficiaries, key learning/lessons, possible options/policy tools for PES (payment on ecosystem services), opportunities and gaps/challenges, possible activities, role of different stakeholders, action planning and ways to move forward. After the group works, each of them shared at the plenary forum. The highlights of their presentations is given as follows.

Group 1: India

Ecosystem services and benefits:

Ecosystem services	Benefits	Remarks
Soil formation	L	A
Fertility replenishment/maintenance	L+R	A
Nutrient movement from one ES to another	R	B
Carbon sequestration	G	A
Biodiversity	L+R+G	A,B
Air purification	L+(R)	B
Water purification	L+(R)	A
Hydrological regulation	L+R	A,B
Recreation	L+R+G	A
Pollination	L+(R)	B
Microclimate regulation	L	B
Maintenance of atmospheric moisture	L+(R)	B

Minimize Albedo/solar radiation	L	B
Seed dispersal	L	B
Landslide/slip stabilization	L	A

Note: L=Local, R=Regional, G=Global, A=Currently data available, B= Comparatively difficult to data collection.

Key learning/lessons:

- Quantification is possible but riddled with assumptions.
- Lack of awareness about forest ESS at various levels.
- PES for whom and by whom?
- What are the mechanisms for PES?
- How to involve different stakeholders?
- Quantification of tourism/recreation services initiated.

Possible options/policy tools for PES:

- If these services are local in nature, PES will have less validity.
- Requirement of scientific data and on socio-economics and demography.
- Existing institutional framework.
- Establishing baseline.
- Impacts of recreation.
- Tradeoffs between goods and services.

Opportunities:

- ESS global and regional in nature, establishing PES is easier.
- Explore and value lesser known natural resources.
- Variety of agro-climatic zones.
- Many national institutions.
- Proximity for influencing national perspective.
- Higher literacy.

Gaps/Challenges

- Lack of integrated approach.
- Lack of coordination among key players.
- Present development paradigms being still pursued.
- Out-migration from the hill homes.
- Lack of national perspective on mountains and hill region.

Different stakeholders:

- Communities
- Government
- Autonomous institutions: R&D Organizations
- Local bodies

- Tourists
- Outside stakeholders, e.g. donors
- Elected representatives

Action planning and ways to move forward:

- Hold dialogues to create awareness among stakeholders.
- Establish baseline information database.
- Identify ESs that can be valued based on available information.
- Prioritize services that have immediate bearing on conservation and livelihood security.
- Develop methodology for appropriate instrument of valuation.
- Communicate effectively by all available means.

Group 2: Nepal

List of services, providers, and receivers:

Carbon-sequestration; tourism and recreational services; hydrology—drinking water, irrigation; soil fertility, increase in agriculture productivity; pollination; water vapor; colonization; gene pool conservation; conservation of rare and endangered species; protection of cultural heritage, religious places.

Services	Providers	Receivers consumers	Is PES existing?	Remarks
Recreational services	Government and communities (FUGs)	Domestic and foreign tourists	Yes, as entrance fee, lease fee, license fee	
Irrigation	Upstream communities	Downstream farmers, communities	Partly yes, levy systems and some traditional practices	Doti?
Drinking water	Upstream communities, watershed managers	Downstream communities mainly urban population; drinking water supply corporation, government	No	There is a demand to be paid – conflict on rights, responsibilities and ownership of water sources??? (Matatirtha, communities charge for water)
Hydropower	Upstream communities	Hydropower company; central and local government; electricity consumers	Existing in Kulekhani – recently initiated	
Carbon sequestration	FUGs, national parks, department	Global community	No	Model available in other countries

	of forest, private forests owners			
Biodiversity	Local communities, DoF, national parks, farmers	Local, regional, and global	Not clear???	Donor funding such as GEF??
Soil formation and replenishment of fertility	Upland farmers, local mountain communities, DoF	Downstream farmers – local and regional	No	Collaborative research
Flood/sedimentation control	Forest managers	Downstream communities – populations (local and regional)	No	Bilateral research required
Ground water recharge	Forest and watershed managers	Downstream farmers and populations – local and regional	No	
Pollination	Forest managers; tree growers	Farmers	No	Need research works
Air pollution control	Forest managers; tree growers	Local populations	No	

Possible policy options and mechanisms:

- Agreed national principle – political commitment of the government
- Policy towards provision of payment of ecosystem services
- Increase awareness and understanding among stakeholders and local communities
- Action research – piloting and up-scaling
- Institutional mechanisms for research – national and regional
- Alliance building – mountain forums –advocacy and lobbying e.g. recognition of natural forests for carbon sequestration to benefit from Kyoto mechanism

Opportunities:

- Over 80% mountain ecosystems, providers of the services
- Existing institutional framework and efforts conducive to PES
- Broad receivers base: local, regional, global receivers of the services, even in Gangetic plains—500 million population
- Increasingly recognized concept – PES; appreciation of the services
- Nepal is innovative to adopt new policy such as community forestry....likely to adapt PES policy

Challenges:

- New area, information gap, human resources - expertise
- Limited research capacity
- Investment for research
- Difficult to assess total value of ecosystem services

Indicative activities and role of stakeholders:

- Raise awareness among policy makers, government officials, service providers, receivers, and other stakeholders thru meetings, workshops, educational materials, TV, Radio programs, Seminar – by NGOs, INGOs
- Include ESS studies in universities, college, school curricula, courses-----by universities, government, civil society, journalists, researchers
- Build and strengthen network and alliance – by NGOs, CBOs, national level federations
- Carry out collaborative research – carbon, soil, water and other services such as pollination---- by universities, NGO/INGOs, research institutions
- Carry out action research and piloting - valuation and payment mechanisms – design, test, up-scaling, policy feedback, then policy development-----by NGO/INGOs, universities, research institutions, regional organizations
- Participate in international forums, meetings----lobbying for broader policy development ----- by government, civil societies, research organizations, donors

Action plan:

- Organize a national stakeholders workshop – Sept to Dec 2006----IUCN to coordinate
- Identify program areas, develop concept, prepare bigger research proposal and access to donors----By March 2007-----ANSAB to coordinate
- Build and strengthen ESS Alliance – national level----By March 2007----ANSAB to coordinate, relevant organizations and stakeholders including climate change group of Nepal.

Closing of the workshop

As reflected by most of the workshop participants, the workshop was very useful, insightful, and the presence of a wide range of stakeholders from Nepal and India made it possible to make common understanding, regional perspectives, and share ideas and strategies on possible actions and key issues in relation to PES. Most of the participants offered their commitment to move the PES initiatives ahead, and agreed to work together. They also opined that ANSAB should continue coordinating PES initiatives and program development involving all relevant stakeholders at regional level.

At the end of the workshop, Dr. Bishma P. Subedi made closing remarks. He said, ANSAB is grateful to all the distinguished participants, experts, and scientists from Nepal and India for their valuable presence and contribution to meet the workshop objectives as well as for their commitment to move this initiative forward. Thanking IDRC, USAID, Ford Foundation and other organizations for their all types of assistance and advice, Dr. Subedi appreciated the work of research team including Prof. S.P. Singh, Dr. Vinish, Indu, Surya, Mukund, and Prakash for their devotion and hard works. Dr. Subedi also thanked INSA (Indian National Science Academy) for providing workshop venue and other logistics support. Wishing all for the nice travel and good time, he closed the workshop.

Annex 1: Program detail

In an effort to fully appreciate the forest ecosystem services of the Himalayan Mountains which contribute significantly to the life supporting capacity of both in the mountains and adjacent plains, there is a need to consider valuation of forest ecosystem services and incorporate them into accounting at national, regional, and other levels. This is important so as to provide enough incentives to local communities for forest conservation in the Himalayas. In this context, a regional meeting is organized involving key stakeholders and relevant organizations from India and Nepal to discuss and explore the scope of valuation and options for payment of ecosystem services of mountain forests to mountain local communities. The specific objectives are:

- To explore major ecosystem services of the Mountain Forests and identify the benefits and their receivers
- To discuss, share, and update the existing practices and options for getting payment of ecosystem services around the world
- To identify possible mechanisms and policy instruments applicable to Nepal and India

August 21, 2006

Arrival of the participants to Delhi

Logistics briefing

August 22, 2006

09:30 – 10:00	Registration, welcome, and introduction
10:00 – 10:20 ANSAB)	Workshop objectives and highlights (Dr. Bishma P. Subedi,
10:20 – 11:00	Workshop remarks <ul style="list-style-type: none">• Government, Donor and Scientist representatives
11:00 – 11:45	Global perspectives and initiatives on ecosystem services (Prof. SP Singh, FNA, Vice Chancellor, Garwal University)
11:45	Tea and Coffee
12:00 – 12:30	Clarifications and discussion on Prof. Singh's presentation

12:30 - 13:15 Valuation of recreational (and soil fertility) services of Nepal and Uttranchal Mountains (Dr. Vinish Kathuria, Madras School of Economics) - presentation and discussion

13:15 - 14:15 Lunch Breaks

14:15 - 17:00 Sharing, updates, and discussions of similar initiatives by different organizations and stakeholders in Nepal and India (plenary sharing in an informal setting) - GBP Institute of Himalayan Environment and Development, Almora; Winrock International, Nepal; MAPPA/ICI MOD; IUCN, Nepal; Department of Forests, Nepal; Department of Plant Resources, Nepal; Ministry of Forests and Soil Conservation, Nepal; FECOFUN/Nepal; USAID/Nepal, ICI MOD; Uttaranchal Government; CHEA Nainital; Kumaun University, Nainital; Dr. Rajesh Thadani, Delhi; Dr. Sanjeev Vashudevan, Delhi; Dr. Ankila, Delhi.

(15:30 - 15:45 Tea and Coffee)

17:00 - 17:15 Wrap-up of the day

August 23, 2006

09:30 - 09:45 Reflection of the day 1

09:45 - 12:30 Group works - identify possible mechanisms and policy instruments applicable to Nepal and India (2 groups)

(11:00 - 11:15 Tea and Coffee)

12:30 - 13:15 Group presentations, clarifications, and plenary discussions

13:15 - 14:15 Lunch Breaks

14:15 - 15:30 Ways to move forward, action planning, commitment, and closing of the workshop

Annex 2: Workshop participants

Name	Position	Organization
Mr. Sarad Rai	Director General	Department of Forests, Nepal
Prof. Dr. S.P. Singh	Vice Chancellor	Garhwal University, India
Mr. Vijay Sardana	Chairperson	Society for Protection of Wasteland, India
Mr. Shyam K. Upadhyaya	Environmental Specialist	Winrock International, Nepal
Dr. Bijnan Acharya	Program Development Specialist	USAID, Kathmandu, Nepal
Mr. Ananda P. Pokharel	Member of Parliament	Government of Nepal
Mr. Bhim P. Shrestha	Chairperson	FECOFUN, Kathmandu, Nepal
Dr. L. M. S. Palni	Senior Advisor	Uttaranchal Government, India
Mr. Hari K. Sainju	Director General	Department of Plant Resources, Nepal
Dr. Keshav R. Kanel	Deputy Director General	Department of Forests, Nepal
Dr. Bishma P. Subedi	Executive Director	ANSAB, Kathmandu, Nepal
Dr. Sanjeev Vasudev	Ecologist	STADD, New Delhi, India
Dr. Girish Negi	Ecologist	GBP Institute of Himalayan Environment and Development, Almora, India
Dr. D.C. Uprety	Agriculture Scientist	Indian Agriculture Research Institute (IARI), New Delhi, India
Mr. Indu Bikal Sapkota	Manager - Community Forestry Program	ANSAB, Kathmandu, Nepal
Mr. Prabhu Budathoki	Country Representative	IUCN, Kathmandu, Nepal
Dr. Pushkin Phartyal	Ecologist	CHEA, Nainital, India
Dr. R.B.S. Rawat	Regional Coordinator	ICI MOD/MAPPA, Kathmandu
Dr. Rajesh Thadani	Forest Ecologist	New Delhi, India
Mr. Surya B. Binayee	Program Manager	ANSAB, Kathmandu, Nepal
Dr. Vinish Kathuria	Environmental Economist	Madras School of Economics, India
Dr. Rajeev L Semwal	Ecologist	LEAD-India
Mr. Mukund Kamaya	Researcher	Kumaun University, Nainital, India
Mr. Tika Ram Pantha	Finance Manager	ANSAB, Kathmandu, Nepal
Mr. Prakash Katwal	Enterprise Officer	ANSAB, Kathmandu, Nepal

Annex 3: A synthesis on recent practices and developments on the valuation and payments of ecosystem services

- Dr. Bhishma P. Subedi and Indu Bikal Sapkota

Deforestation in the Tropics is one of the growing environmental problems, which has global ramifications. Forests are home to about 80% of the global biodiversity and have similar proportions of biomass and carbon-stock (C-stock). Degradation of forests has been a serious problem in many areas of developing countries including Nepal and India for the last several decades. The decision makers of Nepal and Uttaranchal State of India have tried to address this problem by imposing a ban on green tree felling for commercial purposes, and more recently, by recognizing the role of local communities to some extent in forest management. The search for an alternative commercial activity in the given circumstances led to growth of micro-enterprises dependent on non-timber forest products (NTFPs, such as seeds, leaves, resin from tree and medicinal herbs, oils), wherein only parts of individual tree are harvested. Biodiversity Conservation Network (BCN), a Washington based organization, launched projects in several regions of Southeast Asia and Pacific seeking union between biodiversity conservation and enterprise development based on sustainable harvest of NTFPs. Sustainable harvest is included among the various requirements for developing schemes of certification in green marketing. However, given the population pressure, poverty and dependence of the people in mountains on forest biomass for subsistence living (collection of firewood, fodder, leaf litter and others) the pressure on the forest continues albeit in a different form, and would continue till the income generated by the NTFPs-enterprises not only raises the economic level much beyond the subsistence level but also benefits a large proportion of the population.

Forests are not only for timber and non-timber products, but also for a number of ecosystem services. The ecosystem services are defined here as services generated as a result of interactions between abiotic and biotic components of various ecosystems (Singh 2002). These services include carbon-sequestration, improvement of soil fertility, purification of soil and air, control over climate and others, and consist of flows of materials, energy and information from natural capital stocks that include various forms such as trees, soil, the atmosphere and others. Some of these services would be required to deal with the problems of the climatic change which is real, and its causal connection to the rise in greenhouse emissions is now well established (King 2004).

The ecosystem services are difficult to value because of several uncertainties, but any valuation exercise is better than no valuation. Most of the ecosystem services accrue directly to humans without passing through the money economy, and are generally in a form of public goods in nature. Costanza *et al* (1997), while doing an exercise at global level have shown that the total value of ecosystem services is about twice as much as global GNP. This observation stresses that there is a need for expanding the scope of these services at regional level by considering various forest types differing in properties and developing a management plan based on them.

The main forests ESs that have been generally considered for payments

Ecosystem Services	Remarks
Carbon sequestration	Forest, trees and soil can store carbon on a long-term basis. This represents a major global service. The boreal forests of world alone contain more carbon in their soil than the total atmospheric carbon. Carbon sequestration through afforestation and reforestation is eligible for international carbon trade under Kyoto protocol.
Biodiversity Conservation	Biodiversity conservation, both of wild and domesticated plants and animals. The entities of biodiversity generally include ecosystem, species, and populations. Biodiversity is required both for goods such as food, fibre, and genes for gene products, and services. With the loss species ecosystem processes are adversely affected. Biodiversity services are global and are of inter-generational nature.
Watershed protection	<ul style="list-style-type: none"> • Regulation of water flow – the maintenance of dry season flows and flood control. • Maintenance of water quality – minimisation of sediment load, nutrient load, chemical load and salinity. • Control of soil erosion and sedimentation. • Maintenance of aquatic habitats – e.g. reduction of water temperature through shading rivers or streams, ensuring adequate woody debris and habitat for aquatic species.
Other Services	<ul style="list-style-type: none"> • Recreational use and contribution to scenic beauty – being effectively and widely sold through ecotourism enterprises, park entrance fees, and residential property markets. • Soil formation and generation of fertility – downstream movement, creation of fertile plains by Mountain Rivers. The Gangetic plain of India has been nursed by the Himalayan Rivers since time immorial. • Climatic stability. • Pollination of crops. Forests by promoting populations of pollinators contribute to productivity of several agronomic and horticultural crops. • Colonisation of bare sites and succession – a kind of plantation work. There are number of tree species which serve by colonising the bare sites resulting from disturbances such as landslides, fire, storms, depositions of silt by rivers, and tree cutting. <i>Alnus nepalensis</i>, <i>Dalbergia sissoo</i>, <i>Acacia catechu</i>, <i>Populus ciliata</i> are some of the common colonizers. This process can not occur without the presence of first stands nearby the newly created bare and damaged sites.

Moreover, the forests of Himalaya mountains of Nepal and Uttranchal India supply ecosystem services to most of the Gangetic Plains (GP) which is undoubtedly one of the most productive/fertile and populated regions of the world. It is but obvious that any impairment of the forest ecosystem services of the Himalaya Mountains is going to affect the life of over 500 million people living in the adjacent river basin. Somehow, we have taken for granted the flow of ecosystem services from these mountains to GP and seldom appreciate the intimate relationship between the health of forests of these mountains and the population supporting capacity of GP.

However, the threat to these mountain forests continues to be high largely because of poverty of the people and lack of any alternative strategies for development. Forest stands in general, have a lower biomass and productivity than their potentials (Singh & Singh 1992), many species are failing to regenerate (e.g., *Quercus semecarpifolia*) and several forest stands consist of denuded trees because of excessive lopping for firewood and fodder. Overgrazing by domestic animals without concern for regeneration of forest growth, inappropriate harvesting practice for extraction of biomass to meet the day-to-day needs of firewood and fodder, frequent fires, poaching of wild animals and the spread of invasive/exotic plant species are some of the observations indicating that the forests are not healthy and liable to deteriorate further. Since more than 80% of the people depend on the forest biomass for day-to-day living in the Himalaya Mountains, (Singh and Singh 1992) the biomass removal from forests is substantial and widespread, and the scope for further biomass extraction for developing NTFPs-based enterprise is limited. NTFPs-based enterprises can involve only a small proportion of the state's population, and can generate only a limited amount of money, certainly not enough to replace the subsistence living with concomitant easing of pressure on forests. Obviously, the people do not have enough capacity and incentives to conserve forests on their own.

The market-based mechanism that involves ecosystem services is still in its initial stage of development. At present it is in place at a few thousand sites in the world. Getting payment from a standing forest represents a major advancement in conservation. All these years forest managers have remained glued to working out the sustainable harvest rate of forests, whereas getting payments for forest ecosystem services represents making money without extracting forest biomass. This approach of conservation is different from the one based on "polluter pays principle", which says that those who pollute environment should bear the costs. For example, owners of factories which dump their

Payment for carbon sequestration by forests

Concerns over global warming have led to the possibility of selling carbon-sequestration services of forest ecosystem in international market. To be eligible to participate in carbon trading, forestry interventions or projects will be required to monitor carbon stock over time, and to get the estimates certified. One needs to develop simple but reliable and valid methods to measure carbon sequestration. Carbon trade through forestry had been initiated, before the Kyoto Protocol became operational. For example, in the Scolel Te' project in southern Mexico farmer's communities are selling carbon at US \$12 per t C. With Russia signing the protocol in February 2004, there is a worldwide enthusiasm that carbon sequestration is going to be the first major international environmental services to be traded in international market. However, only afforestation and reforestation activities are eligible for payment under the Kyoto Protocol, and forestry accounts for only a small fraction of project under the clean development mechanism (CDM), most projects approved concern with energy and industrial activities.

effluents in rivers should bear the costs of treating water and restoring rivers. The costs, however, are passed on to consumers of goods in the form of their increased prices. The ecosystem service-oriented approach holds that those who provide an environmental benefit should be rewarded for doing so, and this can be referred to as "provider gets principle" (Pagiola *et al* 2002). Failure of its application is one of the principal causes of ecosystem degradation and loss of ecosystem services.

From the above descriptions, examples, and analysis, it is clear that there is a need to consider valuation of forest ecosystem services and incorporate them into accounting at national, regional, and other levels to fully appreciate the forest ecosystem services of the Himalayan Mountains which contribute significantly to the life supporting capacity of both in the mountains and adjacent plains. This is important so as to provide enough incentives to local communities for forest conservation in the Himalayas. In this context, a regional meeting was organized involving key stakeholders and relevant organizations from India and Nepal to discuss and explore the scope of valuation and options for payment of ecosystem services of mountain forests to mountain local communities. The specific objectives were:

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Thank you.