

# **STAKEHOLDER ENGAGEMENT IN THE ESPA SITUATION ANALYSIS FOR THE 'INDIA AND THE HINDUKUSH' REGION – A NOTE**

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## **1. Need for stakeholder engagement in the ESPA Situation Analysis (ESPASA) project**

- 1.1 Interactions between ecosystems and human societies typically involve multiple actors with varied stakes. Ecosystems tend to cut across socio-economic, cultural and political boundaries thereby bringing in stakeholders at different levels, ranging from the local to the regional. Further, ecosystem services cater to multiple needs that range from the local to the global and this adds to the plurality of stakeholder interests. An understanding of the behavioral drivers behind ecosystem-related trends would be incomplete without a comprehensive identification of all the important stakeholders, their varied interests, and their influences over each other as well as the ecosystem itself.
- 1.2 Conflicts and tradeoffs are inherent to the use of ecosystem services. While conflicts arise out of competition between different stakeholder groups over similar ecosystem uses, tradeoffs refer to choice amongst conflicting ecosystem uses by single stakeholder groups.
- 1.3 The non-rival nature of ecosystem uses is often associated with externalities (positive/negative) that have livelihood-related consequences for stakeholder groups over space and time.
- 1.4 Institutional arrangements for ecosystem management tend to be influenced by dominant stakeholders whose power may be on account of higher social status, greater buying power, or better political representation. Policy failures in poverty alleviation are often linked to weak/ineffective institutions and any analysis of the former would need to examine the entire socio-economic and political milieu that defines the roles different stakeholders play in a given ecosystem context.

Stakeholder involvement in the ESPA project is expected to contribute to the situation analysis by: (a) enabling relevant data and information sources within the region to be identified and made available for the study; (b) providing stakeholders the opportunity to input to the situation analysis on a continuous basis throughout the study period; (c) supporting a participatory assessment of information and knowledge needs leading to the identification of appropriate capacity-creation mechanisms; (d) ground-truthing the accuracy of the information being collected and the insights being inferred in the study; and (e) increasing the acceptability of the study's findings and thereby making it relevant for policymaking.

## **2. Stakeholder categories in the context of the ESPA project**

Stakeholders are "groups of people with common objectives and sets of interests with regard to the resource in question and the environment" (Grimble and Chan, 1995) who are either materially effected by, or who can materially effect developments designed to bring about a particular transformation (Oglethorpe, 2002). Going by this definition, the stakeholder groups relevant to the ESPA project may be broadly categorized as follows:

- 2.1 Development policy makers and planners**, because they are mandated to formulate, monitor and redesign national/sub-national/ sectoral plans and programmes aimed at conservation and poverty reduction. For example, in the Indian case, this category would include the Ministry of Environment and Forests, the Ministry of Rural Development, the Ministry of Tribal Welfare, Planning Commission, etc.



**2.2 Ecosystem managers**, because they function as the regulators of human activity in ecosystems and bear the responsibility for the latter's maintenance and 'health'. Again, in the case of India, there are bodies such as the Chilika Development Authority, which act as ecosystem regulators. Similarly, the JFM institutions have the responsibility to conserve and sustainably use forest ecosystems. Pani Panchayats and WUAs (Water User Associations) perform a similar role in the case of water resources.

**2.3 Resource users**, because they materially benefit from the services provided by ecosystems and any change in such flows is of immediate relevance for their well-being. E.g. fishermen cooperatives, NTFP cooperatives, WUAs, etc.

**2.4 Research and academia**, because they generate as well as disseminate knowledge relating to ecosystems, and provide insights that are relevant for policymaking. This category includes both public and private universities, research institutes and think-tanks, as well as individual subject experts.

**2.5 Civil Society Organizations**, because they serve as the link between resource users and the other important stakeholders, provide awareness and advocacy functions, and often participate in the implementation of the plans/programmes of the government and donor agencies. This category would include not only the national and international NGOs concerned with poverty reduction, sustainable development and ecosystem conservation, but also the community associations that are often at the forefront of social movements linked to ecological conservation and development issues (e.g. the Narmada Bachao Andolan, the Chipko Movement, etc). Apart from this, local opinion leaders who have knowledge, experience and influence in their individual capacity are also included.

**2.6 Media**, because of its capacity to highlight needs, influence policy, raise awareness and interest.

**2.7 Donors**, because they provide resources for the design and implementation of conservation and development projects.

**2.8 Corporate sector**, because they are part of market-based arrangements in the use of ecosystem services.

### **3. Stakeholder engagement mechanisms used by the ESPASSA consortium**

Stakeholder engagement in the ESPA study for the 'India and the Hindukush' region is based on the use of mass media (press releases and television interviews), organization-level networks (distribution of leaflets), the internet (a dedicated project website), and national-level stakeholder workshops in each of the five countries belonging to the region. While the first two components are intended to spread information among stakeholders about the project, the latter two are expected primarily to serve as the mechanisms through which stakeholders would be able to directly input to the study. However, compared to the internet-based mechanism for gathering stakeholder inputs, the country workshops would be more focused, and structured to generate the required information from the participating stakeholder representatives.

### **4. Expected outcomes from the country workshops**

The country workshops are intended to contribute to the study by bringing together a focus group of stakeholder representatives for discussion on the following key issues:

4.1 What are ecosystem services and how do they contribute to poverty alleviation?



- 4.2 What are the trends in the state of ecosystems and how has this affected the availability of different ecosystem services over time and across space?
- 4.3 What are the major drivers (direct and indirect) to account for the changing availability of ecosystem services over time and across space? How have global-level drivers contributed to local-level changes in the availability of ecosystem services? Which are the policy-related drivers that have turned out to be most influential at different ecosystem scales?
- 4.4 What has been the impact of the changing availability of ecosystem services on the poor and how has the latter coped?
- 4.5 What has been the policy response to changing availability of ecosystem services and to what extent it has been effective in addressing the poverty-related consequences of such changes?

Discussion on the above issues is expected to help the project team in understanding varying perceptions amongst stakeholders on different aspects of the poverty-ecosystem relationship. This, in turn, will lead to the identification of potential sources of conflicts and possible areas of consensus in stakeholder interactions over ecosystem uses. From the policy perspective, such knowledge would be of high value in the design of institutional arrangements for ecosystem management.

A related outcome of the country workshops would be the needs assessment for different stakeholder groups with respect to ecosystem management, specifically for poverty alleviation purpose. In this participatory approach to needs assessment, each stakeholder group is expected to identify its approach to ecosystem management (for poverty alleviation), its own role therein, the capabilities that would be required, and possible mechanisms for capacity-building.

## **5. Workshop methods**

There is a need for at least 3-4 participants from each stakeholder category. Experience, articulation, and the ability to represent would constitute the criteria for choice of individual participants. Each participant must be informed beforehand of the project background, the key issues being examined in the study, and the expected outcomes from the workshop. Moreover, the participants need to be encouraged to bring with them specific case studies from their own experience that are relevant to the key issues and which can be shared with other participants in the workshop. It may help to identify individuals from each stakeholder category to act as facilitators/lead discussants/moderators in the workshop discussions and inform them in advance of their respective roles.

The workshop can start with a presentation from the project team on the project background and its deliverables, key issues, concepts and frameworks, and workshop objectives. It is essential that the workshop starts by developing a common understanding among the participants on these aspects.

The discussion sessions to follow can be structured around the following activities:

**5.1 Activity 1:** Representatives of the same stakeholder category can be grouped together to choose a particular ecosystem of common knowledge and answer the following questions:

What is your stake or 'interest' in the ecosystem?

Who according to you may be the other stakeholders in the chosen ecosystem?  
(Please rank in order of importance) What interests would they have in the ecosystem, according to you?

The outcome of the activity will be in the following matrix form:



Ecosystem chosen (brief description of location, scale, importance, etc):	
Stakeholders (in descending order of importance)	Interests

(45 minutes)

**5.2 Activity 2:** Representatives of the same stakeholder category can be grouped together to discuss the importance of ecosystem services to human well-being.

Each group maps the different MEA categories of ecosystem services onto the various aspects of human well-being identified in the same framework and gives a score to each link from a common scale. An Excel-worksheet can be used for the mapping exercise with the ecosystem services appearing as row headings and well-being aspects as column headings. The cells can then be filled with specific examples from real-life instances covering different ecosystems accompanied by the perceived importance score. (45 minutes)

**5.3 Activity 3:** Representatives of different stakeholder categories are grouped together and asked to pool their knowledge of specific ecosystems in their own countries and identify the drivers behind changes in the state of such ecosystems. A key part of the exercise will be to trace the impact pathways – from drivers to specific changes in ecosystem services. The outcome of the exercise would be in the following matrix form:

Ecosystem (brief description)	'Drivers' behind changes in the availability of specific ecosystem services over time	Impact pathway (driver – changes in institutional arrangements or behavioral incentives – impact on ecosystem services)

(1 hour)

**5.4 Activity 4:** The groups formed for Activity 3 meet again to discuss the policy responses and coping strategies of the poor to changes in the availability of ecosystem services already identified.

(1 hour)



**5.5 Activity 5:** Representatives of the same stakeholder category can be grouped together to present their approach to ecosystem management, explain their role, identify needs, and suggest appropriate capacity-building mechanisms.

(1 hour)

Important: It will greatly help the SA if the discussion sessions are audio-recorded and later transcribed in detail in the proceedings document.



**Ecosystem Services and Poverty Alleviation Study in South Asia  
Bangladesh Workshop Report**

BRAC<sup>1</sup>

January 2008

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<sup>1</sup> Moushumi Chaudhury wrote the workshop report. She is thankful for important comments from Dr. Mahabub Hossain, input from Kazi Faisal Bin Siraj, and Maliha Muzammil and Nusrat Awwal for preparing the transcripts.



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## Introduction

The Workshop on Ecosystem Services and Poverty Alleviation Study in South Asia (ESPASSA) for Bangladesh was held on 17 December 2007 at BRAC Centre. The workshop was organized by BRAC in association with World Conservation Union (IUCN) Bangladesh country office<sup>2</sup>. The objectives of the workshop were:

- a) To have a critical review of the draft situation analysis (SA) that has been prepared based on the review of available literature
- b) To gather further information on drivers of change in ecosystem services and its effect on livelihoods of poor people that are not available in published or gray literature, but development practitioners know from their experience from implementing various projects and
- c) To identify knowledge gaps to build greater linkages between ecosystem services and poverty alleviation.

Several distinguished experts attended the workshop representing research from academic institutes, policy makers and civil society groups. In total, 43 experts attended the workshop (see Annex 1 for description of participants). These experts were identified through a stakeholder analysis carried out prior to the workshop that included a focus group discussion with prominent figures in the field of poverty and environment. Section 2 describes the stakeholder engagement methodology used to stimulate conversations in the workshop. Section 3 provides a summary of key information stated by participants during the workshop that can help build the SA.

## 2. Stakeholder Engagement Methodology

Experts for the workshop were identified based on the knowledge and experience they could provide to help build up the SA. Therefore, attempts were made to ensure that participants invited would be able to comment on at least one type of ecosystem and topics in relation to ecosystem services and poverty alleviation. The SA was based on a literature review of various ecosystems, their services, and how they link to poverty. The literature was found through online databases and in libraries hosted in various development agencies and research organizations. It was assumed that the literature and documents missed in the draft SA would be suggested during the workshop when experts reflect on the SA and provide information and comments on the knowledge that already exists.

The workshop was divided into two major sessions in addition to the introductory session mentioned earlier (see Annex 1 on the program of the workshop). The first session focused on discussions on the characteristics of major ecosystems and the drivers of change in ecosystem services. The ecosystems included are coastal forest, inland water, agro-ecosystems, and hills and uplands. An expert highly knowledgeable of the specific ecosystem was identified in consultation of the IUCN office in Dhaka and was requested to lead the discussion in the Workshop (see Annex 2 for list of participants). The chair of this session, Dr. Ainun Nishat, the Country Representative of IUCN Bangladesh, chaired the session. He identified key issues after the presentation of the lead discussant and steered the discussion around the table on the issues. The second session focused on a) the existing knowledge on the valuation of ecosystem services, b) the linkage between ecosystem service and poverty, c) on policies adopted by the government to regulate the drivers to minimize adverse impact on livelihoods, and d) on the success and failures of implementation of the policies. Again a lead discussant was identified earlier on each of

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<sup>2</sup> The project sponsors were NERC, ESRC, and DFID-UK. The consortium partners were Teri University and TERI, India; University of Liverpool, UK; IUCN, Sri Lanka; SDPI, Pakistan; and BRAC, Bangladesh.



these topics and was requested to make a formal presentation. Dr. Mahabub Hossain, the Executive Director of BRAC, chaired this session. In addition to presentations of recent research findings, this session highlighted the importance of environment accounting and key policies that need to be adopted to integrate ecosystem services with poverty alleviation.

### **3. Summary of Workshop Proceedings**

Dr. Mahabub Hossain chaired the introductory session. The objective of the session was to brief the participants on ESPASSA project and the draft situation analysis that has already been prepared based on available literature. Kazi Faisal Bin Seraj made a brief presentation of the project followed by a detailed presentation by Dr. Moushumi Chaudhury on the draft SA (See the power-points in Annex 3 and 4 respectively). The presentations were followed by comments on the draft SA from the floor. Many commentators commended Dr. Chaudhury for her analytical and perceptive review of the literature and thought that review itself would be a good addition to the literature, as the available information remained scattered and specific to ecosystems. This is the first time that the information was put together into a comprehensive document. A few participants commented that there are many gray literatures, which have not been taken into account. The Chairperson asked the participants to give full particulars of the missing documents so they could be include when revising the SA. The gaps included a) documents on community based natural resource management, projects, and b) documents on advocacy and political economy on environmental policy making. None of the people who commented in the first session suggested any specific analytical studies so that the draft SA could be substantially improved.

*The highlights of presentations on the characteristic and drivers of various ecosystems made in the second session are as follows:*

#### *(a) Coastal Forests*

Mr. Junaid Kabir Choudhury led the discussion on Coastal Forests. He provided an overview of the various types of forest areas, including mangrove forests as part of coastal forest systems. He mentioned the gradual erosion of biodiversity of species over time. The stock of various types of trees has fallen from 296 species in 1959 to 180 in 1983, and further to 144 in 1994. The drastic fall in the number of tree species was seen particularly in the Chakaria Sundarbans where 18,500 acres of land was declared reserved forests in 1993, and 2,520 acres as protected. However, conversion of land to shrimp aquaculture devastated the coastal forest area and led to the destruction of the ecosystem. Attempts were made to recreate the forest area through afforestation. However, the success was limited because people are more interested in highly profitable shrimp farming. The expansion of the shrimp farming has made the people in coastal areas more vulnerable during cyclones, since coastal mangroves provided protection against storms. Mr. Choudhury also identified several other problems coastal forests face. They include issues of land tenure as influential shrimp entrepreneurs has forcibly rented land from small and marginal land owners for making fish ponds, gradual salinization of land and disappearance of social forests, and depletion of livestock due to disappearance of grazing land and scarcity of fodder such as rice straws. He ended his presentation by stating that policies for conservation of mangrove forests must be strengthened to protect the livelihoods of the inhabitants of coastal areas.

Mr. Choudhury's presentation raised interesting debates on the accuracy of available statistics on forest areas and deforestation, and on social forestry, which has developed substantially in recent years in the coastal belt. It was mentioned that the government of Bangladesh measures forest areas based on land area under forests registered in the land records available in the government registers (2.52 million hectares), whereas the United



Nations Food and Agriculture Organization measures forest areas based on ground cover by trees received from satellite images (1.61 million hectares). The misleading government statistics have had negative impact on policymaking as it downplayed the need for the protection of the forest ecosystem. There were additional debates on whether social forestry actually provided benefits in terms of protecting and sustainably using ecosystem services to reduce poverty among forest dependent people. The shallow root system of trees planted around the homestead got uprooted during the most recent cyclone that hit the southwestern coast on November 15, 2007 and was the cause for a substantial number of deaths inland. Some participants suggested that it was better to leave primary forests undisturbed instead of converting them to plantations with foreign species under social forestry management schemes. It is necessary to introduce regulations and/or promote community forestry. This debate was raised again in the sessions on hills and *sal* forest ecosystems.

Another issue raised in the discussion is the lack of understanding by the regulatory agencies of the political economy behind the use of natural resources that affect poor people. For instance, it was urged that shrimp farming in the Chakaria Sundarbans be understood through a political economy lens that reflects interests of powerful agents (i.e. government officials) and how they lease land for shrimp farming only for profit, and without consideration of environmental factors. It was also pointed out that there are conflicting policies that aim to promote agricultural growth that takes precedence over the conservation of natural resources in the coast.

#### *(b) Inland Water/Flood-plains*

Inamul Haque, Director General of WARPO made the presentation of the characteristics and drivers of the Inland Water/ Flood-plain ecosystem. In his presentation, he gave an overview of the various inland water bodies that exist in Bangladesh as well as information on volume of water, rainfall, and the various ways in which people in different geographical settings in Bangladesh depend on water. Mr. Haque also pointed out major drivers of change as floods, river erosion, and waterlogging which impacts on agricultural production, disinvestments on land, loss of human settlement, lack of safe drinking water, and outbreak of water borne diseases. The presentation also related water to navigation, fishery, and protection of migratory birds and biodiversity. The presentation highlighted concerns on siltation of water bodies, drying rivers due to pollution and extraction of soil for brick making, filling of lowlands for house construction. He ended by stating that water is a basic human right that needs to be respected by enacting strong water laws that maintain water security.

Due to long presentation, there was not enough time for discussion on the topic. The limited discussion focused on two additional points. First, the construction of embankments for the large-scale flood-protection and irrigation projects inhibited the flow of fish fingerlings. It contributed to reduction in fish supply in the open-water bodies and had adverse effects on the livelihoods of fishermen water fisheries. Second, the construction of earthen roads in the seventies and eighties under food-for-works programme blocked many natural drainage channels. These earthen roads were later converted into paved roads. These roads now cause drainage congestion during flooding leading to duration and intensity of flooding in certain areas.

#### *(c) Agro-ecosystems*

Dr. M. Asaduzamman, Research Director of the Bangladesh Institute of Development Studies (BIDS) made the presentation on the agro-ecosystem (see Dr. Asaduzaman's case study on agro-ecosystem in Annex 5). At the outset, he clarified that the agro-ecosystem is not a natural but a man-made managed system where various types of land and water interacted. He also stressed that agro-ecosystems vary greatly in different parts of Bangladesh because of the various types of soil, landform and rainfall patterns. He



highlighted several drivers of change that can prevent cultivation of crops such as rice. Climate change and global warming is a key driver since it affects rainfall that refills both surface and groundwater sources used in agriculture. Silting up of rivers and canals is also a major driver that has affected the ecosystem. It led to reduction in the availability of surface water for irrigation and induced people to over-exploit the ground water resources.

Dr Asaduzzaman mentioned that the biggest driver of all that affected the agro-ecosystems is the population growth. The population in 1971 was 70 million. It has now grown to 140 million. This has led to high demand for food through intensive use of agricultural land and water. Although the rate of population growth has declined from 3.0 percent per year at independence in 1970 to 1.4 per cent per year at present, the absolute number is still increasing by 2.0 million every year with the country requiring to produce an additional 0.5 million tons of rice every year. The country had to take up high-yielding varieties of rice and wheat to feed the growing population and the modern varieties have now spread to two-thirds of the area under cereals. Dr. Asaduzamman, however, stated that it was the policy to subsidize chemical fertilizers and pesticides that contributed to the deterioration of the agro-ecosystem. The government has maintained the price of urea at a very low level, but has allowed the private sector to import phosphate and potash and charge the international prices to farmers. As a result, the farmers use too much urea and too little other fertilizers, and the un-balanced use of fertilizer has contributed to the deterioration of soil fertility. There are other, technological advancements such as hydroponics where crops can be grown without much land but that has not been thoroughly investigated as a major option in Bangladesh. Crop diversification has also not been seriously considered in Bangladesh to enhance food security. Research is needed on how changing socio-economic conditions have affected marginal farmers and tenants (who own less than 10 decimals of land) its impact on the supply of food and how they indirectly affect poor people through prices.

The discussion from the floor raised the issue on the effect of exploitation of ground water resources for irrigation of the supply of safe drinking water and the arsenic contamination of water, which has become a major health issue in Bangladesh. A lively debate also followed on whether Bangladesh should go for hybrid rice and biotechnology in view of the extremely land scarcity. Participants of the workshop took extreme positions on this issue.

#### *(d) Hill and Sal Forests*

Mr. Philip Gain's opening presentation was critical of forest conversion into human habitat, factories, plantations and social forestry in Chittagong Hill Tracts and Madhupur Forest. He believes the de-forestation for the so-called "development activities" was for the benefit of only international development organizations. Rubber plantations promoted by development organizations such as the Asian Development Bank, for instance, is a 'monoculture' that provides very little ecosystem services or support for local people. He strongly believes the poverty reduction strategies in Bangladesh are 'myopic' and donor interests are fickle and unreliable. Therefore, national policies need to be 'country-driven' and not dictated by international financing bodies.

#### *(e) Open Discussions on Ecosystem Services*

The key observation and policy implications that came out from the open discussion on trends in ecosystem services are presented in Table 1.



**Table 1: Discussion on Ecosystems**

<b>Ecosystems / Topics</b>	<b>Observations/ recommendations</b>
<b>Coastal Forests</b>	<ul style="list-style-type: none"> <li>Sanctuaries should be created in wetlands to protect biodiversity and enhance services</li> </ul>
<b>Inland Water</b>	<ul style="list-style-type: none"> <li>The concept of environmental impact assessments was not used until 2000, and therefore, the impact of flood-protection embankments on the environment was not seriously concerned since the priority was how to increase food production. However, embankments are sometimes appropriate along the coasts. The usefulness of embankments depends on the location.</li> </ul>
<b>Agro-ecosystem</b>	<ul style="list-style-type: none"> <li>There is a need to discuss farmers' rights, genetically modified organisms, and growing use of crops for producing biofuels.</li> </ul>
<b>Hill and Sal Forests</b>	<ul style="list-style-type: none"> <li>There is a need to discuss political economy of Chittagong Hill Tracts.</li> <li>Bangladesh is heading towards habitat fragmentation and creation of eco-parks. How will this be able to maintain biodiversity? The new forest policy in the Forest Outlook 2020 document still calls for archaic management systems that include harvesting timber without much concern about poverty alleviation and livelihood security of people living on forestry.</li> <li>Great care needs to be taken before introducing foreign species.</li> </ul>
<b>Additional Topics</b>	<ul style="list-style-type: none"> <li>There is a need to include local people and communities into decision making</li> </ul>
	<ul style="list-style-type: none"> <li>More scientific understanding needs to be made on ecosystem services</li> </ul>
	<ul style="list-style-type: none"> <li>Home-grown projects should be encouraged and not just donor-driven ones</li> </ul>
	<ul style="list-style-type: none"> <li>Laws need to be developed and implemented since policies cannot be enacted</li> </ul>

Based on the discussions on the various on ecosystem services in the first session, Table 2 below highlights the various drivers and impacts on human well-being that were not included in the SA but were discussed in the workshop. These comments will be further incorporated into the section on research gaps and policies later in this report.



Table 2: Ecosystems, Drivers and Well-Being

Ecosystem	Drivers'	Impact on Human Well-being
<b>Coastal Forests</b>	Illegal Encroachment	Overexploitation of resources
	Land use change	Overexploitation of resources
	Conversion of paddy land into shrimp ponds	Elite shrimp farmers purposely inundate agricultural land with saline water forcing people into shrimp farming, which results in social violence and conflict. This degrades soil quality leading to the creation of 'saline deserts'.
	Development of Saltpans	Reduction of employment for the landless
<b>Inland Waters</b>	Extraction of soil for construction	This is causing more river bank erosion, erosion of soils
	Irrigation, drainage and flood-protection projects	Restrict movement of fish fingerlings, reduction in open-water fisheries
<b>Agro-ecosystem</b>	Population pressure	Over use of land, reduction in soil fertility causing reduced land productivity diversion of land to non-agricultural uses
	Climate change	Monsoon variability and more frequent incident of floods, drought and cyclone
	Appropriation of land for development purposes	Deprives poor people access to <i>khas</i> land
	Brick industries	This activity contributes to loss of top soil, which impacts food security and livelihoods of marginal farmers
	High global fuel costs	High cost of fuels on the global market makes it difficult for poor farmers to produce, transport, and sell products
	Blocking river systems	It reduces the amount of water that can be used for irrigation, and thereby, reduces crop production. This affects economic well-being and food security. Reduces flow of drainage during floods increases duration and intensity of flooding.

The topics discussed in this session also highlighted several knowledge gaps, which are presented below in Table 2. Although several gaps were identified, the table below also demonstrates that participants did not suggest how these gaps should be filled, what capacities to develop to fill the gaps, and how filling in these gaps will contribute to policies to alleviate poverty.



**Table 3: Knowledge Gaps**

<b>Ecosystem</b>	<b>Knowledge Gaps</b>
<b>Coastal Forests</b>	Unreliable data on forest area and ecological accounting affects informed policy making
<b>Agro-ecosystems</b>	The potentials of using hydroponics to reduce impact on land for food production
	Potentials of crop diversification to enhance food security
	Impact of changing socio-economic conditions on tenant and marginal farmers
	Impact of rising prices on the supply of food and how they indirectly affect poor people
	Potential of granting farmers' rights, and use of genetically modified organisms on poverty.
<b>Hill and Sal Forests</b>	The question of whether destruction of natural forests to implement social forestry and plantations (of foreign species) for larger production will alleviate poverty should be examined. It should also be investigated if natural forests provide greater ecosystem services compared to social forestry.
	There is a need to assess the political economy of Chittagong Hill Tracts
<b>In General</b>	Need scientific understanding of various ecosystem services, particularly focusing on changes in chemical composition, sediment loads, and microclimate information to know what should be conserved and used for poverty alleviation.
	Research is required on the political economy of natural resources to understand markets and potential for employment generation
	Impact of biofuels on food prices and poverty as well as the state of energy reserves in relation to poverty alleviation.

*(f) Poverty, Environmental Accounting, and Policy Recommendations*

The final session of the workshop focused more strongly on linking poverty with ecosystems services, the importance of environmental accounting as a policy-making tool, and policy recommendations. Dr. Mahabub Hossain chaired this session. Below are summaries of the sub-sessions.

The first discussant in this final session was Dr. Atiur Rahman, Professor, Department of Development Studies, Dhaka University. Dr. Rahman started by defining ecosystems, which he stated as systems, where both 'the living... [and] non-living... species and organism constantly engage in a set of relationships...constituting the environment in which they exist'. He then reflected on the recent Cyclone Sidr that occurred in Bangladesh in November 2007. He provided an example of how many people are dependent on the Sundarbans that have been damaged due to the Cyclone for their livelihoods. If alternative access to resources were available, the poor's dependency on one ecosystem would have decreased, which would also allow the Sundarbans to regenerate. Dr. Rahman also highlighted how the poor, especially women and children are vulnerable. They are especially vulnerable to natural disasters, such as floods and droughts, and diseases due to poor hygiene conditions. The poor in general are highly dependent on common property resources, such as forests, and rivers, canals and ponds compared to the rich. They also have very little ability to cope with natural disasters like floods and cyclones. Dr. Rahman reflected on the impact of shrimp farming on the ecosystem and people. He described this economic activity as creating 'islands of capitalist penetration where local labour cannot get that many job opportunities' because the salinity that is caused by shrimp farming destroys the ecosystem. He also



reflected on how riverbank erosion in rural areas is leading to exacerbation of urban poverty since many who are displaced go to Dhaka to search for alternative employment. He described it as a ‘silent disaster’ that has serious long-term impact on the socioeconomic conditions of the poor. He also commented on the problems of arsenic contamination of ground water that has reduced the access to safe drinking water in Bangladesh in recent years, and the impact of population growth that has reduced fishing in *haor* areas<sup>3</sup>. These issues have primarily affected poor people. He also highlighted the impact of soil degradation due to high use of fertilizers and pesticides, as well as industrial pollution. On a positive note, due to increasing cost of chemical fertilizers, poor farmers are again investing in economic and environmental friendly agriculture technologies as an alternative. He provided an example of Pyraban village where people have switched to more environmentally sensitive farming methods that rely on compost for fertilizer.

Dr. Rahman concluded his presentation by stating that a move to more suitable and adaptive intervention strategies that embraces, understands and respects the complexity of the ecosystems is needed... We should not try to increase one ecosystem’s productivity by trying to match it to [another]... we should remember that not all ecosystems are the same. We should keep in mind the multi dimensional sources of poverty; including degrading ecosystems while designing anti- poverty policy strategies. There is a need for policy coherence at the government level. Intervention strategies need to take into account the temporal dynamics underlying ecosystems. Intervention strategies should be designed in away that they respect different degrees and types of the use of ecosystem services so that no groups are marginalized in the process.

Dr. Mustain Billah was the next lead discussant in the sub-session. Considering Dr. Billah wanted to avoid overlaps with what has already been said in the workshop thus far, he focused on providing policy recommendations. He suggested that small and medium agriculture enterprises based on identified agro-ecological zones, should be promoted because they are more able to balance reducing poverty while preventing soil degradation. Planting of alien species should also be minimized. There may also be potential to develop non-timber forest products as a source of income, especially for the poor. He also called for enhancing people’s participation in managing natural resources through defined property rights, which will promote social equity. This would also require local government offices to be involved. Since policies have not been updated since colonialism, policies need to be re-visited, and which needs to include scientific understanding of ecosystem services while avoiding conflicting recommendations between different sectors (i.e. forestry versus fisheries).

Dr. Billah also called for using assessment tools such as Cost Benefit Analysis and environmental accounting before development projects begin, especially on fragile wetland areas. Environmental Impact Assessment as a tool needs to be rigorously used to prevent environmentally damaging development activities. Ecological zones such as, Ecological Critically Areas needed to be cared for and zones needs to created for marine ecosystems. Finally, international policies need to be incorporated into national policies in Bangladesh. For instance, Agenda 21, Poverty Reduction Strategy Paper, and Millennium Development Goals need to be included appropriately in policies to reflect global policy trends.

The final lead discussant in the workshop was Dr. Enamul Haque. Dr. Haque started his presentation by giving an example of the economic value of the Sundarbans, a World Heritage Site. He suggested that global value of such a site needs to be incorporated in valuation and policies. However, placing a value on resources does not necessarily mean a place will be conserved. Economic valuation is only a tool for placing economic value. By

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<sup>3</sup> *Haors* are backwater swamp or bowl-shaped depression located between the natural levees of rivers.



providing examples of community forestry in Nepal and Joint Forest Management in India, Dr. Haque stated that research needs to be conducted to see what rules and community-based organizations enhance conservation and alleviate poverty. Therefore, conducting research beyond how to place economic value on goods and services, is key to understanding what works, and it prevents false assumptions and poor policies. He suggested that, 'we should not decide on why we should protect them [natural resources] with the help of numbers, but rather because the benefit of protecting the particular resource is higher than the benefit losing it'. Dr. Haque also highlighted the need to compensate off-site users of ecosystem services. For instance, if a wetland in a rural area is covered and it affects services in urban areas, then people in urban areas need to be compensated. This is an issue of social justice. He ended his presentation by commenting on the Sundarbans. He stated if I was asked to find the value of the Sunderbans, I would not even go into the discussion as Sunderbans are not for sale, so I cannot find it's value. A resource I am going to protect is not something I want to give a value to... valuation in this manner is wrong and risk-prone, which may lead to policy errors.

*(g) Open Discussion on Poverty, Environmental Accounting, and Policy Recommendations*

After Dr. Haque's presentation, he entertained several questions from the floor in an open discussion. One question was: are there any market based instruments such as polluters pay principle or tradable permits that can be used to protect wetlands in Bangladesh? Dr. Haque answered by stating that before tradable permits are introduced, the level of pollution needs to be assessed to find out the total pollution load. However, a command and control model still exists in Bangladesh, which inhibits efficiency. Market based mechanisms need to be included into national policies. Another question Dr. Haque entertained was: How can people who live on riverbanks be compensated if sand from rivers is being used for construction purposes when it is needed to protect riverbank erosion? He replied by stating that more research needs to be done on this topic. He was also asked: How can environmental accounting help recover large-scale environmental degradation? He replied by giving an example of salinity in the Sundarbans caused primarily by shrimp farming, which has led to large-scale ecological disasters. He stated that research needs to be done on the level of salinity in the Sundarbans. This will help to find the exact externality and whether shrimp farming is the only reason for salinity intrusion or whether other activities contribute to salinity.

Additional comments during this open forum are highlighted below.

- There was a concern about rapid urbanization in Bangladesh and the fear of losing agricultural land to industrialization and urban sprawl. This situation begs the question of how Bangladesh will be food secure when agricultural land is rapidly being converted and what will happen to the lives and livelihoods of poor farmers who are heavily dependent on agro-ecosystems. This calls for land and industrialization policies to be complementary.
- Both the private and public sectors should rigorously conduct environmental Impact Assessments.
- Rigorous research needs to be conducted to prevent making wide, sweeping comments. Research funding bodies such as South Asia Network for Development Economics and Environment can be approached to conduct research on ecosystem evaluation in Bangladesh.
- There is a need to incorporate local knowledge when valuating ecosystems.
- The issue of compensating people for loss of ecosystem services should be part of national policies



- How is it possible to include intangible benefits into economic valuation of services? If an intangible benefit is missing from the equation, would that not lead to misleading policies?

Dr. Hossain concluded the workshop by highlighting a few key points. He stressed the need to conduct rigorous research on linking ecosystem services with poverty, especially since most of what had been discussed in the workshop was based on anecdotal evidence. There is a need to understand tradeoffs between using and conserving various ecosystems to alleviate poverty. He also suggested that ecosystem valuations need to be conducted while investigating how loss of ecosystems affects people in different types of poverty groups. Dr. Hossain particularly identified the need to capture macro-level drivers such as population change, urbanization, globalization (i.e. the impact of high cost of fuels that has led to increase in food prices and which has only allowed higher income groups to access food), technology (i.e. impact of technology to breed shrimp in freshwater and not saline water; biotechnology that reduces the level of pesticides required). Table 3 below categorizes and compiles the various policy recommendations that were discussed throughout (not only in the final session) the workshop by the participants.

**Table 4: Policy Recommendations**

<b>Ecosystems and Additional Topics</b>	<b>Policy Responses</b>
<b>Coastal Mangroves</b>	Establish a coastal greenbelt to protect against tsunamis and cyclones that not only cause environmental disasters but leaves people resource poor, affecting their economic well-being
	Promote sustainable harvesting of local varieties of non timber forest products, which is a good source of income, by focusing on village forests since they provide more services than natural forests
	Promote carbon trading as a potential source of income from the forestry sector
	Create wetland sanctuaries to conserve services in consultation with local people.
	Need to measure changes through monitoring and evaluation to sustain resources and sources of income
	Clear policies need to be made on how to use coastal areas since there is tension as to whether to create a green belt around coastal areas (and types of trees to be planted) to protect against storms or whether to promote shrimp farming. Such policies could have both positive and negative consequences on certain poor people.
<b>Inland Waters</b>	Implement the Water Use Act to stop river pollution and negative consequences of embankments, drainage congestion, and river encroachment
	Create forests on <i>char</i> lands to offer alternative resources and sources of income.
<b>Agro-ecosystem</b>	Land should be divided into zones to assess crop suitability and prevent invasion of alien species
	Include fair trade measures on agricultural products to alleviate poverty
	Land and industrial policies need to be amended and made complementary
	Appropriate technologies need to be adopted to minimize inputs needed for agriculture to protect ecosystem services



	Small and medium enterprises should be promoted to minimize negative environmental impacts
<b>Economic Valuation and Assessment Tools</b>	Place taxes on natural resources to conserve them
	If ecosystem services are lost measures for compensation should be included in national level policies
	Market based mechanisms need to be included in policies for efficient resource use and prevention of environmental degradation
	National Cost Benefit Analysis should be conducted along with evaluation of tangible and intangible resources
	Clear and common guidelines across all sectors need to be made regarding environmental impact assessments (EIA)
	Social scientists and legal experts should be involved in EIA
<b>Local Participation</b>	Include both local government and local people/communities/indigenous groups in valuating ecosystems, understanding ecosystems and alleviating poverty through community based natural resource management.
<b>Policies &amp; Projects</b>	Formulate policies that integrate ecosystem services and the various dimensions of poverty
	Policies need to reflect recent international policy frameworks such as Agenda 21, PRSP, MDG, etc.
	Minimize conflicts between sectoral policies and agencies through inter-agency coordination
	Draft rules and acts suitable for current conditions since policies cannot be enacted and are not legally binding, which does not hold people or agencies accountable
	Promote 'homegrown' development projects
<b>Additional</b>	Introduce demarcation of marine ecosystem and fishing areas
	Private sector should be involved in development, especially since they are efficient

Although the policies suggested are varied, a common factor is that before taking up these policy recommendations, their level of appropriateness within certain contexts in Bangladesh needs to be assessed through rigorous research. Therefore, the policies suggested can also be viewed as gaps in knowledge to a certain extent that need to be understood before implementation to maintain ecosystem services and alleviate poverty.



#### **4. Final Reflections**

Overall, the workshop was helpful in gathering information to better link ecosystem services and poverty alleviation. Presenting a draft of the SA at the beginning of the workshop helped participants not only focus on certain ecosystems, but also helped identify additional information that was not originally included in the draft (see Annex 6 for literature suggested) as well as reinforced what had already been written in the SA. It was also useful to know what various experts thought about the workshop topic so that their interests can be noted for future collaborative work. At the same time, however, it was difficult to assess the extent to which participants had actually used the concept of ecosystem services in their work since there were very few publications that were recommended during the workshop. Additionally, the concept of 'ecosystem services' or 'poverty' was not debated at all by the participants. This could be due to the fact that this workshop was not meant to be a forum for academic debates about these concepts. Finally, there were no suggestions on how gaps identified should be filled, the capacities that need to be developed to address the gaps, and how filling in these gaps will contribute to policies to alleviate poverty. Although the workshop did not address certain issues, this workshop was a critical first step to bringing in knowledge and experts in one venue to discuss the linkages between ecosystem services and poverty alleviation in Bangladesh.



## **Annex 1: Workshop Schedule**

### *Workshop on Ecosystem Services and Poverty Alleviation Study in South Asia (ESPASSA)*

8:30 – 9:00                      Registration

#### **Session 1: Situation Analysis on Ecosystem Services and Poverty**

*Chair: Dr. Mahabub Hossain, Executive Director, BRAC*

9:00 – 9:15                      ESPASSA Project Overview, Mr. Kazi Faisal Bin Seraj, Research Associate, Environment Unit, RED, BRAC

9:15 – 09:45                      Situational Analysis of Bangladesh, Dr. Moushumi Chaudhury, Senior Research Fellow, Environment Unit, RED, BRAC

09:45 – 10:00                      Discussion

10:00 – 10:15                      Tea Break

#### **Discussion on Ecosystems: Knowledge and Trends on Ecosystem Services and Drivers**

*Chair: Dr. Ainun Nishat, Country Representative, IUCN Bangladesh*

10:15 – 10:45                      Coastal Forests  
*Lead Discussant: Mr. Junaid Kabir Choudhury, Former Conservator of Forests*

10:45 – 11:15                      Inland Water  
*Dr. Inamul Haque, Director General, Water Resource Planning Organization*

11:15 – 11:45                      Agro-ecosystems  
**Lead Discussant: Dr. M. Asaduzamman, Research Director, Bangladesh Institute for Development Studies**

11:45 – 12:15                      Hills and Uplands  
*Lead Discussant: Mr. Philip Gain, Director, Society for Human and Environment Development*

12:15 – 13:00                      Wrap Up: Gaps, Skills Needed, Leverage points, Opportunities and Constraints, Challenge to Overcoming Constraints

13:00 – 14:00                      Lunch



## Discussion on Poverty and Ecosystem Service Linkages in Bangladesh

*Chair: Dr. Mahabub Hossain, Executive Director, BRAC*

- |               |   |
|---------------|---|
| 14:00 – 14:45 | Drivers and Impact of Ecosystem Degradation on the Poor<br><i>Lead Discussant: Dr. Atiur Rahman, Chairperson, Unnayan Shamunnay</i>   |
| 14:45 – 15:30 | Future Directions: Policy Responses to Ecosystem Degradation and Poverty<br><i>Lead Discussant: Dr. A.H.M. Mustain Billah, Joint Secretary, Economic Relations Division<sup>4</sup></i> |
| 15:30 – 16:00 | Tea Break   |
| 16:00 – 17:00 | Status of Ecosystem Valuation and Relevance to Poverty<br><i>Lead Discussant: Dr. A.K. Enamul Haque, Professor, East West University</i>  |
| 17:00 – 19:00 | Reception and Dinner  |

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<sup>4</sup> Dr. Enamul Haque was scheduled to speak before Dr. Mustain Billah. However, their time slots were changed last minute due to timing factors. Therefore, the concluding statements by Dr. Billah were stated earlier than expected.



## Annex 2: Description of Participants

STAKEHOLDER NAME (ORGANISATION OR PERSON)	SECTOR REPRESENTED	IF OTHER, PLEASE GIVE DETAILS	CONTRIBUTIONS THEY COULD MAKE TO THE SA	CONTRIBUTIONS THEY COULD MAKE TO THE WIDER ESPA PROGRAMME	CONTACT NAME	CONTACT ADDRESS	CONTACT TELEPHONE NUMBER AND EMAIL
Participants Who Attended							
Arannayk Foundation	Ecosystem managers		Information and experience sharing on forest ecosystem	Further NGO activities	Mr. Farid Uddin Ahmed	Executive Director Arannayk Foundation House-68, Road-1, Block-1 Banani, Dhaka-1213	1713040583 <a href="mailto:farid@arannayk.org">farid@arannayk.org</a>
Bangladesh Centre for Advanced Studies (BCAS)	Research & academia		Expert Consultancy	Future research and policy recommendations	Dr. Dwijen Mallick		<a href="mailto:dwijen.mallick@bcas.net">dwijen.mallick@bcas.net</a>
Dhaka University	Research & academia		Expert opinion and findings sharing on forest ecosystem	Future research activities	Dr. Niaz Ahmed Khan	Professor Master of Development Studies University of Dhaka	1711364462 <a href="mailto:niaz.khan@yahoo.com">niaz.khan@yahoo.com</a>
Bangladesh Environmental Lawyers Association (BELA)	Civil society		Information on issues related to environmental law and advocacy;	Pressure group on implementing environmental laws and regulations	Ms. Bahreen Khan	BELA House # 15A, Road #3 Dhanmondi Dhaka 1205	Tel: +880-2-8614283, 8618706 (off.) <a href="mailto:bela@bangla.net">bela@bangla.net</a>



Bangladesh Forest Research Institute (BFRI)	Research & academia		Research findings on forest ecosystem	Future research on forest ecosystem and poverty	Dr. M. Khairul Alam	BFRI PO Box 273 Chittagong 4000	31681585 <a href="mailto:mkalam@click-online.net">mkalam@click-online.net</a>
Bangladesh Institute of Development Studies (BIDS)	Research & academia		Lead discussant, key informant and expert on research related to agro-ecosystem	Research findings on development and expert opinion	Dr. M. Asaduzzaman	Research Director BIDS E-17 Agargaon, Dhaka	Tele: 8118920 <a href="mailto:asad@sdbd.org">asad@sdbd.org</a>
BARCIK	Research & academia		Information on traditional knowledge for managing ecosystems		Mr. Kamruzzaman	Coordinator (Research) BARCIK House #50, Road #16 (new), 27 (old) Dhanmondi Dhaka-1209	Tel: +880-2-9132372 <a href="mailto:barcik@bdonline.com">barcik@bdonline.com</a>
Center for Sustainable Development (CFSD)	Ecosystem managers		Experience sharing and expert opinion on ecosystem management	Pressure group for future policy making	Mr. Mahfuz Ullah	Secretary General CFSD House # 8/6 (1st Floor), Block # B Lalmatia Dhaka-1207	Tel: +880-2-9116037(Direct) <a href="mailto:cfcd@bdcom.net">cfcd@bdcom.net</a>
Centre for Global Change (CGC)	Research & academia		Information on scientific research on environment		Dr. Ahsan Uddin Ahmed	Executive Director	Tel:018184468224 01714132578; 9142238 <a href="mailto:ahsan.ua@gmail.com">ahsan.ua@gmail.com</a>
East West University	Research & academia		Lead discussant and key researcher on environmental economics	Future research related to ESPASSA	Dr. Enamul Haque	Professor Department of Economics	<a href="mailto:e.haque@ewubd.edu">e.haque@ewubd.edu</a>



Environment and Social Development Organization (ESDO)	Ecosystem managers		Sharing experience on ecosystem management		G. M. Jaglul Islam	Programme Officer ESDO House #8/1, Block-C Lalmatia Dhaka 1207	01818-035988 esdo@bdmail.net
Forest Department			Sharing experience forest ecosystem management	Future contact point for government forestry projects	Ishtiaq U. Ahmed	Conservator of Forests	8127222 <a href="mailto:ahma26@umn.edu">ahma26@umn.edu</a>
Forum of Environmental Journalists of Bangladesh (FEJB)	Media & the press		Information on wide range of ecosystem management opportunities	Awareness, communication and information dissemination	Mr. Quamrul Islam Chowdhury	Chairman FEJB 42/1, Kha, Segun Bagicha Dhaka-1000	Tel: +880-2-9330354, 9336987 Mob: 01552397643 fejb@bangla.net
Integrated Water and Flood Management (IWFM)	Research & academia		Water management related information and knowledge sharing		Prof. Md. Rezaul Rahman	Professor IWFM Bangladesh University of Engineering and Technology (BUET) Dhaka 1000	Tel. 880-2-9665601; PABX:880-2-9665650, Ext.7303,7506 <a href="mailto:rezaul@iwfm.buet.ac.bd">rezaul@iwfm.buet.ac.bd</a>
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Local Government Engineering Department	Development policy-makers & planners		Contact point for government's rural projects		Md. Nurul Islam	Addl. Chief Engineer LGED	8158626 <a href="mailto:nislam51@hotmail.com">nislam51@hotmail.com</a>



Nature Conservation Management (NACOM)	Ecosystem managers		Experience sharing and expert opinion on community based ecosystem management		Dr. Abdur Rob Mollah	Chairman NACOM 8/12, Block-B Lalmatia Dhaka 1207	Tel: +880-2-9121437, 017680704 nacom@bdonline.com; nacom@citech.net
Planning Commission	Development policy-makers & planners		Lead discussant and key person on policy related issues regarding poverty and ecosystem	Government person for integrating ecosystem concepts into national planning	Dr. A.H.M. Mustain Billah	Joint Secretary (UN Wing) Economic Relations Division (ERD) Sher-e-Bangla Nagar Dhaka	Tele: 88-02-8112682
Society for Environment and Human Development (SEHD)	Ecosystem managers		Lead discussant and expert on hill ecosystem and upland forestry	Information and experience sharing on hill ecosystem and forestry management	Mr. Philip Gain	Director SEHD 4/4/1 (B) (3rd Floor), Block-A, Lalmatia, Dhaka-1207	Tele: + 880-2-9121385 01715009123 <a href="mailto:sehd@citechco.net">sehd@citechco.net</a>
Water Resources Planning Organization (WARPO)	Research & academia		Information on water resource management	Future planning design	Saiful Alam	Principal Scientific Officer WARPO	<a href="mailto:saif314@bdonline.com">saif314@bdonline.com</a>
Water Resources Planning Organization (WARPO)	Research & academia		Lead discussant and key informant on information related water resource management and ecosystem	Future planning design	Mr. Md. Inamul Haque	Director General WARPRO House-103, Road-1 Chairman Bari, Banani, Dhaka	Phone: +880-2-8814217, +880-2-8814554, +880-2-8814556, 9880875 <a href="mailto:dg_warpo@bangla.net">dg_warpo@bangla.net</a> <a href="mailto:warpo@citechco.net">warpo@citechco.net</a>
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						R/A Dhaka	
Unnayan Shamannay	Research & academia		Lead discussant and key researcher on poverty and environment	Future research support and activities	Atiur Rahman		8610332 <a href="mailto:atiur@sdnbd.org">atiur@sdnbd.org</a>
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## Annex 3: ESPASSA Project Overview




# Ecosystem Services and Poverty Alleviation Study in South Asia (ESPASSA)

Kazi Faisal Bin Seraj  
Research and Evaluation Division (RED)



## Background


- The Millennium Development Goals (MDG) emphasizes primarily on reducing poverty and hunger
- The Millennium Ecosystem Assessment (MA) showed that the loss of ecosystem services is a significant barrier in achieving poverty related targets set by MDG
- In recognition to MA, three UK agencies commissioned four regional projects in China, Amazon, Africa, and India and the Hindu-Kush Himalayan Region
- The three UK agencies involved are
  - NERC: Natural Environment Research Council
  - DFID: Department for International Development and
  - ESRC: Economic and Social Research Council




## Millennium Ecosystem Assessment

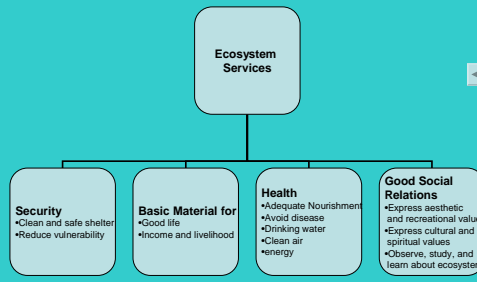
Ecosystem Services			
Provisioning Services	Regulating Services	Cultural Services	Supporting Services
Products obtained from ecosystems such as food, energy, water and biochemical	Benefits obtained from regulation of ecosystem processes such as climate, disease and water regulation	Nonmaterial benefits obtained from ecosystems such as spiritual, recreational, aesthetic and educational	Services necessary for the production of all other ecosystem services such as soil formation, nutrient cycling and primary production

- Well-being exists on a continuum with poverty, which has been defined as "pronounced deprivation in well-being"
- An ecosystem is a dynamic complex of plant, animal, and microorganism communities and the non-living environment, interacting as a functional unit.
- Ecosystem services are the benefits people obtain from ecosystems.





## Millennium Ecosystem Assessment



```

graph TD
    ESS[Ecosystem Services] --> S[Security]
    ESS --> BM[Basic Material for]
    ESS --> H[Health]
    ESS --> GSR[Good Social Relations]
    
```

**Security**

- Clean and safe shelter
- Reduce vulnerability

**Basic Material for**

- Good life
- Income and livelihood

**Health**

- Adequate Nourishment
- Avoid disease
- Drinking water
- Clean air
- energy


**Good Social Relations**

- Express aesthetic and recreational values
- Express cultural and spiritual values
- Observe, study, and learn about ecosystem

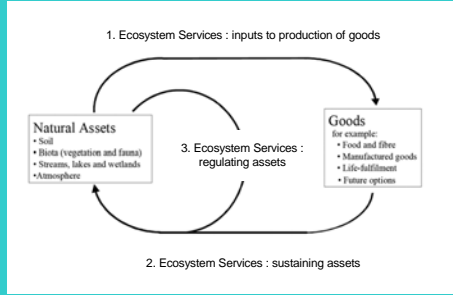


## An Alternative Approach

- 'ecosystem services are components of nature, directly enjoyed, consumed, or used to yield human well-being' (Boyd and Banzhaf 2006)
- This definition makes the distinction between consumptive goods on the hand and services on the other that can be considered in terms of transformations of energy and mass.



## An Alternative Approach



```

graph LR
    NA[Natural Assets] -- "1. Ecosystem Services : inputs to production of goods" --> G[Goods]
    G -- "2. Ecosystem Services : sustaining assets" --> NA
    NA -- "3. Ecosystem Services : regulating assets" --> NA
    
```

**Natural Assets**

- Soil
- Biota (vegetation and fauna)
- Streams, lakes and wetlands
- Atmosphere

**Goods** for example:

- Food and fibre
- Manufactured goods
- Life-fulfilment
- Future options

Source: Cork et al. 2001



## Transformation of Flow and Services



- Transformations of natural assets into products valued economically and in other ways by people in an area (exploitable 'natural' products)
- Transformations of the by-products of goods from ecosystem services back into natural assets
- Internal transformations among natural assets to maintain those assets

## Scope of Work



- To provide a Situation Analyses to define the current status and relationship between ecosystem and poverty by early 2008
- To identify and analyze the ecosystem services most important to the wellbeing of the poor
- To identify the main threats to these ecosystems
- To identify management opportunities for maximizing poverty alleviation
- However, the timeframe is short and there are no scopes for any empirical studies
- Extensive literature review and stakeholder engagement process
- The findings will facilitate the development of an "Ecosystem Services and Poverty Alleviation" ESPA programme

## ESPASSA



- The Situation Analysis in South Asia is called the "Ecosystem Services and Poverty Alleviation Study in South Asia" (ESPASSA)
- The countries involved in ESPASSA are India, Pakistan, Nepal, Bhutan and Bangladesh
- The consortium members for the project are
  - The World Conservation Union (IUCN)
  - The Energy Research Institute (TERI)
  - Sustainable Development Policy Institute (SDPI)
  - Institute for Sustainable Water, Integrated Management and Ecosystem Research (SWIMMER) and
  - BRAC
- The consortium is being led by Dr. R. K. Pachauri from TERI, India

## Purpose of the Stakeholder Workshop



- To provide a forum through which dialogue can be established with key organizations/individuals such as ecosystem managers, policy makers and experts in the field of ecosystem services and poverty
- To provide the stakeholders with an opportunity to contribute to the situation analyses
- Dialogues among stakeholders will result in a more accurate and acceptable report that can be used for policymaking

## Expected Outcomes



We would like to have answers to the following questions:

- a) What are the trends in the state of the ecosystem and how has this affected the availability of different ecosystem services?
- b) What are the major drivers to account for the changing availability of these ecosystem services?
- c) How have global-level drivers contributed to local-level changes in the availability of these ecosystem services?
- d) Which are the policy-related drivers that have turned out to be most influential for different ecosystems?
- e) What has been the policy response to changing availability of ecosystem services? and
- f) To what extent it has been effective in addressing the poverty-related consequences of such changes?

## Expected Outcomes



- In recognition of the knowledge available as well as the information gap we would like to know:
  - How will filling in these gaps contribute towards the overall goal of poverty alleviation?
  - How can we fill these information and knowledge gap?
  - Is there a scope for capacity building in researching on these issues?
  - What would be the contribution of such capacity building towards the long term national and regional development agendas to reduce poverty?





## Continuing the Engagement Process

- *Mass media*
- *Organization level networks*
- *The internet: [www.espassa.org](http://www.espassa.org)*
- *National level stakeholder workshops*



Thank You



## Annex 4: Situational Analysis of Ecosystem Services and Poverty Alleviation in Bangladesh<sup>5</sup>

### A Situational Analysis of Ecosystem Services and Poverty Linkages in Bangladesh

*Ecosystem Services and Poverty Alleviation  
Study in South Asia Workshop  
BRAC Centre, Dhaka  
17 October 2007*



#### Building the Situational Analysis

- **Millennium Ecosystem Assessment**
  - Provisional Services
  - Regulatory Services
  - Non-material Benefits
- **Well-Being**
  - Security
  - Basic Material for a Good Life
  - Health
  - Good Social Relationships
  - Freedom of Choice and Action

2

#### Building the Situational Analysis Cont'd

- **Drivers of Change**
  - **Natural / Direct:** local land use and cover; species introduction or removal; technology adaptation or use; external inputs; harvest and resource consumption; climate change; natural/physical/biological drivers
  - **Social / Indirect:** demographic; economic; socio-political; science and technology; cultural/religious

3

#### Building the Situational Analysis Cont'd

- Published, academic literature reviewed between 1997-2007
- Focus on rural areas
- Topics: wetlands (coastal forests and inland water); agro-ecosystems; hills and uplands
- Research Gaps

4

#### Wetlands

- Includes: marsh, fen, peatland/wasteland, water which is static/flowing, fresh, brackish/salt including areas of marine water (Ramsar Convention Bureau)
- Rivers, streams, lakes, rice fields, shrimp farms, inland flood forests, swamps, and coastal mangroves (Billah 2004)

5

#### Coastal Mangroves ~ The Sundarbans

- **Provisional Forest Services:**
  - **Wood**
    - Revenue generated from fuelwood: US\$ 261,775/year (Billah 2004)
  - **Non-timber forest products**
    - Tk. 1.3 billion/year (Billah 2004)
- **Well Being:**
  - Economic
  - Food Security
  - Health

6

<sup>5</sup> The pictures in these slides have been removed to minimize the file size.



## Coastal Mangroves ~ The Sundarbans

- 'Irreversible' and 'sick'
- Drivers:
  - Demographic: population pressure
  - External Input: Electrification Project
- Impacts:
  - Loss of natural resources
  - Loss of stumpage value of trees

7

## Shrimp Farming in the Sundarbans

- Export revenue: US\$360 million (12 times more profitable than HYV rice (Ali 2006))
- 81.3% of non-poor households and 18% of poor households are involved (Rahman and Hassan eds. 2006)
- 30% of women in coastal areas are directly or indirectly involved in small-scale fisheries, including shrimp fry collection (Karim et al. 2006)
- Well-being: income (economic) and food security (health)

8

## Impact of Shrimp Farming

- Impact on coastal forest ecosystem:
  - Reduced insect attacks and improved soil quality (Karim et al. 2006)
  - Salinity; damage to nurseries, newly planted mangroves and reserve forests; affects rice cultivation (Hoq 2007; Karim 2006)
- Impact on well-being:
  - Increase in unemployment for agricultural farmers (Karim 2006); affects availability of clean water and women's time and labour (Crow and Sultana 2002); decreases vegetable and livestock consumption affecting health and livelihoods (Crow and Sultana 2002)
  - Cyclone Sidr: destruction of forests, lives and livelihoods (Chowdhury 2007; Manik and Khan 2007)

9

## Inland Waters

- Essential provisional services: production (irrigation, energy, fish) and domestic use (drinking and sanitation)
- Essential regulatory services: flushing toxins, recharging reservoirs

10

## Inland Waters ~ Floods

- Flooding as a natural driver
  - 34% of land submerges under water between 5 to 7 months of the year
  - Alters land availability and composition
  - Affects 60% of households (Rahman and Hassan eds. 2006)
  - Exacerbates poverty; creates land/homelessness through displacement

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## Impact of 1998 Flood

- Damages caused by ecosystem change
  - 60% of land affecting 30 million people (Hutton and Haque 2004)
  - 2.04 million metric tons of rice crop loss (Ninno et al. 2001)
  - 55% of households lost asset worth Tk. 6,936, equivalent to 16% of pre-flood total value of assets (Ninno et al. 2001)
  - Diarrhea and respiratory illnesses (Hutton and Haque 2004; Ninno et al. 2001)
  - 15.6% of flood-exposed households became food insecure (Ninno et al. 2001)

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### ***River Bank Erosion***

- 2,000km to 3,000km of river bank erosion per year (Hutton and Haque 2004)
- 31% of household susceptible to erosion (Rahman and Hassan eds. 2006)
- Affects poor and small landowners who live near river banks (Brouwer et al. 2006)
- Displacees are poor as 62% live on US\$1-2/day (Hutton and Haque 2004)
- Mental stress and social fragmentation, especially difficult for women (Hutton and Haque 2004)

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### ***Development Projects as Drivers of Inland Water Change***

- Degradation of services due to industrialization affecting health and economic well-being (Alauddin and Quiggin 2007)
- Farakka Barrage: droughts and salinity leading to US\$3 billion loss (Rahman and Hassan eds. 2006)
- Kaptai Dam: displacement of poor 'tribal' people and *jhum* cultivators (Rahman and Hassan eds. 2006)

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### **Agro-ecosystems**

- Agriculture contributes to 23.5% of GDP (BBS 2005)
- 66% of population depends on agriculture as a major source of income (BBS 2005)
- Highest percentage of land under agriculture in South Asia (Alauddin and Quiggin 2007)

15

### ***High Yielding Varieties (HYV) ~ Rice***

- 61% of rice production by HYV (Baffes and Gautum 2001)
- Increased food production while minimizing area of land required
  - Incidence of poverty fell from 41.5% in 1990 to 31.9% in 2001 (Alauddin and Quiggin 2007)
  - Increase in income regardless of economic status and gender; lowers economic and food insecurity (Hossain, unpublished)

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### **Agro-ecosystems**

- Agriculture contributes to 23.5% of GDP (BBS 2005)
- 66% of population depends on agriculture as a major source of income (BBS 2005)
- Highest percentage of land under agriculture in South Asia (Alauddin and Quiggin 2007)

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### ***HYV ~ Rice Cont'd***

- Ecosystem Change:
  - Decline in soil quality due to excessive use of fertilizers and pesticides (Hossain, unpublished; Rahman and Parkinson 2007)
    - More than 65% of agricultural land suffers from decline in soil fertility (Rahman and Parkinson 2007)
    - Led to loss of plants and animals but increase in pests (Hossain, unpublished)
  - Groundwater
    - Groundwater loss causing droughts (unless irrigation is available (Hossain, unpublished); 30% of cultivable land is affected by drought (Alauddin and Quiggin 2007)
    - Chemical run-off from fertilizers causing leaching of nitrate
    - Arsenic poisoning affected 20 million people since 1993 where 74% of poor households use arsenic contaminated water (Rahman and Hassan eds. 2006)

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## Additional Drivers of Change in Agro-ecosystems

- Ecosystem Change:
  - Sea water in agro-ecosystems increases salinity
  - Beel Dakatia (an 'ecological crisis'): Development projects increasing salinization and waterlogging (Rahman 1995)
    - Loss of economically valuable trees, land productivity, livestock, kitchen gardens, fisheries, biodiversity, and clean drinking water

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## Well-being in Agro-ecosystems

- Change in Well-being:
  - Fall in real income from HYV rice crops by 18% (Rahman 2003) due to deterioration of ecosystem services with rise in agricultural inputs (Hossain, unpublished)
  - Effects on health due to nitrate leaching and arsenic poisoning
    - Poor women are especially vulnerable because they are nutrition-poor to fight illnesses and they do not have enough financial resources to buy expensive tube well to extract clean water
    - Social repercussions of bodily harm affecting mental well-being and 'unmarriability' status

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## Hill and Upland Ecosystems

- 6% of land is considered *public* forest (Gain 2002)
- Impact of plantations in Chittagong Hill Tracks

21

## Impact of Land Use on Hill and Upland Forests

- Teak and rubber plantations
  - Monocultures activities as a way to promote economic development have degraded soils
  - 75% of hill areas are susceptible to soil erosion
  - Marginalization from land (Gain 2002)
- *Jhum* (slash and burn) cultivation
  - Population pressure and land encroachment allows for short fallow periods and regeneration of soil and vegetation
  - Lack of secure land tenure to switch to agroforestry
    - (Rasul and Thapa 2006; Rasul et al. 2004; Salam et al. 1999; Thapa and Rasul 2006)
  - Worsen poverty of poor 'tribal' people, especially women since they are losing forest resources for subsistence and commercial purposes, increasing their time and burden of work (Gain 2002; Rahman and Hassan eds 2006)

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## Knowledge Gaps

### Articles Relating to Direct / Natural Ecosystem Drivers

Direct / Natural Driver	Ecosystem	Author	Total Number of Publications
Local land use and cover and harvest and resource consumption (i.e. shrimp, NTFP, timber, agricultural products)	(a) Coastal Mangroves	Ali (2006), Billah (2003), Hoq (2007), Islam ed. (2004)	4
	(b) Hills	Gain (2002), Ilmekhar and Hoque (2005), Islam and Weil (2000), Rasul and Thapa (2006), Rasul et al. (2004), Salem et al. (1999), Thapa and Rasul (2006)	7
Species introduction or removal	(a) Coastal Mangroves	Ali (2006)	1
	(b) Hill and Upland	Gain (2002)	1
Technology adaptation and use (i.e. Green Revolution)	Inland Water	Alauddin and Quiggin (2007), Baffes and Gautum (2001), Desmann (1988), Garcia and Allier (2005), Niazi (2003), Hossain (7), Peterson (1987), Prescott-Alken (2001), Rahman (1995, b), Rahman (2003, c), Rahman and Parkinson (2007), Rasul and Thapa (2004)	12

23

## Knowledge Gaps Cont'd

### Articles Relating to Direct / Natural Ecosystem Drivers

Direct / Natural Driver	Ecosystem	Author	Total Number of Publications
External inputs (i.e. development projects, industries)	(a) Coastal Mangroves	Billah (2003), Islam ed. (2004)	2
	(b) Inland water	Choudhury et al. (2004), Islam ed. (2004), Rahman (1995, a), Rahman and Hassan eds. (2006), Zahid and Ahmed (2006)	5
	(c) Hill and Uplands	Gain (2002)	1
Natural, physical, or biological (i.e. cyclones, floods)	(a) Coastal Mangroves	Choudhury (2007), Manik and Khan (2007)	2
	(b) Inland water	Few (2003), Hutton and Haque (2004), Kunii et al. (2002), Nimmo et al. (2001), Rahman and Hassan eds. (2006)	5

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## Knowledge Gaps Cont'd

### Articles Relating to Indirect / Social Ecosystem Drivers

Indirect / Social	Ecosystem	Author	Number of Publications
Demo-graphic	(a) Hills	Iftekhar and Hoque (2005)	1
	(b) Coastal Mangroves	Ali (2006), Billah (2005), Islam ed. (2004)	3
Economic (general)	Coastal Mangroves	Billah (2003), Crow and Sultana (2002), Hoq (2007), Islam ed. (2004), Karim et al. (2004)	5
Socio-political			0
Science and technology			0
Cultural / Religious			0



## **Annex 5: Case Study: Agro-ecosystems**

Dr. M. Azaduzaman, Research Director BIDS

Land and water are very important in this created ecosystem. Land is different in different places and the natural availability of water also varies from region to region. In most places we are dependent on rainwater. Sometimes the rainwater flows as surface runoff and at other times it goes underground and becomes a part of groundwater. When it collects on any surface as inland water we try to use it from there as a natural resource. Rainfall distribution is very different in different places and this is due to the varying climate and weather of different regions. Climate change is another factor affecting the rainfall in different regions in recent times. When we talk about the natural fertility of land, which is necessary for crop production, we have to remember that not all regions are naturally fertile and all crops do not need the same kind of fertility in soil. The human choice of crop has developed over a very long period of time and is very dependent on the climate and land of the area. For example, rice cultivation in Bangladesh has been done for centuries because the climate and soil of this area is very suitable for it. Those of you who have an interest in this topic must know that, 50 or 100 years ago in Sylhet we used to grow deep water rice where as we didn't grow that variety anywhere else, and these choices have been made over a long period depending on the natural circumstances of the area.

Over time, many changes have been made. In some places the mouth of a river or *Khal* has been sealed closed and this has stopped the flow of water towards the inside, which has further caused a change in the ecosystem. But what was the benefit of doing that? And what was the social driver and where it comes from? As soon as the area was closed off, influential local people used the land that was filled up. Later on after issues of encroachment came up we don't know exactly how much could be saved or recovered.

Overall a driver of change in agriculture is population growth. In 1971 we had 70,000,000 people but now we have 150,000,000 people. Now this population needs to be fed. Agriculture has a big importance as it provides food. Jute was once very important for export earnings, but not anymore. Agro-ecosystem has provided us with a huge amount of export earnings in the initial stages of our country. Many people are directly or indirectly involved with agriculture in our country. We should relate these with the threats. People's interests' should be most important in the minds of the policy makers. When flood embankments were made we always thought of how much it would benefit the agriculture. We never took into account the changes it would bring in the ecosystem.



It is never sufficient to replenish the natural fertility of land. Policy is an important driver. Whether we should give subsidies or not for fertilizers and pesticides is an important question. Once upon a time, there were many subsidies for fertilizers, irrigation, etc. All this has ultimately affected the agro-ecosystem and the intrinsic fertility of soil has decreased. Crop choice has changed, HYV has been introduced, fertilizer intensity increased, and water use increased, which increased the amount of irrigation needed. Therefore, overall irrigation has become costlier than before due to these various reasons. All these affect the agro-ecosystem. When the input we give interacts with the natural ecosystem, the ecosystem can never be reversed back to how it was. So the changes in the ecosystem have taken place over time.

Our country is still dominated by rice production, rice is our main food, and food security means rice. Crop diversification or food diversification never occurred to us. There is something called hydroponics agriculture where land is not directly involved, nutrients are put in water and crops are grown there, but that does not sustain most crops. It can be done in case of lettuce and strawberries etc. So the availability of land is very important, but the importance of land has fallen by 1% per year. The physical system of land and water has been disturbed so much for the production of food, and as to whether we have exceeded the threshold of the carrying capacity of land is something we do not know yet.

A few other things did not happen, like crop diversification, even though attempts were taken in our country. For example, in the North West of our country, there is a huge ADB project in which they are investing huge amounts of money and they are replacing the major traditional crops which is potato. Somehow this is not working out. Rice and the relationship it has with agro ecosystem cannot be explained by culture alone. When people's income increases the amount of cereal consumed decreases and this has happened in Bangladesh too. When there are other types of food available the intake of cereal decreases. Even in Bangladesh the food intake in terms of pulses has decreased, but large portions of other food, which are not produced inside the country, but rather imported from outside the country, have replaced pulses. Is our agro ecosystem not good enough for anything else other than the production of rice and pulses?'



## Annex 6: List of Additional Publications Suggested

Source Type	Authors	Year	Title of Article/Chapter	Full Journal or Book Reference	Brief Detail
Report	Asian Development Bank			Flood Action Plan 12 & 13	Adverse effects of flooding
	BARCIK				<i>Haor</i> ecosystems (wetlands)
	International Centre for Integrated Mountain Development			Bees	Information on the impact of foreign species on the environment
				National Environmental Management Action Plan	
Project Report	Nishorgo Project				Suggests how to revive native species
Book	Phillip Gain	2007		Stolen Forests	Description of the impact of development projects on forested areas



**STAKEHOLDERS WORKSHOP IN THE ECOSYSTEM SERVICES AND POVERTY  
ALLEVIATION PROGRAM (ESPA)  
FOR BHUTAN**



**22 December 2005  
Project sponsors**

**NERC, ESRC, DFID-UK**



## **Workshop Background:**

The need for stakeholder engagement for the situation analysis was emphasized due to the interactions between humans and the ecosystems and the impact that human behavior has on the ecosystems. Ecosystems cater to multiple needs and stakeholders and there are constant conflicts and compromises in the management and use of the systems. Dominant stakeholders have more say in the use of ecosystems though the poorest sections of society may pay higher prices for use or misuse of the systems.

The workshop focused on as diverse representation as possible and strove to achieve an understanding of ecosystem services and their contribution towards poverty alleviation. It sought to identify trends and drivers in the ecosystems and to understand the impact of changes in the ecosystem on the poor and their responses. It also sought to access policy response to the availability of ecosystem services.

It was also important to assess knowledge gaps especially in a country like Bhutan which is on the cusp of development: and to identify capacity building measures which will hopefully not only improve our understanding, but also our use and management of ecosystems.

## **The workshop outcomes as identified by the workshop briefs were defined as follows: Hopefully our workshop addressed or attempted to address the identified issues**

1. What are ecosystem services and how do they contribute to poverty alleviation?
2. What are the trends in the state of ecosystems and how has this affected the availability of different ecosystem services over time and across space?
3. What are the major drivers (direct and indirect) to account for the changing availability of ecosystem services over time and across space? How have global-level drivers contributed to local-level changes in the availability of ecosystem services? Which are the policy-related drivers that have turned out to be most influential at different ecosystem scales?
4. What has been the impact of the changing availability of ecosystem services on the poor and how has the latter coped?
5. What has been the policy response to changing availability of ecosystem services and to what extent it has been effective in addressing the poverty-related consequences of such changes?

## **Organization of workshop**

Ecosystem, by definition, involves interactions between various actors and in the quest to find a common understanding of ecosystem in the Bhutanese context, a workshop involving various stakeholders was organized in Bhutan. The stakeholders involved varied from institutions (policy and decision makers) to resource users, environmentalists, researchers/academia, to members of the private sector to be able to obtain a wide range of opinions and views on the understanding of Ecosystem and the impact of the ecosystem services and its linkages to poverty alleviation. The list of the attendees and the organizations they have represented are attached as *Annexure 1*.

The participants for the workshop were chosen for their technical expertise in their various fields and also keeping in mind the scenario in Bhutan. As far as possible we tried to include participation from all the stakeholder groups identified by the workshop brief. There were some constraints faced by the potential bringing together of deeply technical persons and non-technical persons who while affected in a personal manner by ecosystems management would have been at odds with the technical aspect of some discussions. This was also the reason for separation of some discussions vis-a vis the Buddhist discussion.

For participation from the policy makers we felt that representation from the National Environment Commission would be best suited as they are tasked with the burden of



environmental management and oversight in Bhutan. While the Planning Commission ultimately designs policy, it is done with the input from the line ministry. The NEC is held in deep respect and is key to the development and implementation of the environmental policy in Bhutan.

The Ministry of Agriculture is the largest ministry in Bhutan and has the most comprehensive grass roots organization. Their participation was at several levels at this meeting from participation as members of academia to grassroots managers of ecosystems.

Civil society is not a widespread phenomenon in Bhutan with the Civil Society Act being passed only recently. The Royal Society for Protection of Nature<sup>6</sup> (RSPN) is only environmental NGO in Bhutan and works at a grassroots level as well as running it's own information wing (included a widely distributed newsletter).

As our economy is still developing there is hardly a plethora of private and public companies benefiting from environmental resources. We got representation from some key players like the Department of Tourism (tourism being one of the key foreign exchange earners and dependant on the maintenance of ecosystems).

Private companies like Bio Bhutan have also started to utilize organic resources with donor help. The Ministry of Agriculture remains one of the biggest promoters of the use of bio material. They help organize production as well as distribution of goods by farmers.

Bhutan trust fund was established to fund for research and community driven projects concerning the environment. They encourage the conservation and sustainable use of natural resources.

We were constrained by the winter factor in Bhutan. Winter is a season where many go on pilgrimage etc. and along with the reduced working hours<sup>7</sup> and 'workshop fatigue syndrome' hampered our efforts at getting optimal representation.

## **Introduction**

The Chief Guest of the Workshop was Hon'ble Dasho Paljor Dorji, who used to head the National Environment Commission (NEC) in Bhutan and now is special advisor to the NEC and has contributed and advocated extensively in the field of environment in Bhutan.

Hon'ble Paljor Dorji welcomed all the participants in the Workshop by stating the importance of nature and natural resources in our daily lives. He said that although the Bhutanese have been fortunate, we have the tendency of taking nature for granted, and over time and the consumption patterns are drastically changing, calling for new strategies and actions to meet these challenges.

Hon'ble Dasho also praised and appreciated the leadership of our Kingdom in introducing policies towards protecting the natural resources and he has full faith under the new leadership that such actions will be further encouraged as they are faced by different challenges with ever emerging new relationships between mankind and nature.

Hon'ble Dasho concluded the Workshop address with the note to remind all the participants the importance of this study which would examine the causes, drivers, and impacts towards ecosystem. He encouraged the experts present from different fields and walks of life to be involved and discuss and present their experiences and case studies and share amongst the other participants for greater knowledge and dissemination of information.

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<sup>6</sup> RSPN was established Dasho Paljor Dorji

<sup>7</sup> Working hours in Bhutan in winter are 9 a.m. to 4 p.m. given our harsh winters



The facilitator of the workshop then introduced the aims, objectives and the expected outcomes of the workshop as given in the workshop brief.

## Discussion and presentations

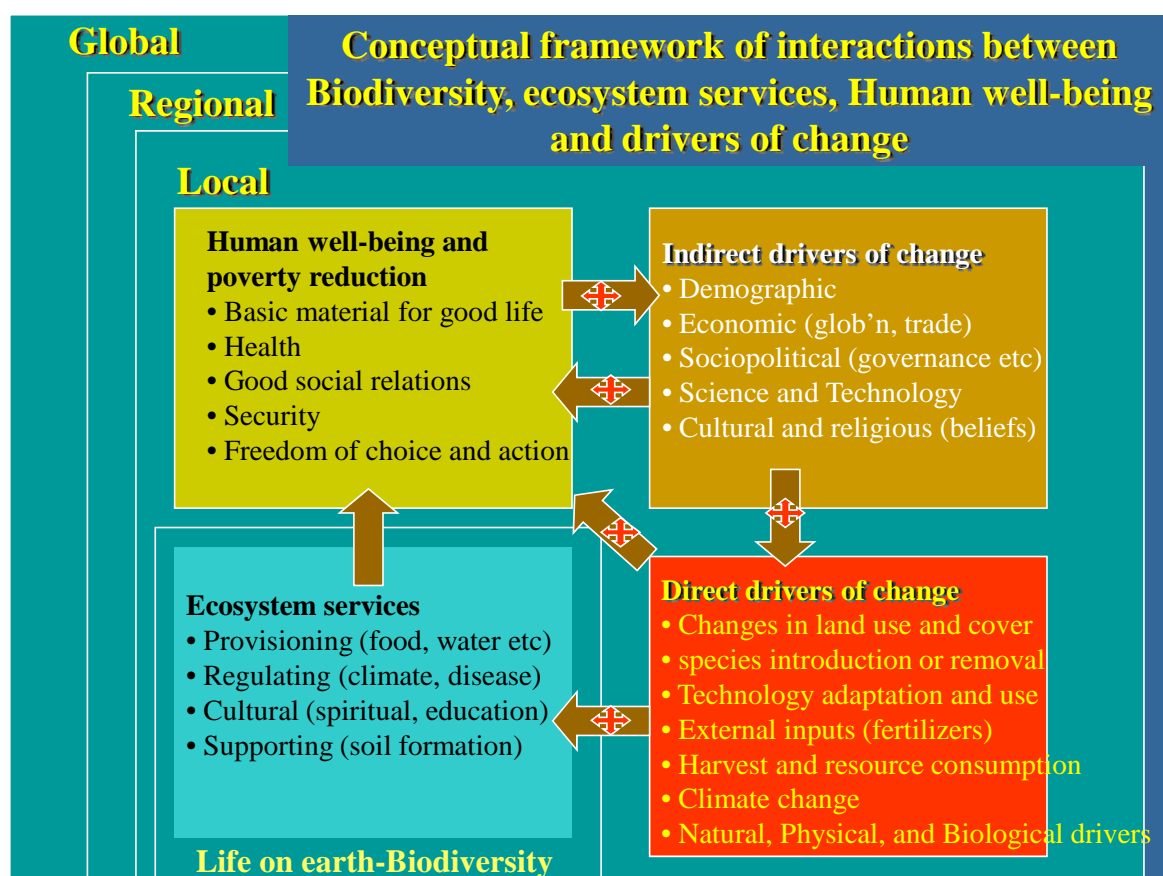
### Ecosystems

*Definitions below are an amalgamation of the discussions and presentations made on this topic.*

An ecosystem is a dynamic complex of plant, animal and microorganism community and the non living environment interacting as one functional unit.

Ecosystems can be a community of animals and plants interacting with one another and their physical environment. (Interaction among all organisms in any given habitat where people are also part of the ecosystems)

Humans are an integral part of ecosystems. The health and well being of the human populations depend upon the services provided by the ecosystem and their components (organisms, soil, water and nutrients). Ecosystems vary in size and can be as large as an ocean basin and as small as a temporary pond in a tree hollow.



Framework submitted by Dr. Pema Wangda



Ecosystems services are the benefits that we derive from the ecosystems. Ecosystem services are the processes by which the environment produces resources that we often take for granted such as clean air, water, food and the materials. The ecosystems provide a plethora of services that run the gamut from the ability to moderate weather extremes and their impacts, disperse seeds, mitigate drought and floods, maintain biodiversity, purify water etc. The services can be classified as:

Supporting services:	soil formation, photosynthesis, primary production, nutrient cycling, water cycling.
Provisioning services:	food, fuel, fibre, genetic resources, natural medicines, ornamental resources, wood, fodder etc.
Regulating services:	air quality, climate regulation, erosion regulation, water purification, disease regulation, pest regulation, pollination, natural hazard regulation.
Cultural services:	non material benefits such as spiritual enrichment, cognitive development, reflection, recreation, aesthetic values

Ecosystems services contribute significantly to global employment and economic activity (2.6 billion people engaged in agriculture) and the degradation of ecosystem services represents a significant loss of capital assets both renewable and non renewable. Even the wealthiest of society and nations cannot be fully insulated from the degradation of ecosystem services given the globalization of the economies of the world as well transboundary effects of drivers. (Slowing of regional economic growth and climate change)

There was more discussion as to the classification of the ecosystems within Bhutan. Ecologists defined it as per ecological zones or altitudinal zones. Others argued that the agro zones should also be included.

The research and academia team submitted a foundation of terms to be used as a basis for reference. During activities Groups were encouraged to add in ecosystems classifications they felt should be further included. Participants were to consider as many or as few ecosystems during the discussions:

Classifications submitted by the Research team (detailed descriptions in annexure 2)

- Alpine ecosystem (alpine rocky outcrops, alpine meadows, rhododendron scrubs)
- Temperate conifers (blue pine, fir, spruce, hemlock, juniper)
- Broad leaf forests (deciduous & evergreen broadleaf forests types)
- Dry chirpine ecosystem (chirpine)
- Fresh waters and wetlands (open lakes, snow covered areas, glaciers, rivers, streams, marshlands)

### Activity 1 outcome

The table given by the workshop brief was used as a reference

Ecosystem chosen (brief description of location, scale importance etc.):	
Stakeholders (in descending order of importance)	Interests
1	
2	
3	
4	
5	
6	



There were a lot of similarities in perception. Most groups felt that the communities were the most important stakeholders as they were directly dependant and thus directly affected by changes in the ecosystems.

Attached below are the tables submitted by various groups

### **Group 1: Research and Academia**

<b>Group: Research and Academia</b>		
Stakeholders (in descending order of importance)	Interests	Stakeholders
1 Fresh water and wetlands	Hydropower, Drinking water, Irrigation, Water purification, Habitat for aquatic lifeforms, Research (Climate Change), Carbon sink	DoE <sup>8</sup> , DoT <sup>9</sup> , DoF <sup>10</sup> , DoA <sup>11</sup> , NEC, UN, CoRRB <sup>12</sup> , Communities, IPCC <sup>13</sup>
2 Alpine Ecosystem	Pasture Land, Medicinal Plants, Habitat for Biodiversity, Aesthetic, Ecotourism, Carbon sink, Research	DoT, DoF, DoA, DoL <sup>14</sup> , NEC, UN, CoRRB, NBC <sup>15</sup> , NITM <sup>16</sup> , Communities, IPCC, Woodbased Industry
3 Temperate conifers	Timber, Watershed, Habitat for Biodiversity, NTFP, Livestock, Carbon sink	DoF, Communities, DoL, DoE, IPCC, DoA, NRDC <sup>17</sup> , Woodbased Industry
4 Broadleaf Forest	Biodiversity, Timber, Watershed, Livestock, NTFP, Carbon sink,	DoF, DoL, Communities, DoE, DoA, IPCC, NRDC, Woodbased Industry
5 Dry chirpine	Leaf litter, Timber, Livestock, NTFP, Habitat for Biodiversity, Carbon sink	Communities, DoL, CoRRB, DoA, DoF, IPCC, NRDC, Woodbased Industry

### **Group 2: Development Policy Makers and Planners:**

Development policy makers and planners identified their interest in the ecosystems as Conservation and sustainable utilization. The stakeholders were identified as (in order of importance) as local communities, national csos, business communities and the donors.

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<sup>8</sup> Department of Energy

<sup>9</sup> Department of Tourism

<sup>10</sup> Department of Forests

<sup>11</sup> Department of Agriculture

<sup>12</sup> Council of RNR research, Bhutan

<sup>13</sup> International Panel for Climate Change

<sup>14</sup> Department of Livestock

<sup>15</sup> National Biodiversity Center

<sup>16</sup> National Institute of Traditional Medicine

<sup>17</sup> National Resources Development Corporation



<b>Development Policy Makers and Planners:</b>	
<b>Questions</b>	<b>All Ecosystem</b>
What is your stake or interest?	Conservation and sustainable utilization
Any other stakeholders? Rank them.	1. Local communities 2. National CSOs 3. Business community 4. Donors
What interest would they have in the ecosystem?	1. Livelihood 2. ensuring resource benefits go to communities 3. commercial 4. conservation/access to genetic resources

### **Group 3: Resource Managers**

#### Alpine

Ecosystem chosen (brief description of location, scale importance etc.)	
Stakeholders	Interest
Community	Grazing, collection of medicinal and aromatic plants, agriculture (limited scale)
Department of Forest	Resource conservation and management, Catchment protection, CBNRM,
NITM	Resource use and product development
Business based on alpine resources	Resource use and product development
Agriculture Marketing Services	Facilitating enterprises, Income generation
Dzongkhag/geog	Facilitating enterprises, Income generation, livelihood development, Sustainable resource management, CBNRM
Research and Extension (MoA)	livelihood development, Sustainable resource management,
Department of Tourism/ tour operators	Tourism-management of eco-trails and camp sites.

#### Temperate Conifer

Ecosystem chosen (brief description of location, scale importance etc.)	
Stakeholders	Interest
Community	Grazing, collection of timber and fuelwood and other forest products (NTFP), agriculture (major scale)
Department of Forest	Resource conservation and management, Catchment protection, facilitating CBNRM or Community forestry
Wood based industries/NRDC	Resource use (timber, sand, stone), FMU
Agriculture Marketing Services	Facilitating enterprises, Income generation
Dzongkhag/geog	Facilitating enterprises, Income generation, livelihood development, Sustainable resource management
Research and Extension (MoA)	livelihood development, Sustainable resource management
Department of Tourism/ tour operators	Tourism-management of eco-trails and camp sites.



## Broadleaf forest

Ecosystem chosen (brief description of location, scale importance etc.)	
Stakeholders	Interest
Community	Grazing, collection of timber and fuelwood and other forest products (NTFP), agriculture (major scale)
Department of Forest	Resource conservation and management, Catchment protection, facilitating CBNRM or Community forestry
Wood based industries/NRDC	Resource use (timber, sand, stone), FMU
Agriculture Marketing Services	Facilitating enterprises, Income generation
Dzongkhag/geog	Facilitating enterprises, Income generation, livelihood development, Sustainable resource management
Research and Extension (MoA)	livelihood development, Sustainable resource management
Department of Tourism/ tour operators	Tourism-management of eco-trails and camp sites.

## Dry Chirpine Ecosystem

Ecosystem chosen (brief description of location, scale importance etc.)	
Stakeholders	Interest
Community	Grazing, collection of timber and fuelwood and other forest products (NTFP), agriculture (major scale)
Department of Forest	Resource conservation and management, Catchment protection, facilitating CBNRM or Community forestry
Wood based industries/NRDC	Resource use (timber, sand, stone), FMU
Agriculture Marketing Services	Facilitating enterprises, Income generation
Dzongkhag/geog	Facilitating enterprises, Income generation, livelihood development, Sustainable resource management
Research and Extension (MoA)	livelihood development, Sustainable resource management
National Environment Commission	Catchment protection, watershed management, river basin management, Environmental Policy, Environmental clearance
Department of Tourism/ tour operators	Tourism-management of eco-trails, wildlife safari, camp and ecotourism sites.

## Freshwater and wetland

Ecosystem chosen (brief description of location, scale importance etc.)	
Stakeholders	Interest
Community	Protection of water sources for drinking/irrigation
Department of Forest	Catchment protection, watershed management, river basin management
Department of Energy	Hydro-power generation and marketing
Dzongkhag/geog	



Research and Extension (MoA)	Research and development, Irrigation
Department of Public Health	Rural water supply
National Environment Commission	Catchment protection, watershed management, river basin management, Environmental Policy, Environmental clearance
Department of Tourism/ tour operators	Tourism boating, white water rafting, fishing

#### **Group 4: Civil Society Organization**

Ecosystem chosen (brief description  
Alpine Ecosystem

Stakeholders in descending order of importance	Stake in the Ecosystem/Interests
Local level	
Highlanders	Source of livelihood (food, fibre, shelter, cash income) livestock grazing, NTFP (Cordyceps, incense, medicinal plants)
	Cultural ties (religious monument, abode for local deities)
National level	
Tourism Industry	Recreation, Revenue,
National Disaster Management Division (MOHCA)	Insure protection from GLOF
MOA	
DOF	Protection of watershed, endemic/endangered species, facilitate and regulate access to biodiversity, ensure benefit sharing mechanisms, measures to ease human wildlife conflict
AMS	marketing
CORBB	Research on biodiversity
Livestock	Livestock services (animal healthcare/pasture)
Ministry of Health	traditional medicinal herbs and minerals including processing
Hydropower Corporations	Must collaborate with MOA on protection of catchment areas, status of GLOF with MOHCA and Look into the possibility of PES for sustainability
National Security	Ensure border patrolling and prevent cross border encroachment
CSOs	Mobilizing and encouraging local communities to adopt sustainable livelihood programs



### Group 5: Resource Users

Ecosystem chosen (brief description of location, scale importance etc.):resource suers		
Stakeholders (in descending order of importance)	Interests	Stakeholders
1 Alpine Ecosystem	I. Non Timber Forest Products - Medicinal and Aromatic Plants II. Adventure Tourism-trekking, mountaineering, rock climbing III. Source/Origin of Water System	I. Policy makers and planners II. Research and Academia III. Donors IV. Ecosystem Managers V. Corporate sector VI. Civil Society Organisation VII. Media
2 Forest Ecosystem (pine, broadleaf, chirpine, etc )	I. Timber II. Non Timber Forest Products - Medicinal and Aromatic Plants III. Nature Tourism - bird watching, river rafting, etc IV. Socio-cultural and aesthetic values	I. Policy makers and planners II. Research and Academia III. Donors IV. Ecosystem Managers V. Corporate sector VI. Civil Society Organisation VII. Media



**Activity 2:**

Discussions on the valuation of services and livelihood indicators resulted in the matrix as given below. The results of the activity are attached in annexure 3

Ecosystem Type:

Ecosystem Services	Livelihood Indicators									
	Physical Security	Basic materials for good life	Health	Good social relations	Freedom and choice	Income	Well-being	Food security	Vulnerability	Sustainability
Provisioning										
Regulating										
Cultural/Enriching										
Supporting										

Grading: 1 = Not important; 2=Slightly/Indirectly Important; 3=Important but not necessary; 4=Important and necessary; 5 = Very Important/Vital



### Activity 3

This activity investigated the drivers in the ecosystems and their impact pathways. The table below was used as a basis for reference. The groups were mixed and divided.

Ecosystem description) (brief	'Drivers' behind changes in the availability of specific ecosystem services over time.	Impact pathway (driver – changes in institutional arrangements or behavioural incentives – impact on ecosystem services)

The resultant matrices are attached below:



**Group 1: (Activity III, IV & V = DRIVERS + IMPACT PATHWAY + STRATEGIES)**

Ecosystem (brief description)	'Drivers' behind changes in the availability of specific ecosystem services over time.	Impact pathway (driver – changes in institutional arrangements or behavioural incentives –impact on ecosystem services)
Alpine ecosystem (alpine rocky out crops, alpine meadows, rhododendron scrubs)	pastoralist, livestock, tourists, NTFP collectors, natural causes (landslides, pests), climate change	user based rangeland management (pasture development, rotational grazing); livestock management (down size no. cattle heads, possibilities for super brown swiss); develop trekking protocols (littering, use of resources, disturbance to wildlife and natural habitats); adopt sustainable harvesting mechanism and strict monitoring protocols
Temperate conifers (blue pine, fir, spruce, hemlock, juniper)	farmers, pastoralists, livestock, tourists, wood-based industrialists, miners, infrastructure development, agriculture expansion, land use change, man-made forest fires, natural causes (landslides, floods, pests), climate change, invasive species, introduction of alien species, habitat fragmentation and degradation, habitat loss, over harvesting (NTFPs), poaching, pollution (land, air, water),	user based rangeland management (pasture development, rotational grazing); livestock management (down size no. cattle heads, possibilities for super brown swiss); develop trekking protocols (littering, use of resources, disturbance to wildlife and natural habitats); adopt sustainable harvesting mechanism and strict monitoring protocols; implement Environmental Impact Assessment, participatory research, planning, implementation, monitoring and evaluation, watershed/river basin level planning, mainstreaming sustainable land management, efficient forest fire management, faithful implementation of polluter pay principle, management of invasive species, prohibit introduction of alien species (fodder & ornamental), land swapping, physical demarcation and management of biological corridors, payment for environmental services, faithful law enforcement
Broad leaf forests (deciduous & evergreen broadleaf forests types)		
Dry chirpine ecosystem (chirpine)		
Fresh waters and wetlands (open lakes, snow covered areas, glaciers, rivers, streams, marshlands)	industries (affluences), municipalities, farmers (agriculture, pesticides, herbicides), land use change, climate change, tourism industry, hydropower projects, alien & invasive species, infrastructure development	develop water policy, institutionalize water act and subsequent regulation



## Group 2

<b>Ecosystem (brief description)</b>	<b>Drivers</b>	<b>Impact pathway</b>	<b>Policy Response</b>	<b>Approach to ecosystems management/Capacity building</b>
Alpine	Over grazing, over exploitation of resources, Pollution	Decline in cattle herds, decline in biodiversity thereby leading to decline in income	Revise Forest and Nature Conservation Act 2005 Formulate Pasture Policy	Eco-tourism Awareness campaign and training on sustainable management of resources
Temperate Conifer	over exploitation of resources, economic development (roads, electrification, chemical fertilizers and pesticides), Rural timber allotment Policy on improving crop productivity, forest fire	decline in biodiversity (flora and fauna) Deforestation Soil erosion Drying up of water sources Degradation of water quality, air quality	Revise Forest and Nature Conservation Act 1995  Need for clear industrial policy	Organic farming CBNRM Land management Integrated pest management Awareness on forest fire/Controlled burning Community and private forestry Carbon sequestration
Broadleaf	over exploitation of resources, economic development (roads, electrification,	Decline in biodiversity (flora and fauna) Deforestation Soil erosion Drying up of water sources Degradation of water quality, air quality	Revise Forest and Nature Conservation Act 1995  Need for clear industrial policy	Organic farming CBNRM Land management Integrated pest management Community and private forestry Carbon sequestration Research on sustainable management of broad leaf forest
Chirpine	over exploitation of resources, economic development (roads, electrification, forest fire	Decline in biodiversity (flora and fauna) Deforestation Soil erosion Drying up of water sources Degradation of water quality, air quality Organic farming CBNRM Land management Integrated pest management	Revise Forest and Nature Conservation Act 1995  Need for clear industrial policy Organic farming framework	Land management Integrated pest management Awareness on forest fire/Controlled burning Community and private forestry Carbon sequestration



<b>Ecosystem (brief description)</b>	<b>Drivers</b>	<b>Impact pathway</b>	<b>Policy Response</b>	<b>Approach to ecosystems management/Capacity building</b>
Freshwater and wetland	Climate change Hydro power Chemical pesticides and fertilizers Economic development/Infrastructure development	Flash floods Soil erosion Glacial lake outburst – flash floods Water pollution – decline in aquatic life Disturbance in migratory pattern of aquatic life Decline in forest cover Decline in fresh water sources Changes in land use pattern	Water Act Water policy Wetland (paddy fields) conservation	Druk Green Power Corporation to plough back certain percent of revenue generated for watershed management  Networking and collaboration with International Panel for Climate Change (IPCC)



### Group 3

<b>Ecosystem (brief description)</b>	<b>“Drivers” behind changes in the availability of specific ecosystem services over time</b>	<b>Impact pathway(driver-changes in institutional arrangements or behavioral incentives-impact on ecosystem services)</b>	<b>Policy response and coping strategies</b>
Alpine	1.Yak herders/farmers 2.Government agencies 3.Tourism 4.Climate change	1.Yak-Overgrazing-loss of biodiversity-land degradation 2.Infrastructure development 3.Socio-cultural changes, over utilization of resources 4.Change in weather pattern, species composition	1.New land act 2.five year dev. plans 3.tourism guidelines/ecotourism strategy,etc. 4. National adaptation programme of action on climate change/NEC.
Temperate Conifer	1.Communities 2.Infrastructure development 3.Government	1.resource utilization(timber, fuelwood, NWFP, etc) 2. unsustainable utilization of forest, encroachment into forest land 3.policies obstructing sustainable utilization/enhancing sustainable utilization	1.New land act 2.five year dev. plans 3.tourism guidelines/ecotourism strategy,etc.
Broad Leaf Forests	1. Communities 2.Infrastructure development 3.Government	1.resource utilization(timber, fuelwood, NWFP, etc) 2. unsustainable utilization of forest, encroachment into forest land 3.policies obstructing sustainable utilization/enhancing sustainable utilization	1.New land act 2.five year dev. plans 3.tourism guidelines/ecotourism strategy,etc.
Dry Chirpine Ecosystem	1. Communities 2.Infrastructure development 3.Government	1.resource utilization(timber, fuelwood, NWFP, etc) 2. unsustainable utilization of forest, encroachment into forest land 3.policies obstructing sustainable utilization/enhancing sustainable utilization	1.New land act 2.five year dev. plans 3.tourism guidelines/ecotourism strategy,etc. 4. National adaptation programme of action on climate change/NEC.
Freshwater and wetlands	1. Communities 2.Infrastructure development 3.climate change	1.pollution of water resources, 1.improper water use and management 2. regulation of water courses, effects on quality and quantity 3.increasing temperature, melting glaciers, flow regulations, GLOFS, etc	1. 2.water policy, draft water act, apex institution appointed 3.national adaptation programme of action (NEC)



## Poverty situation in Bhutan

Ecosystems are important for alleviation of poverty especially in Bhutan given that by definition most of the poor in Bhutan are directly reliant on the ecosystems. Harvest from forests, fisheries and farm produce are an important source of income for the rural poor all over the world. Ecosystems and their optimized use can be a wealth creating asset for the poor and needs to be fully tapped. There is a strong link between the ecosystems and poverty alleviation. Ecologists and economists, policy makers and manager/users need to work together to ensure that economic development incorporates principles of ecological responsibility. Making wise choices in the use of natural resources and the distribution of its benefits to ensure that development is both well balanced and widespread. Development needs to be both social and economic. Rural poor societies also need to be involved in the decision making process when it comes to allocation and use of natural resources.

The country specific definition defines poverty as a person with annual per capita expenditure is less than Nu. 9,000. By this definition about 32% of the populations live below the poverty line and incidence of poverty is 38% as against 4% in urban areas. In terms of regional distribution of poverty, eastern region has the highest incidence of poverty, western region has the lowest and central region is in between the two. Of the total agricultural land only 21% are cultivable and if we take from the total land area, the actual cultivable land is 7.8%. Over 79% of the populations live in rural areas and since agriculture is the main economic activity in rural areas, poverty in Bhutan is mostly a rural phenomenon with concentration in agriculture.

The way forward could take the following process:

- a) Make inventory of natural resources
- b) Set up guidelines for use of these resources
- c) Create economic opportunities in rural areas by providing skill development opportunities, road, telecommunication and market infrastructure
- d) Where possible add value on marketable produce
- e) Increase productivity of agriculture by introducing better methods in production, processing and marketing;
- f) Encourage export of organic agricultural produce;
- g) Encourage community based resource management
- h) Sustainable harvest and export of low volume high value non timber forestry products such as cane, bamboo, mushroom, herbal medicines, essential oil
- i) Establish intersectoral and inter regional backward and forward linkages and coordination (between rural and urban areas, between agricultural and industrial sector and between related agencies)
- j) Promote non agriculture based service or products such as community based tourism

## Development of tourism

Tourism is one of the niche products. Given the stable political and security situation with serene natural and cultural settings Bhutan has, tourism is one of the niche products of products and there is need to develop tourism facilities in different parts of the country. By doing so not only Bhutan can earn more foreign exchange by increasing the number of tourists but also distribute these earnings to other regions thereby bring about balanced economic development which is an important pillar of Gross National Happiness. It is to be noted that while developing the tourism industry local resources should be utilized as much as possible so that some portion of earnings remain with the actual producers of goods and services.



## Annexure 1:

In order to conduct the activities we had the workshop in two phases. Phase 1 was the formal workshop inaugurated by Dasho Paljor Dorji. Below is a list of invited participants. Some members were absent due to unavoidable reasons. (I've noted attendees and absentees in the last column)

Phase 2 was conducted with religious representatives as religion plays a vital role in all matters in Bhutan. We conducted this phase separately from the main workshop as the viewpoints of these participants were not based on technical criteria but on religious perspectives. The outcome of these discussions are attached in a minor paper – Buddhism and the Ecosystem.

Pictures to be attached separately.

### List of Participants For Workshop – Phase 1

Sl. No	Name	Qualification	Designation	Category	Attended
1	Dr. Pema Wangda	PhD Forest Ecology	Program Officer, RNR-RC Yusipang, Ministry of Agriculture (MOA)	Research and Academia	Yes
2	Ugyen Dorjee	Ethno-Biology	Asst. Project Director, MAP Phase II. Ministry of Agriculture	Resource User	Yes
3	A.Karma Rinzin	M.Sc. Agriculture Systems	Head, Information and Management, PPD, MoA	Policy	Yes
4	Kezang Lhamo	BSc. Environmental Science	Dzongkhag (District) Environmental Officer, Ministry of Home and Cultural Affairs. Thimphu	Resource Manager	Yes
5	Chuki Wangchuk	MSc. Natural Resources Management and Policy	Program Officer, Bhutan Trust Fund	Donor	Yes
6	Karma Galey	Diploma in Animal Husbandry	Land Resource Officer, Department of Agriculture, MoA	Research and Academia	Yes
7	Sonam Lhundrup	LLM	Senior Legal Officer, PPD, MoA	Civil Society	Yes
8	Kinzang Choden	BSc. Forestry	Research Officer, RNR-RC Yusipang, MoA	Research and Academia	Yes
9	Pema Wangdi	MBA	General Manager, Bhutan Development Financial Corporation ( BDFC)	Corporate / donor	Yes
10	Sherub	MSc. Wild Life Ecology	Nature Conservation Division	Research and Academia	Yes
11	Chado Tshering	MSc. Forest Science	Joint Director, Social Forestry Division, DoF, MoA	Resource Manager	Yes
12	Chhimi Yuden	BA	Tourism Officer, Department of Tourism	Resource User	Yes
13	Dophu Dukpa	MSc. Agriculture Systems	Senior Planning Officer, PPD, MoA	Resource Manager	Yes
14	Karma C. Nyedrup	MSc In Natural Resource Management MPhil in Environmental planning	Deputy Director National Environment Commission	Policy	Yes



Sl. No	Name	Qualification	Designation	Category	Attended
15	Karma L. Rapten	MSc In Environment Management	Deputy Chief Environmental Officer National Environment Commission	Policy	Yes
16	<b>Lama</b> Kuenzang		Jangsa Animal Saving Trust	Religious and Civil society	No, due to religious reasons
17	Tshering Lham-Tshok	Masters in Community Development and Conservation	Royal Society for Protection of Nature	Civil Society / Media	Yes
18	Tandin Dorji		Historian Bhutan Times	Media	No, due to work deadlines
19	Kuenga Dorji Tenzin		Freelance Journalist	Media	No, due to work deadlines
20	Nidup Penjore		Project Manager, Decentralised Natural Resource Management Project.	Donor	No, out of station
21	Chado Tenzin		FAO, Bhutan	Donor	No, out of station
22.	Tshering Dorji	Environmental Engineer	Bhutan Power Corporation	Corporate	No, out of station
23	Manjusha Rai	MSc In Social Policy,	Dhuen Khen Drup Services (Resource Centre)	Civil Society /Media	Yes
24.	Soe Gup		Village Headman of Soe area	Resource User	No, village duties
25.	Mewang Gyeltshen		Head, Rural Electrification Division, Department of Energy	Corporate Sector	No, due to work duties
26	Tshering Yangden	MSc Environmental Management		ESPASSA	Yes
27.	Nyima Om			ESPASSA	Yes
28.	Pemma Chomo	Masters in History	Historian at the Institute of Language and Culture	Media	No-Attended Phase 2
29.	<b>Dasho</b> Paljor Dorji			ESPASSA	Yes
30	Eveline Vogler		RNR Yusipang	Resource User	Yes
31	Karma Yangzom	MSc in Environmental Management	Bio Bhutan ( a private company that deals with organic products)	Resource User	Yes, Deputed Mr. Sharma to attend on her behalf
32	Dorji Rinchen	Masters in Forestry	Consultant (Ex- district forest officer) presently working with NEC	Research and Academia	Yes



## Workshop Program- Phase 2

Sl. No.	Name	Qualification	Designation	Category	Attended
1.	Tshering Yangden	MSc Environmental Management	ESPASSA	Facilitator	Yes
2.	<b>Khenpo</b> Tshering Gyeltshen	Masters in Buddhist Philosophy	Lecturer in Philosophy Institute of Language and Culture	Religion	Yes
3.	Nyima Om		ESPASSA	Facilitator	Yes
4.	Pemma Chomo	Masters in Public History and Heritage	Historian at the Institute of Language and Culture	Media	Yes
5.	<b>Lopen</b> Pema Khandu	Advanced Buddhist studies	Lecturer in Philosophy Institute of Language and Culture	Religion	Yes
6.	<b>Lopen</b> Sangay Dorji	Advanced Buddhist studies	Lecturer in History Institute of Language and Culture	Religion	Yes



## **Annexure 2**

### **Ecosystem Classification and Mapping**

Our work on ecosystem modeling and mapping using GIS models is the first of its kind carried out for Bhutan. Our work attempts to describe the ecosystems present in Bhutan prior to human development. Hence, the ecosystem coverage's we calculated overestimated what occurs currently. Quantitative field investigation of both flora and fauna would enable better characterization and delineation of ecosystem types. Freshwater and wetland habitats are highly under-represented in our model owing to difficulties in interpreting forested wetlands from satellite images, minimum mapping unit and deficiencies in the land cover map of Bhutan.

Ecosystem modeling and mapping for Bhutan could be further improved upon availability of more recent landuse/landcover data, digital elevation model with better resolution (smaller contour intervals), more complete data on precipitation and temperature, better sub-strata geology layer and digital soil layer.

#### **1. Subtropical Scrubs and Grasslands Ecosystem**

This ecosystem includes mesic as well as dry subtropical scrubs and grasslands. It is characterized by short as well as tall grass species and scrubs. It is highly scattered, fragmented and small in total area. It has a total area of 249 kilometers, consisting of 756 patches. Altitudinally, it ranges from 150-1950 meters, from alluvial flood plains of Gelephu to the rugged dry short grasslands and scrubs of Drangme Chu, Kuri Chu and Punatsang Chu valleys. The maximum temperature ranges from 24-39°C and minimum temperature ranges from -2-6°C. It receives an annual rainfall ranging from 56-389cm. Substrata geology is characterized of siwaliks, dangling-shumar group, baxa group and diklai boulder beds (Gansser, 1995)

#### **2. Subtropical Moist Broadleaf Forests Ecosystem**

This ecosystem is spatially restricted to the lower foothills of the country. It lies in a geologically dynamic belt, resulting from tectonic movements of the Indian Plate against the Tibetan Plate. Numerous faults, thrusts and landslides are visible (Gansser, 1995). Sub-surface geology is characterized of siwaliks, dangling-shumar group, baxa group and diklai boulder beds. The climate is characterized by maximum annual temperatures range of 33-37°C, and minimum annual temperatures of 0-11°C. It receives an annual rainfall ranging from 100-380cm. Elevation ranges from 150-900 meters above sea level. It has a total area of 3365 square kilometers, distributed over 173 patches. It is composed of evergreen, semi-evergreen and deciduous broadleaf forest types, and forms a direct connection to subtropical forests of the Indian plains of the Bramaputra Basin.

#### **3. Warm Broadleaf Forests Ecosystem**

Warm Broadleaf Forests Ecosystem is a mid-elevation ecosystem type of the Himalayan broadleaf forests. It is characterized by sub-strata geology of baxa group, siwaliks, chekha group, tethys, Thimphu-sela group, dangling-shumar group, gondawana group and leucocratic rocks (Gansser, 1995). Climatic features of the ecosystem are : maximum annual temperatures from 20-32°C, minimum annual temperatures from -2 to 8°C, and annual precipitation from 98-389cm. The vegetation plant communities are stratified along elevation, as this ecosystem ranges from 900-2150meters. It is the largest ecosystem by coverage. It has a total area of 8560 square kilometers, with a total of 412 patches.

#### **4. Cool Broadleaf Forests Ecosystem**

The Cool Broadleaf Forests Ecosystem forms a transition ecosystem between temperate conifers of higher elevation and broadleaf forests of lower elevation. Geologically characterized



by sub-surface bedrocks of Thimphu-sela, chekha and dangling-shumar groups, tethys, metamorphosed tectonic silver, granite leucocratic rocks and limestone, the cool broadleaf ecosystem encompasses diverse substrata geology. Climatic features include a maximum annual temperature range from 24-28°C, minimum annual temperatures from -10 to -1°C, and annual rainfall of 129-383cm. This ecosystem covers an area of 5940 square kilometers and is composed of 286 patches distributed from 2150 meters to over 2900 meters.

#### 5. Subtropical Dry Chirpine Ecosystem

Chirpine forests of dry river valleys form a unique xeric ecosystem. This ecosystem is distributed in the valleys of Punatsang Chu, Mangde Chu, Drangme Chu and Kuri Chu. It has been overlooked as a habitat with little biodiversity significance, but it is proving otherwise. Its sub-surface geology is characterized by Thimphu-sela, cheka and baxa groups and granite leucocratic rocks. The subtropical dry chirpine ecosystem is characterized by high temperature and low rainfall influenced by the rain shadow affect of the mountain ranges of the middle Himalayas. The maximum annual temperature range from 24-39 ° C and the minimum annual temperature ranges from -2 to 6°C. Chirpine forests occur from 900 meters to over 2000 meters of elevation. This ecosystem encompasses the hottest places of the country. It covers an area of 1141 square kilometers and is composed of 172 patches.

#### 6. Temperate Dry Conifers Ecosystem

Temperate dry conifers ecosystem is a mid-elevation, dry, upland valley conifer forests characterized by sub-surface geology of Thimphu-sela, dangling-shumar, chekha and baxa groups, tethys, limestone and granite rocks (Gassner, 1995). The maximum annual temperature ranges from 21-31 ° C and the minimum annual temperature ranges from -9 to 0°C, and the annual precipitation ranges from 100-130 cm. It has coverage of 3181 square kilometers with 758 patches extending from lower than 2100 meters of elevation to over 3100 meters.

#### 7. Temperate Moist Conifers Ecosystem

Temperate Moist Conifers Ecosystem is composed of wetter habitat types than the temperate dry conifers ecosystem. It is characterized by Thimphu-sela, chekha, dangling-shumar, and baxa groups, limestone fossiliferous tethyan and highly metamorphosed tectonic sliver rocks. Climatic features of temperate moist conifers are a maximum annual temperature range from 25-29 ° C, a minimum annual temperature ranges from -8 to -13°C, and an annual rainfall of 55-132 cm. It has a total area of 4622 square kilometers with 758 patches distributed over an elevation range of 3100-3800 meters.

#### 8. Subalpine Temperate Conifers Ecosystem

Subalpine temperate conifers are a transition ecosystem between higher and colder alpine and lower and cooler temperate ecosystem. Sub-surface geology is characterized by Thimphu-sela, cheka groups, limestone, fossiliferous tethyan and granite leucocratic rocks types (Gassner, 1995). The maximum annual temperature ranges from 8-18° C and the minimum annual temperature ranges from -8 to 8°C, and the annual rainfall ranges from 58-73 cm. It has an area of 1867 square kilometers with 1499 patches distributed from 3800 to over 4200 meters of elevation.

#### 9. Temperate Scrub Forests Ecosystems

The temperate scrub forests ecosystem is composed of dry short stature shrub lands and scrub forests associated with grasses. They are found in areas naturally degraded or areas degraded from human impact. Sub-surface geology of the ecosystem is characterized by Thimphu-sela, cheka, dangling-shumar, and baxa groups, limestone, tethys and granite



leucocratic rocks. A maximum annual temperature range of 24-39° C, a minimum annual temperature range of -2 to 6°C, and annual precipitation range of 56-380 cm are climatic variables which influence the ecosystem. It covers an area of 1376 square kilometers with 1532 patches distributed within an altitudinal range of 1950-4200 meters.

#### 10. Temperate Meadows and Grasslands Ecosystem

Temperate meadows and grasslands ecosystem is composed of large patches of herbaceous glades and open grasslands within broadleaf and temperate conifer forests. Sub-surface geology is characterized of Thimphu-sela, cheka and baxa and dangling-shumar groups, limestone and fossiliferous tethyan rocks. It receives an average annual rainfall ranging from 70-120 cm; maximum annual temperature varies from 24-39 ° C and the minimum annual temperature ranges from -2 to 6°C. This ecosystem is the most fragmented ecosystem type having an area of 879 square kilometers with 2504 patches, distributed from 1950-4200 meters of elevation.

#### 11. Alpine Scrub Forest Ecosystem

Dwarf rhododendron and rhododendron shrub lands, dwarf juniper, berberis and willow shrub habitat types compose the alpine scrub forest ecosystem. Bedrock geology of this ecosystem is characterized by Thimphu-sela, cheka, dangling-shumar groups, limestone and granite leucocratic rocks. It receives an average annual rainfall ranging from 58-73cm, and snow is a significant part of the precipitation. The maximum annual temperature ranges from 8-18 ° C and minimum annual temperature ranges from -8 to 8°C. Alpine scrub forest ecosystem has an area of 1735 square kilometers with 855 patches distributed above 4200 meters and below exposed rocks and permanent snow cover.

#### 12. Alpine Meadows and Grasslands Ecosystem

Alpine open herbaceous meadows and open grasslands of alpine pasture habitats (Noltie, 2000) are characteristics of alpine meadow and grasslands ecosystem. Sub-surface geology is characterized by chekha, Thimphu-sela groups and fossiliferous tethyan and granite leucocratic rocks. It receives an average annual rainfall of 58-73 cm, and snow fall in winter months is a significant form of precipitation. It is characterized by a maximum annual temperature range from 8-18 ° C and the minimum annual temperature range of -8 to 8°C. It covers 629 square kilometers with a total of 397 patches distributed above 4200 meters.

#### 13. Freshwater and Wetlands Ecosystem

Dendritic networks of rivers and streams, open waters of alpine lakes, marshes and swamps, forest wetlands constitute the freshwater ecosystem. Rivers and streams flow from north to south and traverse the country, and open water lakes are scattered. The freshwater and wetland ecosystem can be associated with almost all sub-surface geology found in the country, namely Thimphu-sela, cheka and baxa, dangling-shumar groups, limestone, fossiliferous tethyan, granite leucocratic and highly metamorphosed tectonic silver rocks. However, surficial geology at the river beds and banks is exposed conglomerate of rounded and smoothened boulders and pebbles of the underlying geology. Shingles of river banks filled with smaller pebbles, coarse and fine sand particles of underlying rock and weathered particles of distant rocks. The freshwater and wetland ecosystem receives an annual rainfall of 55-389cm. The water temperature at lower elevations measures 20.6° C , measured at 1560 meters and water temperature in alpine lakes is -3°C measured at 5100 meters (Bruce, 1997). It has an area of 322 square kilometers with a total of 2063 patches distributed across the country.



#### 14. Others

“Others” ecosystem include exposed surfaces of bedrock and permanently snow covered mountains and glaciers. There is diverse underlying geology, namely Thimphu-sela, cheka, dangling-shumar and baxa groups limestone, tethys, granite leucocratic and highly metamorphosed tectonic silver rocks and siwaliks. The ecosystem is characterized by very extreme climatic features. Temperatures range from permanently sub-freezing of snow covers to hot surfaces of exposed rocks of chirpine forests. Annual rainfall ranges from 55-389 cm. It has an area of 5944 square kilometers with a total of 1820 patches distributed across the country.

Extracted from

‘Using Habitat Models to Predict the Distribution of Birds in Bhutan:  
Implications for Future Research and Conservation’

By Sherub

A thesis submitted in partial fulfillment of the requirement for the degree of

Master of Science

(Wildlife Ecology)

at the University of Wisconsin-Madison (2004)



### Annexure 3

#### Group 1: Donors

Ecosystem Type: All (Donors)

Ecosystem Services	Livelihood Indicators									
	Physical Security	Basic materials for good life	Health	Good social relations	Freedom and choice	Income	Well-being	Food security	Vulnerability	Sustainability
<b>Provisioning</b>										
Food	5	5	5	4	3	4	5	5	5	5
Fibre	4	4	5	4	3	3	4	4	4	3
Fresh Water	5	5	5	4	2	4	5	5	5	5
Fuel Wood	5	5	4	3	4	4	5	5	5	5
Timber	5	5	5	4	4	5	4	5	5	5
Bio Products	5	5	5	4	5	5	4	5	4	4
<b>Regulating</b>										
Climate	5	5	5	5	4	5	5	5	5	4
Water Regulation & Purification	5	5	5	5	4	5	5	5	5	5
Disease	5	5	5	5	4	5	5	5	5	5
<b>Cultural/Enriching</b>										
Spiritual and religious	5	5	5	4	4	3	3	3	4	4
Recreation and Tourism	4	4	4	3	3	5	3	4	3	3
Aesthetic values	4	4	4	3	3	5	3	4	3	3
Cultural heritage	4	4	3	4	4	4	4	3	3	5
<b>Supporting</b>										
Soil formations	4	3	4	3	3	3	4	4	5	4
Nutrient cycling	5	5	4	3	4	5	5	5	4	3
Primary production	5	5	5	4	5	5	5	5	5	4

Grading: 1 = Not important; 2=Slightly/Indirectly Important; 3=Important but not necessary; 4=Important and necessary; 5 = Very Important/Vital



## Group 2: Resource Managers

Ecosystem Type: Temperate, Broadleaf and Dry Chirpine (Managers)

Ecosystem Services	Livelihood Indicators									
	Physical Security	Basic materials for good life	Health	Good social relations	Freedom and choice	Income	Well-being	Food security	Vulnerability	Sustainability
<b>Provisioning</b>										
Crop	5	5	5	5	4	5	5	5	5	1
Livestock	5	3	5	5	5	4	5	4	4	1
NTFP	4	3	4	5	4	4	4	3	5	5
Timber	5	4	3	5	4	3	3	1	5	5
Wood fuel	5	4	3	5	3	3	3	2	5	5
<b>Regulating</b>										
Erosion	2	2	1	3	2	5	1	5	5	5
Air Quality	2	2	4	3	2	1	1	1	1	1
Climate	4	4	4	3	2	5	1	5	5	2
Water	5	5	5	5	4	5	1	5	5	1
Pest	3	1	1	3	1	4	1	4	4	2
Natural Hazard	4	3	4	5	2	1	1	1	1	1
<b>Cultural/Enriching</b>										
Spiritual and religious	5	5	5	5	1	1	4	2	4	2
Aesthetic	4	4	1	1	1	1	3	2	4	2
Social	5	3	1	5	1	4	4	5	5	5
Recreation	3	3	1	1	1	1	2	1	1	1
<b>Supporting</b>										
Nutrient	3	3	4	1	1	3	3	4	5	5
Carbon Sequestration	3	3	5	1	1	4	3	3	1	1

Grading: 1 = Not important; 2=Slightly/Indirectly Important; 3=Important but not necessary; 4=Important and necessary; 5 = Very Important/Vital



Ecosystem Type: Fresh Water (Managers)

Ecosystem Services	Livelihood Indicators									
	Physical Security	Basic materials for good life	Health	Good social relations	Freedom and choice	Income	Well-being	Food security	Vulnerability	Sustainability
<b>Provisioning</b>										
Aquaculture	2	3	4	2	2	2	2	2	1	1
Fresh Water	5	5	5	5	5	5	5	5	5	4
Genetic Resources	5	1	1	1	1	1	2	4	5	5
<b>Regulating</b>										
Erosion	2	3	3	2	1	3	4	4	5	4
Water Purification	5	5	5	1	1	2	3	3	3	3
Disease Regulations	5	3	5	1	1	2	3	4	3	3
Climate Regulations	5	4	3	1	1	2	2	3	3	2
Natural Hazard	5	4	5	4	1	5	4	5	5	2
<b>Cultural/Enriching</b>										
Social	5	2	1	4	3	2	1	1	1	1
Recreational and Tourism	4	3	1	3	3	4	3	2	1	3
Aesthetic	5	4	1	3	3	3	3	1	1	2
Spiritual	5	4	3	3	3	3	3	1	1	1
<b>Supporting</b>										

Grading: 1 = Not important; 2=Slightly/Indirectly Important; 3=Important but not necessary; 4=Important and necessary; 5 = Very Important/Vital



Ecosystem Type: Alpine (Managers)

Ecosystem Services	Livelihood Indicators									
	Physical Security	Basic materials for good life	Health	Good social relations	Freedom and choice	Income	Well-being	Food security	Vulnerability	Sustainability
<b>Provisioning</b>										
Livestock	5	5	5	4	3	5	5	5	5	5
Medicinal & Aromatic Plants	5	4	5	4	4	5	5	3	5	5
Fresh Water	5	5	5	4	3	4	5	2	1	1
<b>Regulating</b>										
Erosion Regulations	5	5	1	1	1	5	4	2	3	3
Natural Hazard (glacial break)	5	5	1	1	1	5	4	2	5	3
<b>Cultural/Enriching</b>										
Spiritual and religious	5	1	5	5	1	1	4	1	1	1
Recreation and Tourism	1	1	1	5	3	1	3	1	1	1
Aesthetic values	1	1	1	5	3	4	1	1	1	1
<b>Supporting</b>										

Grading: 1 = Not important; 2=Slightly/Indirectly Important; 3=Important but not necessary; 4=Important and necessary; 5 = Very Important/Vital



Group 3: Research and Academia

Ecosystem Type: Broad leaved Forest Ecosystem (Research and Academia)

Ecosystem Services	Livelihood Indicators									
	Physical Security	Basic materials for good life	Health	Good social relations	Freedom and choice	Income	Well-being	Food security	Vulnerability	Sustainability
<b>Provisioning</b>										
Food	4	4	4	3	4	4	3	5	5	5
Fibre	5	4	3	4	4	4	3	4	4	4
Freshwater	4	3	5	4	4	4	4	5	4	4
Bio chemicals	4	3	3	3	4	3	3	4	3	3
Genetic resources	4	3	3	3	3	3	3	3	4	3
<b>Regulating</b>										
Air Quality	5	4	4	3	4	3	4	4	5	5
Erosion	5	3	4	4	4	3	4	5	4	4
Climate Regulation	5	3	4	4	4	4	5	4	5	5
Water Purification	4	4	4	4	3	3	4	4	4	4
Disease and Pest	3	3	3	4	4	3	4	4	3	4
Pollination	4	3	3	3	4	4	4	5	4	4
<b>Cultural/Enriching</b>										
Spiritual and religious	3	3	3	4	3	3	4	3	3	3
Knowledge systems	3	2	3	4	2	2	3	3	3	3
Educational values	3	3	2	3	2	3	3	3	3	2
Aesthetic Values	2	3	2	3	2	4	4	2	2	2
<b>Supporting</b>										
Soil formations	4	3	4	3	3	3	3	5	4	4
Nutrient cycling	5	4	3	3	3	3	3	5	4	4
Primary production	5	4	3	3	4	4	3	4	4	5
Carbon sequestration	4	4	4	3	4	4	4	3	5	4



Ecosystem Type: Fresh Water and Wetland Ecosystem (Research and Academia)

Ecosystem Services	Livelihood Indicators									
	Physical Security	Basic materials for good life	Health	Good social relations	Freedom and choice	Income	Well-being	Food security	Vulnerability	Sustainability
<b>Provisioning</b>										
Food	4	4	4	4	3	4	5	4	3	5
Fibre	3	3	3	3	3	3	3	3	3	4
Freshwater	5	5	5	5	4	4	4	4	3	4
Bio chemicals	3	3	2	2	3	3	3	3	2	3
Genetic resources	4	2	2	2	2	3	3	3	2	2
<b>Regulating</b>										
Air Quality	4	5	5	4	4	3	4	4	4	5
Erosion	4	4	5	4	4	4	4	4	4	4
Climate Regulation	5	5	5	4	4	4	5	4	4	5
Water Purification	4	4	4	3	3	3	4	4	3	4
Disease and Pest	3	4	4	2	3	3	4	4	3	4
Pollination	2	2	2	2	2	2	2	4	3	4
<b>Cultural/Enriching</b>										
Spiritual and religious	5	5	4	4	4	3	4	3	3	3
Knowledge systems	4	4	4	4	4	3	3	4	3	3
Educational values	4	4	4	3	4	3	3	3	3	3
Inspiration	3	3	3	3	3	2	2	2	2	2
Aesthetic Values	4	4	3	3	3	4	3	3	3	3
<b>Supporting</b>										
Soil formations	4	4	3	2	3	3	4	3	4	4
Nutrient cycling	3	4	3	3	3	3	3	3	4	4
Primary production	3	3	3	3	3	3	3	3	4	4
Carbon sequestration	4	4	4	4	4	4	4	4	4	5

Grading: 1 = Not important; 2=Slightly/Indirectly Important; 3=Important but not necessary; 4=Important and necessary; 5 = Very Important/Vital Grading: 1 = Not important; 2=Slightly/Indirectly Important; 3=Important but not necessary; 4=Important and necessary; 5 = Very Important/Vital



Ecosystem Type: Alpine Ecosystem (Research and Academia)

Ecosystem Services	Livelihood Indicators									
	Physical Security	Basic materials for good life	Health	Good social relations	Freedom and choice	Income	Well-being	Food security	Vulnerability	Sustainability
<b>Provisioning</b>										
Food	4	4	4	3	2	4	4	3	4	5
Fibre	3	4	4	4	2	2	4	2	4	5
Freshwater	3	3	3	3	3	3	3	2	2	4
Bio chemicals	4	4	4	4	3	1	1	1	4	3
Genetic resources	5	5	2	3	4	1	1	1	5	3
<b>Regulating</b>										
Air Quality	3	3	3	3	2	1	3	1	2	3
Erosion	4	4	3	2	2	2	3	2	4	3
Climate Regulation	3	5	3	3	3	2	4	3	3	3
Water Purification	1	2	2	2	2	2	2	2	2	2
Disease and Pest	1	1	1	1	1	1	1	1	1	1
Pollination	2	2	2	2	2	2	3	3	2	1
<b>Cultural/Enriching</b>										
Spiritual and religious	3	3	4	3	3	1	3	1	3	3
Knowledge systems	3	4	3	4	4	3	3	2	4	3
Educational values	4	3	3	4	4	2	4	2	3	3
Inspiration	3	3	3	3	3	3	2	2	2	3
Aesthetic Values	3	3	3	3	3	3	2	2	2	3
<b>Supporting</b>										
Soil formations	3	4	4	2	3	2	2	3	3	2
Nutrient cycling	3	4	4	2	2	2	2	3	3	2
Primary production	2	3	4	3	3	2	3	4	4	2
Carbon sequestration	4	4	4	3	3	2	3	4	4	2

Grading: 1 = Not important; 2=Slightly/Indirectly Important; 3=Important but not necessary; 4=Important and necessary; 5 = Very Important/Vital



#### Group 4: Resource Users

Ecosystem Type: All (Resource users)

Ecosystem Services	Livelihood Indicators									
	Physical Security	Basic materials for good life	Health	Good social relations	Freedom and choice	Income	Well-being	Food security	Vulnerability	Sustainability
<b>Provisioning</b>										
Food	5	5	4	3	1	5	4	5	5	4
Fibre	3	3	3	1	1	5	5	1	3	4
Freshwater	4	4	5	3	1	5	4	3	5	3
Bio chemicals	1	2	5	2	1	4	5	2	1	5
Genetic resources	2	1	1	1	1	4	3	1	1	1
<b>Regulating</b>										
Erosion Regulations	4	3	1	1	1	1	1	3	4	3
Climate	5	3	4	1	1	3	4	5	5	4
Natural Hazard	3	4	4	1	2	3	3	4	4	4
Pollination	1	4	2	1	1	3	2	4	3	2
Diseases regulations	2	5	5	3	1	3	4	3	4	2
<b>Cultural/Enriching</b>										
Spiritual and religious	4	3	3	4	2	2	2	2	3	1
Recreation and Tourism	4	4	2	4	2	5	3	3	1	5
Aesthetic values	3	2	3	3	3	4	3	2	2	4
Educational Values	5	5	4	3	3	2	3	3	1	3
Social relations	4	4	3	5	2	3	4	2	1	2
<b>Supporting</b>										
Soil formations	4	5	2	2	1	4	2	3	2	4
Nutrient cycling	3	5	4	3	2	1	2	4	3	4
Primary production	5	5	2	1	1	3	2	4	3	4
Carbon sequestration	2	2	4	3	1	2	5	4	4	4

Grading: 1 = Not important; 2=Slightly/Indirectly Important; 3=Important but not necessary; 4=Important and necessary; 5 = Very Important/Vital



Group 5: Policy Makers

Ecosystem Type: All

Ecosystem Services	Livelihood Indicators									
	Physical Security	Basic materials for good life	Health	Good social relations	Freedom and choice	Income	Well-being	Food security	Vulnerability	Sustainability
<b>Provisioning</b>										
Food	5	3	4	1	1	2	5	5	4	4
Fiber	4	3	4	1	1	4	4	4	3	3
Fresh water	5	5	5	2	1	4	4	4	4	4
Bio-chemicals	3	2	4	1	1	4	4	3	3	3
Genetic resources	1	3	4	1	1	4	3	4	3	3
<b>Regulating</b>										
Air quality regulation	4	5	5	4	1	1	5	4	5	5
Erosion regulation	4	4	2	1	1	4	4	5	4	4
Climate regulation	4	4	4	1	1	3	4	5	5	4
Water purification	4	4	5	1	1	2	4	4	4	4
Disease regulation	4	4	5	3	1	2	5	2	4	4
Pest regulation	2	3	4	2	1	4	4	4	3	4
Pollination	2	2	1	1	1	4	1	5	3	3
Natural hazard regulation	5	4	3	1	1	3	3	4	4	4
<b>Cultural/Enriching</b>										
Spiritual and religious values	1	1	1	3	1	1	3	1	1	1
Knowledge systems	1	3	3	3	1	3	3	3	3	3
Educational values	1	3	3	3	1	3	3	3	3	3



Ecosystem Services	Livelihood Indicators									
	Physical Security	Basic materials for good life	Health	Good social relations	Freedom and choice	Income	Well-being	Food security	Vulnerability	Sustainability
Inspiration	2	2	2	2	1	1	2	1	1	1
Aesthetic value	1	1	1	1	1	2	1	1	1	1
Social relations	1	1	1	5	1	1	2	1	2	2
Sense of place	2	1	3	3	1	1	3	1	1	1
Recreation and tourism	1	1	1	1	1	4	3	2	1	1
<b>Supporting</b>										
Soil formation	1	4	2	1	1	4	4	4	4	4
Nutrient cycling	1	4	2	1	1	4	4	4	4	4
Primary production	2	4	4	1	1	4	4	5	4	4
Carbon sequestration	2	1	4	1	1	2	3	3	3	3

Grading: 1 = Not important; 2=Slightly/Indirectly Important; 3=Important but not necessary; 4=Important and necessary; 5 = Very Important/Vital







**ESPA Stakeholder Workshop for India:**

**21<sup>st</sup>-22<sup>nd</sup> December, 2007**

**A Summary Note of Proceedings**

**Organizers: TERI, IUCN-India, TERI University**

## **Project sponsors**

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**BRAC, BANGLADESH**



## Workshop Agenda

### Workshop Outcomes:

The country workshops are intended to contribute to the ESPA study by bringing together a focus group of stakeholder representatives for discussion on the following key issues:

6. What are ecosystem services and how do they contribute to poverty alleviation?
7. What are the trends in the state of ecosystems and how has this affected the availability of different ecosystem services over time and across space?
8. What are the major drivers (direct and indirect) to account for the changing availability of ecosystem services over time and across space? How have global-level drivers contributed to local-level changes in the availability of ecosystem services? Which are the policy-related drivers that have turned out to be most influential at different ecosystem scales?
9. What has been the impact of the changing availability of ecosystem services on the poor and how has the latter coped?
10. What has been the policy response to changing availability of ecosystem services and to what extent it has been effective in addressing the poverty-related consequences of such changes?

**In each of the sessions of the workshop, the focus will be on identifying knowledge gaps with respect to ecosystem management, specifically for poverty alleviation purpose, and possible mechanisms for capacity-building.**

### Day 1 : Friday, 21st December, 2007

**Venue: India Habitat Centre (Banquet Hall, The Deck – 5<sup>th</sup> Floor)**

**9.00–9.30 a.m. Registration**

#### **Session 1**

**9.30–10.30 a.m. Welcome and Introduction**

*Chair: Dr Leena Srivastava, Executive Director, TERI*

- **9.30-9.45: Welcome by Leena Srivastava & self-introductions by participants**
- **9.45-10.15: ESPA Project overview & key research issues**
- **10.15-10.30: Discussion**



**10.30-11.00 a.m.**

**Group Photograph followed by Tea**

**Session 2**

**11.00 a.m -1.00 p.m.**

**Experience sharing on Ecosystem management, Poverty alleviation and Public policy (Country situations)**

*Chair: Sri Chandi Prasad Bhatt, Dasholi Gram Swrajya Mandal*

**Sharing of experiences by participants**

- **11.00-11.30: Sri Chandi Prasad Bhatt**
- **11.30-12.00: Dr. Chetan Aggarwal**
- **12.00-12.30: Dr. Ajit Pattnaik**
- **12.30-1.00: Discussion**

**1.00 -2.00 p.m.**

**Lunch**

**Session 3**

**2.00 – 5.30 p.m.**

**Formation of Groups to discuss the issues 1-5 identified under workshop outcomes in page 1**

- **2.00-2.15: Group formation**
- **2.15-3.15: Breakaway groups discuss Q1:**  
Ecosystems, ecosystem services and their contribution to poverty alleviation

**3.15 -3.45 p.m.**

**Tea**

- **3.45 -4.45: Breakaway groups discuss Q2 & Q3:**  
Trends and Drivers
- **4.45 - 5.30: Presentations by the group**

**Day 2 : Saturday, 22<sup>nd</sup> December, 2007**

**Session 4**

**9.30 -12.30 a.m**

**Group discussions continue**

- **9.30 – 10.30: Breakaway groups discuss Q4:**  
Impacts on poor and their coping strategies

**10.30 -10.45 a.m.**

**Tea**

- **10.45 – 11.45: Breakaway groups discuss Q5: Policy responses (top-down & bottom-up)**
- **11.45 – 12.30: Presentations by groups**

**Session 5**

**12.30 – 1.00 p.m**

**Concluding session**

*Chair: Professor Murthy, Institute of Economic Growth*

**1.00 -2.00 p.m.**

**Lunch**



Name of the Participant	Stakeholder category	Organization	E-mail
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## Summary note

The following sections present a summing-up of the inputs received from different stakeholder representatives in the Delhi workshop. While the workshop was actually organized around focused discussions by stakeholder groups, the interesting outcome was not so much in contradiction or conflict of 'group views' but rather more of complementing inputs from every group. Accordingly, the following report is not aiming at presenting viewpoints group-wise but rather as a synthesis note.

Sections 1 to 5 present the perceptions of participants regarding the 5 issues spelled out in the workshop agenda. Sections 6 and 7 contain the knowledge gaps and capacity needs identified in the workshop and the final part of this report contain summaries of the case studies contributed by participants.

### 1. Ecosystems and ecosystem services

Ecosystems are *naturally defined areas* that generate a flow of goods and services over time. Human beings who sustain on an ecosystem are also a part of it. Examples of the products received from ecosystems include tangibles such as groundwater, NTFPs, wild animals, plants, birds, minerals, soils, surface water, clean air, medicinal plants, timber, bamboo and cane, seeds, fishes, jutes, silt & sand, foods etc. and intangible services such as bio-diversity, nutrient cycle, hydrological cycle, eco-tourism, clean air, cultural and spiritual values/aesthetic values etc.

Different ecosystems provide different services to the local community and the major ecosystems are: Deserts: hot and cold; Mountains; Coasts; Wetlands; Forest; and Grassland. Classification of ecosystem services can be either MA-based (provisioning, regulating, supportive, cultural & spiritual) or scale-based (local, regional, national, global).

Ecosystem services are *processes* in the ecosystem and some of the benefits humans derive are not apparent at first. For example, the agricultural belt near the Monash National Park in North East has a very high productivity of vegetables and Assam gets all its vegetable supply from this area. Though it might not be apparent at first the ground water level is very high and the soil is fertile because of the presence of the National park.

The ecosystems and services provided thereof are site-specific and depend on the unique human-ecosystem interaction on that particular ecosystem or site. For example, *sal* trees in the forests of Sahdol district in Madhya Pradesh are considered by some village communities as family trees and worshipped; however, in nearby areas the nomads (Banzaras, Gujjars) do not observe such tradition and do not derive any spiritual or cultural values from the same forest.

Ecosystems and ecosystem services are increasingly receiving attention from policymakers because, first, these natural systems and the flows of their services are inextricably and often irreplaceably linked to human needs in varying spatial contexts; and, second, there is growing certainty regarding their vulnerabilities to climate change and other anthropogenic pressures. Ecosystems often have huge relevance for the local people of that region given their dependence on it, not only in economic sense, but also on account of their very deep interaction with local culture and religion.

### 2. Trends and drivers

In general, all ecosystems are getting degraded and globalization is increasing the vulnerability of natural resources. Poor are more critically affected in case of ecosystem degradation and the impacts are aggravated because of market and governance failures.



A major cause of environmental degradation is market failure and conservation can be more successful if market captures the worth of individual ecosystem services.

Apart from direct drivers which impact the bio-geo physical aspect of the ecosystems, the indirect drivers of ecosystem change include population growth, economic development and trade, developmental activities, inappropriate policy, lack of inter sectoral coordination, lack of valuation of ecosystem services, lack of awareness & capacity building, lack of trust, breakdown of traditional and community institutions, market failure, and commercial pressure.

Big infrastructure projects such as construction of big dams and mining projects are among the major drivers of ecosystem change. Loopholes in law and ineffective/wrong policy implementation carry catastrophic future implications (e.g. removal of barrier in checking the trucks loaded with forest products in Chhatisgarh despite opposition by local people). Natural disasters such as floods, forest fires and droughts also play important roles as drivers. Increased urban demand, rise of consumerism, corruption, power politics, population increase, globalisation, commercialisation and marketisation (e.g. *bhui neems*, *Palash flowers* and *shikakai*) are also contributing to changes in ecosystems. Increased mining and quarrying activities are adversely impacting the forests and water resources. Temporary deployment of para-military camps in the forests is contributing to the deforestation.

It is not that there are always only flip sides of the picture; positive initiatives taken by the NGO's, community groups and government have in some way started improving the existing situation of the eco-system in some regions. A particular example is the development of eco-friendly techniques for using ecosystem products (e.g. scientific ways of collecting honey, fuel-efficient *chullahs*, micro-watersheds, etc).

### **3. Ecosystem-poverty links**

Ecosystem services benefit both poor and non-poor. Poverty needs to be properly defined and all aspects other than income (access to natural resources, health, social relations, self-esteem, community institutions, traditional knowledge, and cultural/spiritual values) need to be considered. Poverty is about (lack of) access to natural resources also: poor are the ones with less access to resources like water, land, and forest and pay more heavily when these resources are degraded.

Cultures define values for resources and local conceptions of poverty or richness are important in understanding poverty-ecosystem links. There is the example of 'ownership of beehives' being perceived as richness by certain communities. Communities' sovereignty over food is also an important factor in the context of food security.

Ecosystem degradation affects the livelihood of the people dependent on it and an immediate effect in most cases is either change in profession (e.g. from artisans to wage labourers) or out migration from the area (leading to rootlessness or social deprivation). These are coping strategies adopted by the poor in response to ecosystem degradation. In many cases the migration undertaken as a response to degraded ecosystem becomes permanent and the migrants are unable to come back to their ancestral land. This type of migration lowers the self esteem of the poor; they feel alienated and rootless away from their land and traditional livelihood (example of fishermen of Chilika migrating to Maharashtra and working as wage labourers in the cement factories since last 15 years abandoning traditional occupation).

### **4. Ecosystem management for poverty alleviation**

Policy making is still to a large extent ecologically illiterate. A blanket approach to policymaking often misses out on the epistemology of the science underlying ecosystems and ecosystem services. For example, the social forestry program based on monocultures has a focus typically on isolated components without taking into account the inter-linkages. Slogans like-"Plant more trees" and "Save every drop of water wherever it falls" are glaring



examples of a blanket approach to policymaking. On the same vein, while *ex-situ* cultivation needs to be promoted in the interest of conservation, it needs to be emphasized that it is species specific.

Policy formulation and implementation is a consultative process and needs to be inclusive. For decision making in conservation, a bottom up approach always requires appropriate validation before it receives sanction from the government (e.g. the NBSAP experience in India).

There are many examples of top-down planning in government policies that have resulted in policy failures. For example, poaching of lions increased when villagers around the Gir forest were relocated because poachers no longer had to worry about local opposition.

Inappropriate policies have also contributed to exacerbated conflicts between people, government, and environment. Environmental problems cannot be seen in isolation from socio-economic problems because they are interlinked to environmental security, conflicts for resources in the local community.

Participatory planning with proper implementation of the existing policies and programmes is essential for poverty eradication. Government policies often miss concerns/apprehensions at the community level. For example, an apprehension is growing among the people that government may put restrictions on harvesting timber on the private land around protected areas in future. This had led to fewer tree farming. There are instances of wrong propaganda as well, such as that related to the plantation of the *Jatropha* in Chhatisgarh and Madhya Pradesh (publicized as “*disel nahi ab khadi se, ab milega baadi se*”).

There is also the fact that there is a gap between policy and practice. While policy statements emphasize that people living in the surrounding area of an eco-system are integrally associated with that eco-system, the government officials' approach towards the local people still tend to be exclusionary in many parts of the country.

There are communities who are against any kind of external policy interventions. They believe that any kind of external policy intervention is harmful not only for the conservation of the eco-system but also for the well-being of the local people and its traditional institutions.

The successful restoration of Chilika Lake illustrates that it is possible to achieve conservation while meeting the livelihood needs of the local community. More than 0.2 million people are dependent on the Chilika lake ecosystem for their livelihood and 0.8 million people inhabit in the same watershed area. Chilika is a complex ecosystem and degradation of the lake resulted in low productivity of fish and shrimp (1600MT in 1999 from 9000MT earlier). Scientific studies, hydrological modelling, and stakeholder consultation were conducted simultaneously to find a way to save the lake from degradation. The lake was linked with the sea again as recommended by the scientific study and local community. Fish productivity increased eight times within one year of restoration. The current fish production in a year is sufficient to finance the entire cost on restoration of the lake over ten years. Even the people who were not dependent on the lake for livelihood like agriculturists were educated about the benefit of the lake and provided adequate government support like crop insurance.

People can be motivated to conserve and protect the ecosystem once they are aware of the role of ecosystem and ecosystem services in their life. In the Chilika lake, for instance, there used to be intensive fishing near the bird sanctuary area inside the lake because of higher fish productivity in that area, but in the process the migratory birds were getting disturbed. The bird droppings were the reason fish came to the nutrient rich water and that was the reason why fish productivity was higher inside the sanctuary. A consultative process (characterized by much conflict) between the government and the local fisherfolk resulted in a mutually beneficial outcome in which the sanctuary got a clearly demarcated area and the fishermen agreed to restrict their operations outside the sanctuary area.



Revival of traditional institutions and indigenous knowledge, and systematic collection, value addition and knowledge of market about the ecosystem products and services can go a long way in alleviating the poverty of the people. Community based eco-tourism has great potential for providing livelihood to local people, but it faces the danger of being marginalized by commercial tourism. Creation of private incentives and effective markets can encourage local community's participation in ecosystem conservation.

Markets can play an important role in the use of ecosystem services for poverty alleviation. The cultivation of *tendu* for its leaves for *beedi* manufacture is an example of market-led encouragement. However lack of education as well as control systems can contribute to unhealthy competition and result in negative outcomes.



## 5. A Stakeholder Matrix

Stakeholders	Influence	Policy response of different stakeholders to environmental degradation
Government	<ul style="list-style-type: none"> <li>– Compensation to affected people</li> <li>– Generating alternative employment opportunities</li> <li>– Encouraging informal regulations</li> <li>– Capacity building</li> </ul>	<ul style="list-style-type: none"> <li>– Conservation (legislations)</li> <li>– Rehabilitation, resettlement</li> <li>– Procurement policies</li> <li>– Market policies</li> <li>– Technology</li> <li>– Promoting people's participation</li> <li>– Using instruments for market efficiency and resource management</li> <li>– Promoting awareness and capacity building</li> <li>– Monitoring and enforcement</li> <li>– Institutes for local people to distribute benefits to local people (Co-operative societies)</li> <li>– IPR to be with local people</li> <li>– Green taxes/ subsidies</li> <li>– Participation in international agreements and treaties to deal with global externalities arising out of ecosystem management</li> <li>– Green accounting</li> </ul>
Civil society	<ul style="list-style-type: none"> <li>– Raising funds from public and international community</li> <li>– Highlighting magnitude of the problem</li> <li>– Capacity building</li> <li>– Influencing government policies</li> <li>– Providing cheap alternatives to cope</li> </ul>	<ul style="list-style-type: none"> <li>– Informal regulation</li> <li>– Public Interest Litigation</li> <li>– Awareness and environmental education, disseminating knowledge and information</li> <li>– People's co-operatives to capture the value of eco-products</li> <li>– Common property rights management</li> <li>– Community participation</li> <li>– Conflict resolution</li> </ul>
Private sector	<ul style="list-style-type: none"> <li>– Resource support : Monetary; Infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>– Innovations in technological development and resource management</li> <li>– Use of efficient technology</li> <li>– Incentives to produce green products</li> <li>– Voluntary contribution (Corporate Social Responsibility)</li> <li>– Resource conservation (recycle, reuse)</li> </ul>

## 6. Knowledge gaps

- Knowledge gaps persist in the identification of the whole range of ecosystem services (e.g. waste assimilation) and in valuing the impacts of even known services. There is a need for creating capacity in bringing about trans-disciplinary rigor in research for understanding ecosystem linkages with society.



- b) Grassroots research on ecosystem-poverty links is necessary for customisation of livelihood packages (leading to greater community acceptance) but still inadequate.
- c) Often people are unaware of the worth of ecosystems and more empirical research can address this knowledge gap at the community level. For instance, the nomads from Rajasthan settled in Shivapur district in MP extract grass, firewood and occasionally timber for making rafts from the forest but never realized the importance of the contribution of the forest till they were told that the total amount of grass they extract from the forest in a year alone has a market value of Rs.75,000.
- d) Success stories are very often taken as examples for future programs. It is important to ascertain to what extent they were successful by proper analysis of the criteria and the indicators. Similarly, in case of failures, rarely there is follow-up identification of the causal factors and their redressal.
- e) Data needs are huge and extremely varied in ecosystem management; consequently there is a need to identify priority areas and at the same time set standards of data quality. There is also a mismatch in data collection and reporting (restricted to administrative boundaries) and inadequate validation of ethnological knowledge (e.g. medicinal herbs).

## **7. Capacity needs**

- a) Technology application in ecosystem management need to be encouraged and an example of this is radioisotope-based identification of infiltration zones in watersheds which helps in the monitoring of watershed services and helps in prioritising areas for management. However, any single technology has its limitations (e.g. failure of satellite data to distinguish between forest area and plantation, between forest cover and forest quality, etc) and hence there is a need for identifying appropriate complementing techniques/methods.
- b) Data related capacity can be strengthened through common platforms for data sharing and integrated databases (e.g. ATREE's eco-informatics). For generating data, protocols (e.g. people biodiversity registers) need to be developed for involving local people in participatory ecosystem monitoring and social audits.
- c) There is no need to re-invent networks for building management capacity but rather synergies between various government and non-government programmes need to be promoted. The livelihood programs of GEF, FAO (e.g. Livelihood and livestock program), BCRLIP (Biodiversity Conservation through Rural Livelihoods Program) and UNDP deserve attention. Apart from these, much can be learnt from the outreach programs of major NGOs (e.g. DA's Poorest Areas Civil Societies program, TERI's INSTEP, ATREE's PRM program and also its program on forest rights and conservation methods and WII) involving capacity creation based on local resources and monitoring by local people (e.g. ATREE's water watch program which focuses on reducing poverty through mitigation of adverse impacts on Kerala's backwater because of ecotourism).
- d) Poverty co-exists with very little awareness (and misperceptions) about rights and entitlements. Capacity building and awareness programmes can help people cope up with ecosystem degradation as well as being part of participatory arrangements for ecosystem management. Communities generally find it difficult to conceptualize services as processes and tend to focus on the immediate tangibles. The potential of mass media in this regard is still unexplored. There is definitely a need to build capacity in the media and among journalists who rarely see the ecosystem as a whole and usually focus attention on individual parts.



## **8. Case studies contributed by participants**

### **CASE STUDY- I - LIVELIHOOD PATTERNS AND POSSIBILITIES IN FRINGE AREAS OF IMPORTANT WETLANDS IN ASSAM (INDIA): A CASE STUDY OF FOUR WETLANDS**

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The flood plains of the Brahmaputra River, the Barak River and their tributaries in Assam are full of wetlands (known as *Beels* in local parlance) of different types and sizes. The state has only inland wetlands of both natural and manmade types wherein lakes/ponds, ox-bow lakes/cut-of meanders, waterlogged (seasonal) and swampy/marshy areas are the principal varieties of natural wetlands. Tanks and reservoirs are the main categories in the manmade type of wetland of the state. The state has approximately more than 3500 wetlands of different sizes and types covering area of about 1000 km<sup>2</sup> of the state. Many of these wetlands are ecologically important areas sustaining precious biodiversity, providing crucial ecological goods and services and supporting livelihoods of riparian people living in the fringe areas of these wetlands. This study examines the prevailing patterns of livelihoods and explores the possibilities of enhancing livelihood opportunities of the rural people living in the fringe villages of four ecologically important wetlands in the state viz. the Urapad Beel (Goalpara District), Dhir Beel (Dhubri District), Deepor Beel (Guwahati Metropolitan District) and Samaguri Beel (Nagaon District).

As part of the study profiles of environmental and socio-demographic status of the wetlands and their fringe areas have been prepared. Current livelihood situation around the wetlands with respect to typical livelihoods options exercised, crops grown, yields, livestock reared, annual incomes and expenditure, fishing, income from ancillary activities (e.g. tourism) if any etc. have been studied. Alternative livelihood options that would strengthen household economy and would contribute to sustainable management of environment and natural and contribute to environmental sustainability have been identified from amongst a given set of options such as SRI paddy, fishing intensification at household level, Intensification of backyards, Second crop, Livestock and Orchards etc. The role and performance of Government and non-Government interventions in conservation-based livelihood development have also been examined. The study is based on primary data generated through a household survey of 271 selected families in 28 villages in four districts as well as on secondary information from all available sources.

A significant population in each of the study sites depends on the wetlands' resources and services for their sustenance and livelihoods directly or indirectly. A sizeable population of the riparian people can appreciate the ecological and other values of the wetland and have an opinion in favour of conservation of the wetlands. Conservation and sustainable management of these wetlands can be ensured only if benefits of conservation projects are shared with the local communities. Dissemination of awareness about the ecological benefits of the wetlands is needed for both local people and others (planners, policy makers, politicians etc.) to boost existing favourable attitudes and to sensitize those who are unaware and callous. The dependence of the communities on the resources of the wetlands needs to be minimised even while highlighting the interdependence between the human and natural systems. *Livelihood improvement is the only means through which the communities can be*



*effectively empowered to be protectors and wise users of the wetlands resources and services.*

The livelihood scenario is more or less similar in all the wetland areas in terms of types of existing livelihoods, types of crops, community preferences of livelihoods, irrigation facilities, Government and non-Government interventions etc. But there are differences amongst the study areas in annual income and expenditure, farm costs, community perceptions and expectations of livelihoods as well as livelihood potential. This is because of the differences in demographic situation, existing economic status, location of the areas, proximity to townships and roads.

It was observed that different stakeholders had conflicting and overlapping interests and stakes on the resources of the wetlands which creates dilemma for planners and development workers as regards whether priority is to be given to conservation or development/livelihoods. However, of late the view that conservation and resource use in sustainable way can be pursued simultaneously is gaining currency.

In all the study areas degradation of the Beel ecosystems and over-exploitation of their fish stocks have led to loss of livelihoods for traditional fisher folks leaving them poorer and more marginalised. A significant population of the fringe areas of each of these wetlands (10% to 20%) have suffered from livelihood displacement and are still trying to come to terms with the situation by attempts to take to other temporary professions which can't assure them even of the minimum subsistence needs. In the Deepor Beel area many villagers have suffered miserably because fish catch and productivity of rice have gone down drastically over the years due to over fishing, water pollution, encroachment, siltation and flooding problems.

SRI paddy can be promoted in all these study sites cashing on the assured minimum water content in these perennial wetlands. For majority of the households, resources in the homestead gardens (vegetables, fruits etc.), are used to fulfil family needs only. There are many instances where homeyards with fertile land have been left largely unused even though the families are living in stark poverty. However there have been also quite a few cases where homestead orchards have contributed significantly to family income. There are several notable examples of successful entrepreneurship based on betel nuts (resulting in household production units of supari) in the villages near the Samaguri Beel. Several others have demonstrated the potential of horticulture in backyard orchards. Here is a need to motivate the people to change their mindset and use the homestead gardens as income generating resources.

In the villages of Hirapara and Nowapara in the vicinity of the Deepor Beel, traditional pottery still exists as a major income generating source although this is not adequate for their sustenance and they also have to depend on farming and fishing to some extent. Promoting this skill of these villagers and value adding to it through proper training and marketing can strengthen their economic status considerably. All the wetlands have considerable tourism potential, but the nature tourism holds most imminent possibilities in the Deepor Beel (a Ramsar site and partly a bird sanctuary) and the Samaguri Beel, where ongoing government led-tourism initiatives provide the necessary exposure and infrastructure for community based nature-tourism.

**CASE STUDY- II- Sustainable management of fodder resources by stakeholders collectively towards restoring the balance between livestock, environment and livelihood in VSS and forest fringe villages, Andhra Pradesh, India.**

**Project Update January 2006- July 2007, Centre for People's Forestry, Secunderabad, India**



Rearing of small ruminants is a very important livelihood source even among the forest dependent communities. This is particularly true in parts of Rayalaseema and Telangana in Andhra Pradesh that have highly degraded or semi-degraded fringe forests and income from Non-timber forest produce is very low, thus making the small ruminant rearing a vital livelihood alternative.

Most of these communities rearing small ruminants are generally resource poor and hence depend heavily on the village common property resources (CPR) for fodder. Recent trends however indicate considerable and progressive depletion of grazing lands at the village level owing to land encroachment and also because of the government policies pertaining to re-allocation and distribution of waste lands-thereby making fodder scarcity a prime threat to the sustainability of this livelihood.

Owing to the shrinking CPRs, the small ruminant rearers have adopted to an increased dependence on forest for fodder. The present situation is such, that at any given time the total livestock population (both large and small ruminants), coupled with migratory livestock from neighboring areas, is much more than the net availability and carrying capacity of the existing CPRs and VSS forests put together, thus putting the forest ecosystem under severe stress and accelerating the desertification.

Under such circumstances, the Andhra Pradesh Forest department formed Vana Samrakshana Samithis (VSS) in 1996 to conserve and revive degraded fringe forests as part of the then Joint Forest Management initiative which now is the ongoing Community Forest Management (CFM). While the CFM aims at safeguarding the livelihoods of forest dependent communities, it also restricts grazing in the VSS forests as its primary objective is to conserve and revive degraded fringe forests. These restrictions have thus resulted in the landless communities engaged in small ruminant rearing in losing yet another source of fodder and thereby affecting their livelihood adversely.

The situation now in many areas is such that the VSS considers the large flock sizes of the small ruminants a threat to their forest conservation efforts and the livelihood of the small ruminant rearers is under threat owing to the restrictions of grazing on forest lands. There is thus an urgent and compelling need to strike a balance between forest and livestock based livelihood for land-less poor.

### **CASE STUDY-III - Integrated rural development program, Baiga Check and Amarpur Districts, Dindori, Madhya Pradesh, India.**

**Project Report- January 1998-December 2000, National Institute of Women Child and Youth Development, Nagpur, Maharashtra, India.**

The dense Sal forest covers the Baiga Check area. As the villages are forest, the State Forest department administers these. Baigas (primitive tribe of the area) are closely associated with the forest and are totally dependent on the forest for their day to day needs. Majority of the land in the area is stony, sandy and has very little moisture for a very short period. The major crops are *Kodon*, *Kutki*, *Makka*, etc, which is sufficient only for the period of four months of the year. For the remaining eight months they have to depend on the collection of forest produce, labor work in the forest and loan from the money lenders and mediators. They are exploited both by the forest officials and by the moneylenders. The baigas don't have the permanent ownership of land titles. They have been given temporary land pattas and that too for a short period of 9 years. These land pattas are allocated to only those families who have been allocated land pattas before 1980. There are several other families who have been divided from the original families due to marriage or various other reasons. But they have not been given the temporary land pattas. For their survival they have encroached the land. The forest officials at the local level always dominate these people, sometimes threatening them of the serious. Baigas have always been dependent on



forests as majority of their needs are fulfilled from the forest. The forest officials deprive these tribal of their rights over the forests, not only that they are also forced to compulsory labor.

As the farm produce is hardly sufficient for four to five months and whatever forest produce they collect from the forest is not sufficient enough for the remaining eight months, they have to borrow from the moneylenders and the mediators especially during the rainy season. The Baigas borrow food grains from the lenders in exchange of which they have to return cash crop at the rate of minimum 200% interest. If they do not return the cash crop, their domestic animals, utensils, ornaments etc. are taken away forcibly by the mediators. Many times even after that the original quantity food grains or the money, which the people had borrowed, remained the same and they are caught in the trap of money lenders and mediators.

Health has been the major issue which is the most neglected one in the Baiga Check area. As food deficiency for nearly six months was predominant in the area, the Baigas are deprived of proper nutritious food. Coupled with this they have to go to forest to collect the forest produce to fulfill their day to day needs. This has put an extra pressure on their health. Lack of nutritious diet and ignorance toward health has led to many health problems in the area. Another health problem has been the contaminated water. This has given rise to increased cases of malaria especially during and just after the rainy season. The water sources in the area are not properly maintained. The Health Department of the Government of Madhya Pradesh does not have the adequate machinery to tackle the health problem.

For generations the Baigas have cultivated land around the forest. With the reservation of forests and reservation of forests and establishment of forest villages annexed their agricultural lands. The formal systems of administration are beyond the comprehension of adivasi and the formal administration only understands the written documents which the adivasis are never in possession of. for securing the land title. Their agricultural lands are thus lost with the forest department assuming the control of these.

#### **CASE STUDY-IV - Chipko movement- An example of local community participation in forest conservation**

**Presentation in ESPASA stakeholder workshop- Shri C.P. Bhatt, Dasholi gram swaraiya mandal.**

C. P. Bhatta, an eminent environmental activist, presented a pictorial description of the complex interlinkages between the environment and poverty in Ganga-Brahmaputra-Indus basin of the Himalayan region. He opined that eco-system distortions are not confined within the demarcated political boundaries; rather its effects spill over to other areas as well. Understanding the nuances of this complexity between the environment and poverty is critical in designing the right kind of policy interventions. He also stressed that the eco-system has huge relevance for the local people of that region given their dependence on it, not only economic sense, but also of their very deep interaction in terms of cultural and religious bondage. He expressed his concern for the deterioration of the Himalayan eco-system and resultant poverty in the region. He pointed out some specific eco-system products which were sustaining the livelihood of the local people of this region is gradually being extinct. '**Keeda Jadi**' a special kind of forest product whose economic value is too much was served as a source of income for the local people is becoming less in number. Similarly a very rare flower '**Phen kamal**' is no longer seen in ample amount. He was also quite apprehensive about the glacial melting in the region and its implications for the livelihood of the people. He emphasized the need for including local peoples in the policy making process. Policymaking must be inclusive and take the community concerns into account, he argued. Local people are also gradually being aware about the perceived threats that may arise due to the deterioration of the eco-system of this region.



In this context, Shri Bhatt brought out the glaring example of the famous Chipko or “Embrace the tree” movement to protect forest from commercial felling in the Garhwal region of India. The movement was based on traditional Indian strategy of non co-operation for conflict resolution and was dominated by women. The first Chipko movement action took place in April 1973 when villagers demonstrated against felling of ash trees in Mandal forest. Again in March 1974, 27 women saved a number of trees from the contractors axe. Finally the government yielded to the protest and stopped the contract system and formed the Uttar Pradesh Forest Corporation. During the next five years the Chipko movement took place in several parts of the Garhwal Himalayas and today has become a symbolic strategy for human survival from ecological disaster (Shiva and Bandyopadhyay, 1986).



## Overview of ESPA project

### ESPA Stakeholders Workshop: Background, Issues & an Overview

21 – 22 December 2007  
New Delhi

Organizers: TERI, TERI University, IUCN - India

### Key Issues identified for this Workshop

1. What are ecosystem services and how do they contribute to poverty alleviation?
2. What are the trends in the state of ecosystems and how has this affected the availability of different ecosystem services over time and across space?
3. What are the major drivers (direct and indirect) to account for the changing availability of ecosystem services over time and across space?
4. What has been the impact of the changing availability of ecosystem services on the poor and how has the latter coped?
5. What has been the policy response to changing availability of ecosystem services and to what extent it has been effective in addressing the poverty-related consequences of such changes?

### About the ESPA Project



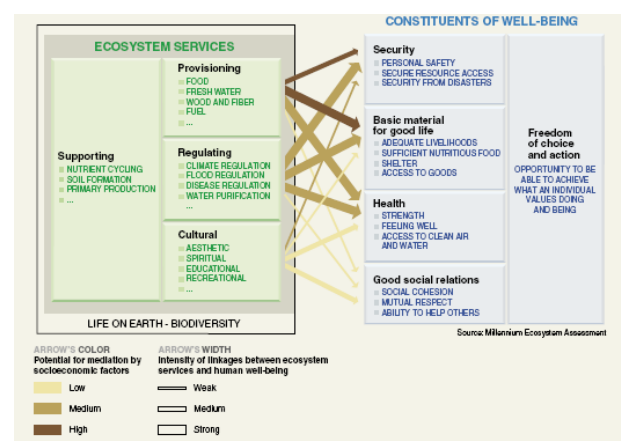
- Collaborative study with regional and UK-based partner organizations
- Duration: August 2007 – February 2008
- Sponsors: NERC, DFID & SERC, all UK-based funding agencies
- Involves a 'situation analysis' of ecosystem services important to the well-being of the poor, including an assessment of information & knowledge needs

### Understanding ecosystems & ecosystem services

- The distinction between ecosystems (natural assets) and their flows (goods and services) is dependent on stakeholder perspectives.
- Classification of the flows (ecosystem services) is important for ecosystem management, but difficult on account of their interlinks and varying scales.
- One approach is to define ecosystem services in terms of their links to human well-being
- In the other approach, flows from ecosystems consist of consumptive goods and ecosystem services that are defined in terms of transformations of energy and mass

### Why this Workshop?

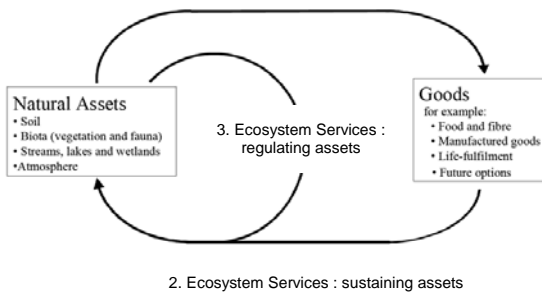
- Interactions between ecosystems and human societies involve multiple actors
- Ecosystems tend to cut across socio-economic, cultural and political boundaries
- Ecosystem services cater to multiple needs, that range from the local to the global
- Consequently, stakeholder perceptions are likely to differ and may be sources of conflict
- Understanding differences in stakeholder perceptions is important for policymaking on ecosystem management





### Ecosystem services and three transformations

1. Ecosystem Services : inputs to production of goods



2. Ecosystem Services : sustaining assets

3. Ecosystem Services : regulating assets

## Changes in ecosystems in India: Some select trends

- During 1993-97, forest cover in all the tribal districts of the country decreased by 5937 sq.km., with the largest decrease recorded in Andhra Pradesh (-3587 sq. km.), and Madhya Pradesh (-2313 sq.km.) – FSI assessment
- Mangroves: area has increased from 4046 sq km in 1987 to 4481 sq km in 2001
- Per capita arable land has declined from 0.9ha in 1950-55 to 0.15 ha in 2000 and predicted to decrease further to 0.08 ha in 2025
- Area under horticulture and plantation crops have increased during 1970-71 to 1995-96(eg. fruits: 110%, sugarcane:69%, coffee: 122%,rubber:150%)

## Links between Ecosystem Services and Poverty

- Poor people use natural resources for satisfying subsistence needs (food, fuel, fresh water, etc)
- Many of the rural poor are dependent on the environment for income generation
- The poor also bear the greater share of the impacts arising out of environmental degradation
  - Disease burden
  - Environmental 'shocks'
  - Quality of life
- Often the poor are excluded/marginalized from institutions designed for ecosystem management

## Changes in ecosystems in India: Some select trends ... *contd.*

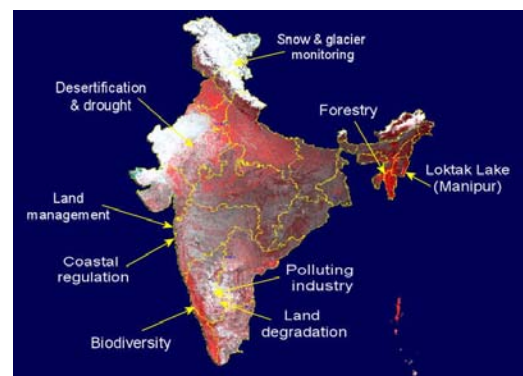
- Habitat loss and fragmentation likely to result in an extinction of over one-third of the estimated 1.5 lakh species of plants and animals in the near future (Gadgil & Meher-Homji, 1990)
- Estuaries and coastal waters suffer more in terms of water quality than physical loss due to growing pollutant loads (e.g. more than 80% loss of live coral cover in some reefs)
- Most of the inland wetlands suffering from pollution and obstruction to the flow
- Deserts, grasslands: no estimates available

## Poverty (Rural) Trends in India

- From 1973-74 to 1999-2000, the percentage of India's poor located in rural areas decreased from 81.3% (26.1 crores) to 74.3% (19.3 crores) [Planning Commission, 2001]
- Poverty ratio (percentage of populations of a state in poverty) significantly high in: Bihar, Orissa, UP, MP, Maharashtra, Assam and WB
- 'Poverty traps' exist at the regional level within these poor states (3 most affected: South Western Madhya Pradesh, Southern U.P., Southern Orissa )
- Non-income measures of poverty are important: e.g.
  - Hunger: In 1993-94, 4.2% of rural households in India had two square meals a day only in some months of the year (Orissa:15%, West Bengal:11%, Bihar:5%, Uttar Pradesh:3%) and 1% not even in some months of the year!! (NSS data)

## Stresses on environment

Source: Kasturirangan, Energy and Resources Institute (TERI), New Delhi





## Drivers (Indirect) of Changes in Ecosystems:

- Population growth: population has grown by 134% during 1951-91; from 1991-92 to 2010 population is expected to increase by another 37% (the Planning Commission)
- Urbanization: urban population is predicted to grow from 28.5% in 2004 to 32% in 2015
- Changing consumption pattern: major increases in household spending on environmental goods
- Scientific and technological progress (e.g. green revolution; GM crops)
- Rapid economic growth; growing international trade; etc
- Role of socio-political and cultural factors

## Community Action

- Many localized examples of successful community action for ecosystem conservation & management (e.g. the Chipko Andolan)
- But concerns persist regarding participation of women, trans-boundary cooperation, support from government agencies, applying modern scientific practices in ecosystem management, etc

## Drivers (Direct) of Changes in Ecosystems:

- Impact of climate change on forests, vegetation and river flows
- Introduction of exotics leading to loss of biodiversity
- Construction of infrastructure (dams, canals, pipelines, roads, defence establishments, etc)
- Illegal activities (poaching, encroachment, overfishing, etc)
- Unregulated tourism
- Dumping of pollutants

## Summing up

- Ecosystem management need to take into account the multi-dimensional and dynamic nature of poverty-environment linkages
- Two fundamental and inter-related challenges in ESPA:
  - The need to manage and sustain long-term capacity of the environment to provide goods and services on which human well-being depends; and
  - The need to ensure secure and equitable access by the poor to environmental assets and the benefits they provide in order to expand people's livelihood opportunities, protect their health and capacity to work, and reduce their vulnerability to environment-related risks

## Public Policy – Major Concerns

- Poverty-environment issues yet to be properly integrated into national development planning
- Wherever taken into consideration, poverty-environment links are generalized and over-simplified
- Empowerment of poor & marginalized groups yet to be achieved in participatory institutional arrangements for ecosystem management
- Weak poverty-environment monitoring and assessment



## **ESPA Stakeholder Workshop for Nepal**

**26th December, 2007**

Hotel Himalaya, Kathmandu

### **A Summary Note of Proceedings**

Organizers: ForestAction, IUCN-Nepal



#### **Project sponsors**

**NERC, ESRC, DFID-UK**

#### **Consortium Partners**

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**IUCN, SRI LANKA**

**SDPI, PAKISTAN**

**BRAC, BANGLADESH**



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# Workshop Agenda

The main objectives of the stakeholder workshop were:

- To provide forum through which dialogue could be established with key organizations/ individuals such as ecosystem managers, policy makers, experts in the field of ecosystem services and poverty.
- To provide the stakeholders with an opportunity to contribute to the situation analyses.
- Dialogues among the stakeholders would result in a more accurate and acceptable report that could be used for policy-making

## Expected Outcomes

In recognition of the knowledge available as well as the information gaps, the expected outcomes of the national workshop were:

- How fulfilling the gaps would contribute to the poverty alleviation?
- How can we fulfill these information and knowledge gaps?
- Is there a scope for capacity building in researching these issues?
- What would be the contribution of such capacity building towards the long-term national and regional development agenda to reduce poverty?

## Schedule for the Workshop

Time	Schedule
08:15-09:00	Registration and breakfast
<b>Session I: Overview of Ecosystem Services and Poverty Alleviation (Chair: Prabhu Bbudhathoki)</b>	
09:00-09:15	Welcome, Introduction
09:15-09:45	Ecosystem services and poverty: Basic concepts and project overview (Bhim Adhikari)
09:45-10:15	Ecosystem service and poverty alleviation: Current situation in Nepal (Prakash Karn)
<b>Session II: Panel Sessions: Experience sharing on ecosystem management, poverty alleviation and public policy process in Nepal (Chair: Dr. Madhav Karki)</b>	
10:15-11:30	<b>Panelists:</b> Mr. Deepak Gyawali, Dr. Kamal Banskota Ms. Apsara Chapagain, Dr. Bhisma Subedi, Dr. Hemant Ojha
11:30-12:00	<b>Teak Break</b>
<b>Session III : Group Work</b>	
<b>Theme I: Ecosystems, human wellbeing and stakeholders</b>	
12:00-13:15	i. identify links between ecosystem services and human being ii. stakeholders and their stakes in specific ecosystem management
13:15-14:15	<b>Lunch Break</b>
<b>Theme II: Drivers of ecosystems change and poverty outcomes</b>	
14:15-15:45	i. Drivers of ecosystem change and poverty outcomes ii. Policy responses, iii. Stakeholders strategies, needs and capacity building strategies
<b>Session III: Presentation, discussion and conclusion (Chair: Dr. Bharat Pokhrel)</b>	
15:45-17:15	Presentation by groups and plenary session
17:15-17:45	Way forward: Opportunities and challenges (Dr. N.S. Jodha)
18:00-20:30	Reception and Dinner



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## Executive Summary

This report provides the content, process and some reflections on the one –day national stakeholder consultation workshop under the project titled, 'Ecosystem Services and Poverty Alleviation Study in South Asia (ESPASSA)'. The stakeholders workshop aimed at (a) providing a forum through which dialogue could be established among key organizations/individuals such as ecosystem managers, policy makers, experts in the field of ecosystem services and poverty, (b) providing the stakeholders with an opportunity to contribute to the situation analyses, and (c) ensuring an accurate and acceptable reporting of the situation in Nepal that could be authentically used for policy-making.

This was one-day workshop with diverse stakeholders including policy level authorities, federations of resource users, civil society, corporate bodies, media, bilateral and international agencies. The first presentation "*Ecosystem Services and Poverty Alleviation Study in South Asia (ESPASSA)*" by Dr. Bhim Adhikari gave some conceptual overview on ecosystem services and its linkages with poverty alleviation, its relevance and processes. This was an introduction on subject matter. The second presentation was made by Prakash Karn, Environmental Economist at IUCN Kathmandu, on "*Ecosystem Services and Poverty Alleviation: Current Situation and Opportunities in Nepal.*" Similarly, panel discussions with open questions/answer made further clarity on how ecosystems services directly and indirectly affect the livelihoods of people. It also elucidated the concept and operational methods of ecosystem services and its linkages with poverty alleviation. Then the participants were divided into 7 groups provided with a facilitator/moderator. Each group had the participants of the same field or discipline for example, resource manager group, resource user group, corporate group, civil society group, academe group, bilateral/INGO group, and media group. Each group was given freedom to select and discuss within group and make presentation based on the guidelines on ecosystem services and poverty alleviation. Six groups discussed on forest ecosystems and only one group (INGOs/Bilateral Agencies) on wetland ecosystems. At last, the each group made presentations and then clarification on presentations.

Each group identified the provisioning services (direct consumable goods and services), regulating services, cultural services and supporting services of both forest ecosystems and wetland ecosystems. They also identified the stakeholders and their interests/stakes. Furthermore, each group also worked out on positive and negative changes, factors/drivers and effect/impact on livelihoods. They also identified the concerned government policies and their effectiveness. At last, they assessed the existing roles, gaps and desirable expectations on both forest ecosystems and wetland ecosystems.

In Nepal, there are forest ecosystems, agro-ecological ecosystems, pasture ecosystems, and wetland ecosystems. Only few studies have been completed on ecosystem services in Nepal, which can be counted in finger tips. The assessment shows that there are two institutional practices on ecosystem services in the country namely: (i) Ecosystem services for Kulekhani hydro-project that community can get fund from the revenue generated by the hydro electricity, and (ii) 30-50% sharing of the revenue to the local community development from the protected areas including national parks, conservation areas, wildlife reserves etc.



Major problems/issues in ecosystem services identified during the workshop are: (a) lack of explicit government policy on ecosystem services, (b) there is no accounting system developed and approved by the government agencies for ecosystem services, (c) lack of awareness to public and most of the stakeholders on ecosystem services, (d) ecosystem services are neither recognized nor institutionalized in the concerned agencies (e) there is lack of research evidences to convince the policy level authority to recognize and institutionalize the ecosystem services.

The country is at preliminary stage on recognizing ecosystem services both at community and policy level, thus, there is an urgent need to make documentations of experiences and practices, campaign advocacy at different level, make public awareness, policy formulations, develop accounting systems and institutionalization of ecosystem in the government organizations and carry out research to promote the ecosystem services.



## Abbreviations and Acronyms

A/R	Afforestation/Reforestation
B.S.	Bikram Sambat
BZ	Buffer Zone
CBD	Convention of Biological Diversity
CDM	Clean Development Mechanism
CF	Community Forest/ry
CFUG	Community Forest User Group
CITES	Convention on International Trade in Endangered Species of Wild Flora & Fauna
DDC	District Development Committee
DFO	District Forest Office/r
DSCO	District Soil Conservation Office/r
DSCWM	Department of Soil Conservation and Watershed Management
EIA	Environmental Impact Assessment
ES	Ecosystem Services
ESPASSA	Ecosystem Services and Poverty Alleviation Study in South Asia
FECOFUN	Federation of Community Forest Users Nepal
FNCCI	Federation of Nepalese Chamber of Commerce and Industry
Govt.	Government
ICIMOD	International Center for Integrated Mountain Development
IEE	Initial Environment Examination
INGO	International Non-Government Organization
IPR	Intellectual Property Rights
IUCN	The World Conservation Union
LSGA	Local Self-Governance Act
MAP	Medicinal and Aromatic Plant
MDG	Millennium Development Goal
MEA	Millennium Ecosystem Assessment
MW	Mega Watt
NBS	Nepal Biodiversity Strategy
NCS	National Conservation Strategy
NEA	Nepal Electricity Authority
NEHHPA	Nepal Herbs & Herbal Products Association
NGO	Non-Government Organization
NP	National Park
NRs	Nepali Rupees (currency)
NTFP	Non-Timber Forest Product
PAs	Protected Areas
PES	Payment for Environment Services
R & D	Research and Development
SIA	Social Impact Assessment
UNFCCC	United Nations Framework Convention on Climate Change
VDC	Village Development Committee (the lowest administrative unit)
WECS	Water and Energy Commission Secretariat



## 1. Ecosystems and Ecosystem Services

An **ecosystem** is a dynamic complex of plant, animal, and microorganism communities and non-living environment interacting as a functional unit (CBD, 1992). Humans are an integral part of ecosystems. Ecosystem varies enormously in size. Example of ecosystems e.g. forest ecosystem, wetland ecosystem, agro-ecological ecosystem, rangeland or grassland ecosystem etc.

**Nepalese ecosystems:** Nepal has altogether 118 ecosystems namely 10 in Terai, 13 in Siwaliks, 52 in midhills, 38 in highlands and 5 others (NBAP, 2000); however its number is still contestable. Broadly, ecosystems of Nepal have been divided into: forest ecosystems, rangeland ecosystems, wetland ecosystems, mountain ecosystems and agro ecosystems. The biological resources of the Terai and Swamlike hills forest ecosystems are mostly dominated by Sal trees (*Shorea robusta*), tropical deciduous reverine forests and tropical evergreen forests. These ecosystems are of internationally importance both in terms of number of globally threatened wildlife and floral species found in them as well as their diversity. The midhills have the greatest diversity of ecosystems (52) and species in Nepal. Nearly 32% of Nepal's forests occur in the midhills. Likewise, there are 38 major ecosystems in the mountains and lowlands because of harsh environmental conditions, they nevertheless characterized by a large number of endemic species (NBS, 2002).

Wetlands have been recognized as one of the important ecosystems that harbor about 25% of the biodiversity of Nepal. Major gaps are: (i) inventory of wetland sites, (ii) lack of integrated wetland management, lack of awareness and community participation. Although IUCN has identified 242 wetland sites in Nepal, biodiversity of these wetlands is, for the most part, still unknown.

**Ecosystem services:** Millennium Ecosystem Assessment (2003) defines the **ecosystem services** are benefits people obtain from ecosystems. They are categorized into: **Provisioning services:** Products obtained from ecosystem e.g. food, fresh water, fuelwood, fiber, biochemicals, and genetic resources. **Regulating services:** Benefits obtained from regulation of ecosystem processes e.g. Climate regulation e.g. floods, Water. regulation, water purification drought, land degradation and disease, detoxification. **Cultural services:** Non-material benefits obtained from ecosystems recreational, spiritual, religious, symbolic, educational, and non-material benefits. **Supporting services:** Services necessary for the production of all other ecosystem services e.g. soil formation, nutrient cycling, primary production

**Potentiality of ecosystem services:** Nepal, basically a hilly and mountainous country, is the second highest potentiality on hydro-electricity with 83,000 MW in the world but only 1.5 of its potentiality has been harnessed with the generation of 557 MW (WECS: Energy Synopsis Report 2006). The country is also identified as one of the 10 destination centers of the world for the tourists trekking and natural scenic view of Himalayas. On the other hand, national parks and conservation areas with high floral and faunal biodiversity are also the hubs for the tourist attraction. The newly opened adventurous white water rafting in the hilly and mountainous rivers, and wetlands (for example, Pokhara Phewa lake, Rara Lake, Shay Phoksundo, Koshi Tappu) are centers for attraction tourists recreation. Nepal is directly benefiting from these ecosystems.



## 2. Trends and Drivers and Poverty Outcomes

Six groups have identified that deforestation or forest degradation is the main driver in forestry sector. The major drivers/factors for the deforestation in Nepalese context are:

**Political interference:** When there were political upheavals in country, the politicians have made it as political agenda giving people to distribute forest lands for settlements. The people's movement in 2036 B.S., and 2046 B.S. and different election period, thousands of hectares of forests were encroached and government could not take any action rather those illegal encroachments were given to the encroachers.

**Rapid population increase:** Average population growth of the country is 2.28 per year which is itself a very high compared to other countries. However, population growth of some districts like Kailali district is approximately 3.9% per and has highest rate of deforestation among all the Terai and hilly districts due to internal migration, freed bonded labour, the Maoist cantonments.

**Commercial exploitation:** In the name of commercial exploitation of forest for different purposes, natural forests of Terai have been heavily exploited without replacing it through plantations.

**Encroachment:** There is both organized and unorganized encroachment of forests in Terai as well as in hills by migrants, bonded labor and those households whose private lands are joined with forest boundary.

**Infrastructure development:** In the name of infrastructure development such as road, electricity extension wire, irrigation canals, dams and establishment of market centers, thousands of hectares of forests have been deforested and converted in other uses without replacing forests in other lands.

**Resettlement commission:** In the name of so-called management of resettlements, many government commissions were formed and they recommended and approved the distribution of forest lands for new settlement. Chitwan valley, Jhapa Jhora settlement, Sarlahi resettlement are some of the examples resettlements.

**Natural hazards:** Many natural hazards such as landslides and floods have deforested thousands of hectares of forests.

**Under pricing of forest production:** Both the government agencies and local people under evaluate the forests as it is growing naturally. They think there is no investment of people or government agencies.



**Irregularity in community forests:** In the community forests of Terai and Inner-Terai, there are many cases of irregularities have been reported by harvesting huge amount of timber and other forest products to make quick money for individual benefits by the authorities of forest user groups and it has negative impact on forests.

**Over grazing:** Grazing is done free of costs in Nepal. The local people also keep animal sheds for grazing inside forests for 4-8 months which has direct negative impact on health of the forests.

**Forest fire:** Forest fire is very common both intentional and unintentional. Intentional forest fire is practiced to get new and tender grasses whereas unintentional fire is occurred when trekkers throw away smoking cigarettes in the forests during dry seasons.

#### **A. Outcomes of deforestation in livelihoods**

The following outcomes of deforestation have been identified in the livelihoods:

**Increased poverty:** Deforestation has caused many unprecedented events such as unexpected flooding, landslides, long drought period, drying spring water, increased invasive species in the productive lands and reduced production of forest products. Thus, poor and local community people have to spend more time to collect the same amount of forest products, which they used to collect in very short period. In Bhabar and Terai, thousands of hectares of productive lands have been destroyed by river-cutting and deposition of silts on productive agricultural lands due to massive destruction of forests in Churia hills. This can be observed in Dhanusha, Siraha and Saptari districts where Churia hills are denuded and downstream peoples are getting poorer than before due to destruction of their agricultural lands. Many of them have become homeless; some have changed their occupation as labour or rikshaw puller due to loss of their agricultural lands.

**Increased Erosion, landslides and loss of top soil:** Due to deforestation, the incidents of landslides have increased; top soil have been washed away by rainwater in the absence of vegetation cover which has direct negative impact on production of agricultural crops and livelihoods of farmers.

**Spring water decline:** In hills, many natural water springs have dried or quantity of water as well as period of water from natural spring is declined due to deforestation in watershed area which has direct bearing on women who are mainly responsible for fetching water. It has also negative impact in the irrigation for cultivation of crops.

**Increased invasive species:** Due to deforestation, many invasive species such Eupatorium and some other invasive weed species have covered the forests which has reduced the production of forest products.

#### **B. Positive Change by Community Forests/Leasehold Forests**



In Nepal, community forests and leasehold forests, which are directly managed by the local community people, have positive changes in the livelihoods, and community development. These program have not only Improved forest cover in managed. The main factors/drivers for positive changes are:

- Favorable community and leasehold forestry policy
- Ownership of forest user groups
- Positive attitudinal change both in forest user groups and forestry staff
- Commitment of forestry staff
- Capacity enhancement of forest technicians
- Recreational demand (ecotourism)
- Pride in achievements (users & staff)
- Collective ownership
- Donor support
- Exposure to democratic governance
- Protection oriented
- Carbon sequestration
- Access to forest products
- Local environment
- Good governance

### **Poverty Outcomes**

The positive outcomes are:

- Investment in rural development by the forest user groups
- Income generation activities for poor
- Social capital building
- Democratic value exercised in the forest user groups
- Positive impact on sanitation by investment by user groups
- Increased literacy & education by investment in education sector
- Improved food security and improved nutrition & health
- Increased and easy availability of forest products
  - NTFPs recognized as major source of income

### **C. Reduction in NTFPs/MAPs**

<b>Drivers/factors</b>	<b>Observed trend</b>	<b>Poverty Outcome</b>
Poverty	<b>Reduction in NTFP</b>	<ul style="list-style-type: none"> <li>- Less herbal medicine</li> <li>- Less tourism</li> <li>- Reduction in cash earning</li> <li>- Destruction in system</li> <li>- Negative impact on livelihoods</li> </ul>
Unclear state policies		
Bureaucracy		
Lack of skill /knowledge/ technology / market		



#### D. Increased flood trend

Drivers/factors	Observed trend	Poverty Outcome
Climate change	<b>Flood increasing</b>	<ul style="list-style-type: none"><li>- Soil erosion and loss of fertility</li><li>- Reduction in agricultural land</li><li>- Reduction in productivity</li><li>- Wash out infrastructures</li><li>- Effect in health</li><li>- Waterborne disease</li><li>- Sanitation problem</li></ul>
Forest area decline		

#### E. Loss of Biodiversity

Drivers/factors	Observed trend	Poverty Outcome
Bio-piracy	<b>Loss of Biodiversity</b>	<ul style="list-style-type: none"><li>- Reduced productivity</li><li>- Reduced availability of fodder/forage</li><li>- Increased coverage of invasive weed species</li><li>- Reduced availability of desired species to fulfill basic needs</li><li>- Reduced availability of food species</li></ul>
Monoculture plantation		
Loss of indigenous knowledge		
Frequent forest fire		
Over-grazing		
Deforestation		
Forest encroachment		

#### F. Observable trends in ecosystem change

The observable trends can be categorized into positive and negative changes.

##### Positive Changes

- NTFPs/production/collection increased in CF
- Increased production of timber from community forests
- Increased greenery in community forests
- Soil conservation in managed watersheds
- Increased in number of wildlife in community forests
- Increased biodiversity in community forests and protected areas
- Ecotourism increased

##### Negative Changes

- Deforestation in Terai region
- Forest degradation in government-managed forests
- Encroachment in government-managed forests
- NTFPs/production/collection decreased in government-managed forests
- Decreased biodiversity in government-managed forests



- Disappearance of water bodies (wetlands)
- Deforestation for infrastructure increased (road, canal, high extension line, industries)
- Increased flooding
- Increased landslides
- Reduction in agriculture production
- Reduction in wildlife population (extinction of few)
- Reduction in livestock population due to lack of grazing lands
- Climate change/global warming
- Reduction in fish production



### 3. Issues on ecosystem change, policy responses and outcomes

SN	Issues on Ecosystem Change	Policy Responses	Effectiveness
1	Private ownership of large area of forests	Private Forest Nationalization Act 1957	- Mixed - Increased conversion of forest into agricultural land
2	Deforestation	Forest Act 1961 Forest Protection (Special Arrangement) Act 1967	- Protection oriented Contradiction between policy and people
3	Massive deforestation	Master Plan for Forestry Sector 1988	People's participation in community forests
4	Deforestation	Forest Act 1993 Forest Regulation 1995	Effective for community Forestry & Leasehold Forestry for poor
5	Loss of NTFPs/MAPs	NTFP Policy 2005	Not implemented
6	Loss of Biodiversity	Nepal Biodiversity Strategy 2002	Partially implemented with the Biodiversity Implementation Plan 2006
7	Increased Landslides Erosion	Soil Conservation Act 1982	Not implemented
8	Poverty Alleviation	10th Plan	Improper implementation of sectoral policies
9	Loss of biodiversity	International conventions: CBD 1992 Ramsar Convention 1971 CITES 1973	- Nepal Biodiversity Strategy 2002 - Declared 4 sites as per Ramsar Convention - CITES listed flora & fauna banned for export
10	Climate change	United Nations Framework Convention on Climate Change (UNFCCC) 1992	Not Effective
11	Big chunk of block forest not managed in Terai	Revised Forestry Sector Policy 2000	Partially implemented in some areas with Collaborative Forest Management in Terai on pilot
12	Degrading forests	Leasehold Forestry Policy 2002	Provisions not yet included in Forest Act 1993
13	Reduced number of fauna (threatened)	Terai Arc Landscape Nepal Strategic Plan 2004	Effective in Terai and Inner Terai districts
14	Shifting cultivation in the forest lands and insecurity of land tenure	Forest Act 1995 Land Reform Act	Only limited to cultivate for short-term crops but not three fruit and tree species
15	Big chunk of forest not managed in Terai	Collaborative forest management Guidelines 2062 B.S.	Controversy between



#### 4 a. Stakeholders and their Interests

SN	Stakeholders	Interests
1	Indigenous peoples (e.g. Majhi)	Survival/ livelihoods
2	Farmers	Irrigation/ drinking water
3	Protected areas	Species / habitat conservation
4	Forest department	Conservation
5	DDC/VDC	Revenue
6	Tourists	Recreation
7	Sportsman	Recreation
8	Researcher	Exploration / knowledge
9	Religious group	Spirituality
10	Irrigation department	Irrigation
11	NEA	Hydropower
12	Drinking water supply board	Drinking water
13	DSCWM	Watershed conservation

#### 4 b. Conflicting Interests with others

**Conflict on boundary DFO and Local government (DDC):** Both DFO and DDC generate revenue from the collection of sands and gravel from river. One conflict with other interests on boundary of the river whether it fall within the territory of the DDC or forestry administration when only one side is forest.

**Conflict between forestry administration and Department of Mining:** In many cases, the Department of Mining issue permission letter for operating mining inside the forest area without taking concurrence from the forestry administration and conflict starts between the interests of two organizations.

**Conflict in the forest management models:** There is a conflict in the model of big chunk of forests in Terai between community forestry versus collaborative forest management. Forestry administration including Ministry of Forests and Soil Conservation and the Department of Forests has conflicting interests for collaborative forest management model in Terai. On the other hand, community forests does not address the forest product needs of far distant users in Terai and considered not suitable model for Terai. This issue was also raised in the panel discussion.

**Community forestry and grazing of transporting herds in Himalayan region:** In western Himalayan region, community forestry user groups have banned grazing inside community forests. On the other hand, those community forests were previously enroute of transporting food items by animals (donkey, mule, horse, sheep and goats). This ban on grazing in community forests has directly hampering on transportation of food security and ultimately in the supply of food items. This issue was also raised during panel discussions.



**Intra-conflict in the management of forest within forest user groups and use of funds for different purposes:** In some community forest, there is an intra-conflict inside the forest user groups for the management of forests. Forests are managed for production of timber, which fulfills the interests of rich people or to be managed to meet the livelihoods of poor people. In many cases, there are conflicts on interests of forest users to spend big funds for community development, which does not address the issue of poor, disadvantaged groups and women.

**Conflict between protected areas administration and local community people:** Since establishment of protected area, there has been conflict between protected area administration and local people as the traditional use rights of indigenous peoples and local people in the forest use have been curtailed after declaration of protected forests (national park, wildlife reserve, buffer zone etc.). With the implementation of buffer zone concept and allocation of 30-50% of revenue for community development, the government is trying to reduce the conflict between protected areas and local community but still there are many conflicts between them.

**Conflict in land-use - forests or other land-use:** Landless and migrated people encroach the valuable forests of Terai zone in an organized manner. Sometimes, hundreds of huts are constructed over night and on the other hand, forestry administration remove all those encroachers by using force.

**Traditional knowledge of indigenous people and local communities:** Due to conflicting interest between Ministry of Forest and Soil Conservation and indigenous peoples on rights of traditional knowledge, the draft bill on Access to Genetic Resources and Benefit Sharing (2002) is pending for last 5years.

**Inconsistent/impractical government policies and legal framework:** Forestry policies and legal framework is conflicting with Local Governance Act, regulation and many other laws and vice-versa.

**Gaps in research findings, recommendations and implementation:** From the action research, many recommendations have been made but they are not implemented in the field reality.



## 5. Knowledge Gaps and Desirable Capacities

SN	Gaps	Desirable capacities
1	Lack of linkage and coordination between concerned ministry (forestry, tourism, agriculture and others)	- Policy analysis support - Formal and effective coordination mechanism
2	Lack of working environment - Incentive - Autonomy	- Time bond program - Incentives - Capacity building in specific area
3	Weak monitoring system	
4	Policy makers lack field reality information / knowledge	Policy change according to context
5	Lack staff capacity on technical skills and knowledge	- Specific training and capacity building
6	No clear government policy	One Government policy should not contradict with others.
7	Lack of coordination between different stakeholders	Functional and effective coordination mechanism to be established.
8	No capacity building program for those who are severely affected by action	Capacity building to the severely affected persons.
9	Lack of compensation to the affected households	Equitable compensation to the affected households/persons.
10	Lack of institutional autonomy to individual researcher	Performance based evaluation system a institutional level
11	Lack of infrastructure and financial resources for research	Adequate infrastructure and financial resource allocation in research
12	Lack of commitments towards research	Government and institutional commitments on research with its application of findings/ recommendations

## 6. Nepal's Experience on Ecosystem Services

### *Case I: Eco-tourism in the protected areas and poverty alleviation*

Protected areas (PAs) were initially established in Nepal for the protection of wildlife, especially endangered wildlife. However, the objectives have, since been broadened to include the preservation of natural, historic, scenic, and cultural values. According to the latest estimates, 26,695 km<sup>2</sup> (18.32%) of the total area of Nepal, now declared protected areas. The National Parks and Wildlife Conservation Act of 1973, with four times amendments, recognizes the six categories of protected areas in Nepal namely: national parks, strict nature reserves, wildlife reserves, hunting reserves, conservation areas and buffer zones. These protected areas are distributed in plain area of tropical climate (ranging 150 to 1000 meter altitude) to midhills (1000-3000 meters altitude) and extend up to the highest peak of the world including temperate to alpine zones (more than 3000 to 8500 meter altitude). These protected areas have diverse forest ecosystems, grassland ecosystems and wetland ecosystems and have both the national and international significance with enlisted world heritage (Sagarmatha NP); Ramsar sites (Koshi Tappu) etc. Sagarmatha base camp is considered one of the ten tourists' favorite sites in the world.

National Parks and Wildlife Conservation Act (1973) with its amendment in 1993 has made legal provision to share 30-50% of the revenue generated from the protected area for the local community development, which is administered through the buffer zone group and BZ committee at local level.



Five-year records of the Department of the National Parks and Wildlife Conservation (DNPWC) shows that on an average 145,351 tourists visited the protected areas that included national parks, wildlife reserves, hunting reserves and conservation areas. Tourists visit in the protected areas area create huge amount of employment to the local people in terms of guide, hotel, shops, entry fee to the government, porter, travel agencies, air services and so on. It also promotes local cottage industries, communication services and many other aspects. It is a good source of clean green dollar in Nepal. With the improved security situation in the country, the ecotourism is booming and the number of tourists is supposed to be doubled in the fiscal year 2007/08 than average number of tourists.

On an average about NRs 66 million revenue is collected from the protected areas out of which 30-50% is shared with buffer zone groups/committee for local community development. There are 16 protected areas in Nepal, which cover about 18.32 % of the total area of the country (DNPWC, 2006). Protected areas support ecotourism and vice-versa., thus, providing a leading source of foreign income for Nepal. Approximately, 45.50% of tourists (191,617) out of a total 421,188) visited protected areas in fiscal year 1998/89 (NBS, 2002).

*Cases II: Nepal's experience on revenue sharing from ecosystem services in the Kulekhani hydroelectricity generation*

The catchments area of Kulekhani reservoir, Kulekhani watershed is located in Makwanpur district of Nepal encompassing portions of 8 village development committees (VDCs) and distributed over 12492 hectares. The watershed provides valuable environmental services that affect the functioning of hydropower plants. Upland areas of Kulekhani watershed are not only the sources of water, but also a source of sedimentation in the Kulekhani reservoir. The deposition of sediments in the reservoir affects the life and capacity of the hydropower plant adversely. At the time of design, a sedimentation rate of 700m<sup>3</sup> per km<sup>2</sup> per year was projected based on previous data. Based on this projection, the project life was estimated to be 50 years from the date of construction, although the project was expected to function for 100 years. The actual sedimentation rate turned out to be much higher, reducing the reservoir capacity much faster than expected. The original bed level of Kulekhani reservoir was 1427 meters and the fully supply level was 1530.2 meters. The height of the intake was 1471 meters. There total storage capacity of Kulekhani reservoir was 85.3 million m<sup>3</sup> out of which 73.3 million m<sup>3</sup> was live storage and 11.2 million m<sup>3</sup> was dead storage. By November 2002, the total storage capacity of the reservoir had reduced to 62.3 million m<sup>3</sup>, (live 55.56 million m<sup>3</sup> and dead 6.74 million m<sup>3</sup>), a reduction of 23 million m<sup>3</sup>. The greatest rate of sedimentation occurred in 1993, 1994, and 1995 following the disastrous flood of July 19, 1993. In spite of this, several studies have indicated that well-managed forestlands produce much lower rates of sedimentation than poorly managed agricultural lands.

Water from Kulekhani reservoir is used to generate electricity amounting 92 MW, which is currently about 17% of Nepal's total installed hydropower capacity.

Nepal Electricity Authority (NEA) pays approximately NRs 250 millions per year revenue to the Nepal Government. As per revised Local Self-Governance Act (1999), the central government allocates 12% of royalty (about NRs 12.0 million per year to the Makwanpur District Development Committee (DDC). Again considering 20% of revenue 100%, the Makwanpur DDC has approved guidelines (2006) to spend 50% of its revenue in the upstream-downstream of the Kulekhani watershed i.e. 20% in upstream, 15% in downstream and 15% in the VDC where electricity is generated. Rest of the 50% revenue is spent in other VDCs, which do not fall in the upstream or downstream watershed of Kulekhani river.



About 6730 hectare of forest area has been maintained in the upstream of the Kulekhani watershed. Amatya (2004) evaluated soil erosion rates for different land-use types in the Kulekhani watershed between 1997 and 2002. The study has found that soil erosion rate for agricultural land in the Kulekhani watershed is substantially higher (73 metric ton/hectare/year) than that of forest land (1 metric ton /hectare/year). Maintenance of 6730 hectare of forest land reduces soil erosion by 484,560 metric ton per year. Thus, it is estimated that 243,311 m<sup>3</sup> of additional water is available for power generation because of forest conservation in the upstream watershed of Kulekhani.

Shyam Upadhyaya (2005) mentions by providing additional resources for their (upland communities) development, PES helps to achieve the national poverty alleviation goal, contribute towards the achievement of millennium development goals (MDGs) and promotes social equity and environmental justice.



## 7. Relevant Publications on Ecosystem Services in Nepal

In Nepal, the following relevant publications are available on ecosystem services so far to get some insights in this field.

1. Payments for Ecosystem Services: Sharing Hydropower Benefits with Upland Communities. RUPES Working Paper, Published by Winrock International, Kathmandu. Author: Shyam Upadhyaya, 2005.
2. Reducing Carbon Emissions through Community-Managed Forests in the Himalayas. Published by ICIMOD, Kathmandu, Editors: Kamal Banskota et. al., 2007.
3. Ecosystem Services of Himalaya Mountains Forests: Survey, Payment Options and Assessments of Carbon and Recreational Value. A Research Report Submitted by ANSAB to IDRC, Regional Office, New Delhi, 2006.
4. Investigating the Delivery of Ecosystem Economic Benefits for Upland Livelihoods and Downstream Water Users in Nepal. Published by IUCN, Kathmandu, 2006. There are publications of three policy briefs.  
Policy Brief 1: Conceptual Framework  
Policy Brief 2: Methodological Foundations  
Policy Brief 3: The Costs and Benefits of Conserving Shivapuri National Parks Catchments, Nepal
5. A Study Report on Economic Valuation of Churia Region. Published by IUCN, Kathmandu and written by Prakash Karn, 2007.

## 8. Discussions on Outcomes

- The workshop was really an educative event to create awareness among the different stakeholders and the participants on ecosystem services, which is a new science for a country like Nepal. Both presentations and panel discussions gave the introduction on ecosystem services and an overview on the country's status.
- The country is remained at preliminary stage of recognizing ecosystem services. The concept of environmental service payments are not explicitly recognized by national policy documents such as Poverty Reduction Strategy Paper (PRSP), Tenth Plan (2002-2007), Interim Plan (2007-2010), Sustainable Development Agenda for Nepal (SDAN) or by sectoral policies of Ministry of Forest and Soil Conservation (MOFSC) and Ministry of Agriculture and Cooperatives (MOAC) and Local Governance. However, Nepal has initiated and institutionalized some payments for ecosystem services in hydropower and protected areas sharing benefits (revenues) with local community.
- New stakeholders have been identified in the forestry sector such as Nepal Electricity Authority (NEA), and Media. In the past, these agencies were not considered as stakeholders of forestry sector.
- Ecosystem Research and Development is an advance division of forestry and environmental sector in Philippines and many other developed countries but there is not a single unit at Ministry and/or any Department in forestry sector in Nepal. The



workshop has given a realization of the felt need of separate unit or division of ecosystem services at ministry and/or department level.

## 9. Conclusion

Nepal is a hilly and mountainous but landlocked country. Its economy is based on subsistence agriculture along with livestock keeping. It has forest ecosystems, agro-ecological ecosystems, pasture ecosystems, and wetland ecosystems. Only few studies have been completed on ecosystem services in Nepal, which can be counted in fingers. They are: Ecosystem services for Kulekhani hydro project with the technical assistance of Winrock International through a project titled Rewarding Upland People for Ecosystem Services (RUPES), which was IFAD funded carried out with the initiation of Indonesia-based Center for International Forest Research - CIFOR), ecosystem services as a source of drinking water for the residents of Kathmandu metropolitan city carried out by the IUCN with DFID funding, ecosystem services of Churia hills in Terai as sub-surface level ground water charging in Bhabar and Terai conducted by IUCN with the funding from CARE Nepal,

Major problems/issues in ecosystem services are: (a) lack of explicit government policy on ecosystem services, (b) there is no accounting system developed and approved by the government agencies for ecosystem services, (c) lack of awareness to public and most of the stakeholders on ecosystem services, (d) ecosystem services are neither recognized nor institutionalized in the concerned agencies (e) there is lack of research evidences to convince the policy level authority to recognize and institutionalize the ecosystem services.

However, there are couple of examples of practices on payment for ecosystem services. Makwanpur District Development Committee has developed Guidelines (2006) to operationalize the 12% fund for the upstream-downstream of the Kulekhani watershed that it receives from the Nepal Government as per revised Local Self-Governance Act (1999); This can be spent on community development, forest conservation & management, and rural electrification as per demand of local community. The second example is that National Parks and Wildlife Conservation Act (1973) with its amendment in 1993 has made legal provision to share 30-50% of the revenue generated from the protected area for the local community development, which is administered through the buffer zone group and buffer zone (BZ) committee at local level.

## 10. Way Forward

**Documentations:** It is an immediate need to make documentations of the experiences and re-publications of existing documents in the field of ecosystems services in Nepal.

**Advocacy on ecosystem services:** Importance of ecosystem services has not given due importance. Thus, it is a high time to make advocacy by the national and international level agencies including IUCN, ICIMOD, NGOs, and NFA, FECOFUN/NEFUG, Water user groups/federations and others.

**Public awareness:** It is also time to bring public awareness on ecosystem services and its importance through different forestry sector user groups, water user groups and others.



**Advocacy to formulate policies:** The International agencies should start advocacy and influence the policy level to formulate national policies on ecosystem services mainly to the National Planning Commission (NPC), the MFSC, Ministry of Agriculture and Cooperatives, Ministry of Population and Environment and Ministry of Water Resources.

**Accounting system development for the ecosystem services:** One of the serious major problems in government system is the lack of accounting system of ecosystem services. It is urgently needed to provide technical assistance in developing accounting system and approved by the government mechanism.

**Formation of Ecosystem Division or Unit:** In order to institutionalize the ecosystem in the government system, ecosystem division or unit should be established in the concerned ministry and departments.

**Ecosystem research:** There is a strong need to carry out ecosystem research by the ICIMOD, IUCN, WWF, along with Forest Research & Survey and the concerned department, Academic institutions, CIFOR and other national and international level research institutes. Philippines has a long experience with good infrastructures in the ecosystem research services, thus, experiences on ecosystem research can be shared with such countries.

**Basket funding for ecosystem research:** Ecosystem research is related to many sectors, thus, it may be helpful of difference disciplines and sectors. Thus, basket funding may be helpful to carry research in ecosystem services.

**Nodal persons for ecosystem services:** There is a need to start with nodal persons in the concerned departments and ministries responsible for ecosystem services unless and until, ecosystem unit or division is not established in the Department of Forest, the Department of National Parks and Wildlife Conservation, the Department of the Soil Conservation, the Department of Agriculture, the Department of Livestock Services and so on.



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## ***Annex 1: Methodology/Process Adopted in the Workshop***

In the national workshop, the following process was adopted to meet the objectives.

**Introduction:** Each participant shortly introduced herself/himself with the name and organization represent.

**Welcome address:** Dr. Naya Sharma of Forest Action, both facilitated and welcomed the participants.

### Paper presentations

The first session was chaired by Mr. Prabhu Budhathoki, IUCN Representative in Kathmandu. In the first session, Dr. Bhim Adhikari, Research Fellow of University of Michigan University of USA, presented his paper on "Ecosystem Services and Poverty Alleviation Study in South Asia (ESPASSA)". This was an introduction on subject matter. Mr. Prakash Karna, Environmental Economist of IUCN Kathmandu, made his presentation on "Ecosystem Services and Poverty Alleviation: Current Situation and Opportunities in Nepal". Both papers have been given in Annex I and II respectively. Presentations were followed by a few questions, answers, and clarifications.

Dr. N. S. Jodha of ICIMOD also highlighted the importance of the stakeholders workshops on the prominent topic on "ecosystem services and poverty alleviation" mentioning it as a rare and good opportunity of mountainous country like Nepal. It is nice that this project has been initiated by three British Organizations and included South Asian Countries in the study area where largest number of people live in acute poverty situation. It is right time to identify the primary and secondary stakeholders of ecosystem services.

### **Questions, comments and suggestions on presentations:**

- The study should include the Intellectual property rights (IPR) and registration of traditional knowledge of indigenous people in natural resource conservation and management.
- How Nepal gets benefited from the carbon sequestration in the natural forests such as community forests, national parks and wildlife reserve (protected areas) ?
- Timber and fuelwood are frequently extracted from community forests, thus, how does it sequester the carbon?
- Dr. Bhisma Subedi informed that a study has found the carbon sequestration of 1-6 tons carbon per hector of community forest in Nepal.
- In Nepal, about 3000 hectare qualifies for claiming aid on carbon sequestration in plantations established in community forests. However, it has not been given recognition on natural forest or regeneration to qualify for getting aids.
- Forestry sector has been limited to technical issues. Forestry has not become a political agenda of political parties of Nepal. Thus, in changing political scenario, forestry should be made political agenda of the political parties, then only ecosystem services will be given due consideration.
- The term "Users" have not rightly included the "poor" and "forest dependent" people whose livelihood is dependent on forest resources.
- Shivpuri watershed is an important watershed that supply about one-third of water to Kathmandu population. The conservation of Shivpuri watershed has increased the quality and quantity of water even in dry season. However, one of the participants debated that conservation of forest has improved the water quality but how come does it increase the quantity, because huge quantity of water is evaporated from leaves of trees.



- Peoples living on Shivpuri watershed area are highly affected by the conservation of forest. Increased number of wildlife events of agricultural crop damage have been increased which have been proved by a couple of studies in those areas; after the declaration of national park, the local users have been restricted to collect firewood, fodder, and timber and non-timber forest products (NTFPs) from the forests as they were traditional users of these forests, thus, their traditional rights have been curtailed. These affected peoples have not been compensated so far by any agency and means. Other example was given that people living in the upper watershed does not have good school whereas downstream people are enjoying with high standard schools and other facilities. The concept of payment of environmental services could be one of the means and mechanism to pay them.

**Mr. Budhathoki Remarks (Session Chair):** It is a right time to highlight the ecosystem services (ES). This ES have not been well understood, thus, it has not been given due considerations at community, implementation and policy level. It requires accounting the science, knowledge and initiations. It is right time to establish functional linkage between upstream and downstream for the sustainable management of the natural resources mainly the most viable watersheds. In changing political context of Nepal, payment of environmental services keep an importance. It will not only contribute to the local, and national level rather it will also to global level. It will also contribute in the millennium development goal: environmental objective. It is noted that Nepal overlaps in both natural resource rich and poverty area. India is a bordering country in the south, east and west and it has very high economic growth, thus, it will certainly affect in the ecosystem of Nepal, which has high potentiality in hydropower generation.

Panel discussions

The panel discussion was chaired by Dr. Madhav Karki, Deputy Director of the International Center for Integrated Mountain Development (ICIMOD). Other panelists were:

Panelist	Organization
Dr. Deepak Gyawali	Water Nepal
Ms Apsara Chapagain	FECOFUN
Dr. Bhisma Subedi	ANSAB
Dr. Kamal Banskota	ICIMOD
Dr. Hemant Ojha	Forest Action



**Panelist Dr. Deepak Gyawali:**

- Entire Himalayan Region is not included in the study of IPCC.
- In past, Mauza (Butwal) irrigation canal was used to be maintained by local community voluntarily. The recently, the tradition has been broken down due to modernization. The government can not invest huge amount of money for yearly maintenance and local people do not want to volunteer. The Mauja irrigation canal is not properly delivering irrigation service.
- US\$ 1 income per day definition of poverty is meaningless in Nepali context. It is to be re-defined in our own socio-economic context where people can live with dignity. In Birethanti of Kaski district, poor is considered those households who have no employee in Malaysia and other countries.
- There is a strong relation between water use and poverty for different purposes. The people of Bhabar zone of Terai do not have enough surface water for irrigation because it (surface water) is not available and extraction of ground water in very deep well is very expensive.

**Panelist Ms. Aprsara Chapagain**

- Conservation and management of community forests have drastically improved the ecosystem condition in Nepal.
- 14300 community forests have been handed over to manage the community forests. Local community people are readily getting fodder, forage, fuelwood, timber; number of wildlife have drastically increased with augmented number of interface between wildlife, people and domestic animals than past which is a good indicator of improved ecosystem.
- The non-timber forest species have been conserved and managed in community forests; the users collect and sell them, which give them a good source of income for their livelihoods.
- A large number of community development works have been completed from the income of the community forests, which include school building, salary of teachers, scholarship to poor students, forest enterprises and ecotourism.
- There is an opportunity to include ecosystem services during renewal of operational plans of community forests. However, a large number of operational plans have been waiting for renewal.
- The concept of forest inventory in community forest has been enforced to maintain ecosystem and biodiversity conservation in it.
- It is a debatable subject that community forests has benefited all the poors. However, it is a high time to revisit the policy, strategy and implementation status of community forest and focus on pro-poor, gender sensitive with at least 50% women representation and their key role in decision-making process.
- Forest issue should be made a political agenda for the political parties for due consideration.
- Master Plan for Forestry Sector (1989) which is now time to renew or reformulate should include the ecosystem service and poverty issue.
- IEE/EIA has created a lot of confusion and it has hindered in the collection and export of NTFPs.
- In new constitution, the forestry issues should be given due consideration.
- Community forestry has not addressed the voice of all levels of users mainly poor, women and voiceless people.

**Panelist Dr. Kamal Banskota**

- In 1995/96 a study was conducted on willingness to pay (WTP) with tourists. They were ready to pay US\$ 2.00 additional what they were paying at that time. During that period, time entry fee for a tourist in the national park was NRs 300.00, which



was equivalent to US\$ 12.00. The study recommended to increase the entry fee but he does not what happened thereafter.

- A study was also carried out on carbon sequestration jointly by ICIMOD and the Netherlands. But Nepal could not get benefited from the natural forest, regeneration management, and maintenance of protected areas as per Kyoto Protocol. However, it is hoped that Nepal would get benefit after 2012.
- It is noted that the customer or purchasers (the donor or listed countries of the Kyoto Protocol) evaluate the value of the forest and then only they pay as per criteria.
- As per UNFCCC, It is a methodological issues on how to measure or evaluate the carbon sequestration. Three sites have been selected in Nepal and four sites in Uttanchal India to carry out pilot study on methodological development. The project is on-going in the third year out of five year for methodological development of carbon sequestration.
- It is debatable that poverty is one of the drivers for the deforestation.
- Community managed forests in the Himalayan region are becoming an important carbon poor, as previous deforested areas in these forests are showing signs of regeneration. The mean carbon sequestration rate of community forests in India and Nepal is close to 2.79 ton carbon per hectare per year or 10.23 ton carbon dioxide per hectare per year (Singh & Banskota, 2007).
- In 1940-50, forest was used for timber and considered free goods. In 1990', it was visualized the space for biodiversity conservation and now there is a new look, new concept that forest is also envisioned from the ecosystem services, carbon sequestration, etc. Thus, economics of forest is changing over time.
- Previously forest was also considered environmental economics from functional perspective but due to market failure, it has gone beyond the environmental economics and new field of ecological economic emerged..
- It is very difficult to marketing of the ecological goods, thus, non-marketing regulating systems should be taken into considerations.
- Who should own the benefits of the carbon sequestration of community forest? This is an issue that needs to be taken account.

#### **Panelist Dr. Hemant Ojha**

- Dr. Ojha focused on governance issues i.e. environmental governance. For the forest management, governance should be brought at the center rather than the forest.
- There is specific expertise in water, forestry and/or individual subject but there is lack of knowledge, skills and expertise on total ecosystem. There is ministry and departments of visible goods such as forest, but there is no ministry for non-visible goods such as ecosystem.
- Self-initiated institutions, market and marketing of goods are visible but the ecological services can not be readily marketed.
- This is not the workshop only for forestry professionals, thus, there is need of new institution.
- Women representation and voice is very low in the workshop.
- How to participate in the ecosystem services and governance is a big question?
- Discourse is going on representation in the political institutions.
- In order to transform the governance, it should be widened.
- The government should seriously look into ecosystem perspective.

#### **Panelist Dr. Bhisma Subedi**

- Previously forests were managed mainly for timber production. Now it is equally important for the production of NTFPs/MAPs.
- Global warming is presently a hot issue in the world.



- We should also look into the forest from biodiversity and ecosystem services.
- Community forests and protected areas can not address the poverty issue. It is a big issue that how poor can be benefited from the ecosystem services.
- At present, it is not limited to the mountain forest, and forest stewardship, now forest conservation is looked at from the perspective of carbon trading.
- Now it is the time of voluntary market, certified of accreditation.
- We are in the very initial stage of carbon trading at global market so lots need to be done.

### **Questions/Answers and Clarifications to Panelists**

- Community forestry may have scope to get benefited after 2012 from carbon sequestration. Some study has been carried out on afforestation/ reforestation (A/R). We may have to wait and see whether it meets the criteria or not to get fund.
- This is a power politics and advocacy. International agencies like ICIMOD may have important role to play on advocacy in the international fora.
- In community forest users have been put at the center but not the forest dependent people. Forest is house; forest is source of livelihoods for the forest dependent people but not for the users. Forest dependent peoples can not live without forest.
- In Mid- and Far Western High Community forest has hampered in the transportation of food items, which had direct and indirect impact on nutrition of child and women. This issue needs to be validated.
- There is no representation of political parties in the workshop.
- How to define the stakeholders is a big issue. Who are the stakeholders?. There is no representation of those forest dependent people in the workshop who can not live without forest.
- What is the observed and/or projected input of Nepal?
- More than 500 bundle head firewood is sold and consumed everyday at market center of Muglin of Chitwan district. Is there control of community forests on the supply of firewood in such a big quantity?
- How synergy could be maintained between two projects (Water Nepal and ESPASSA)?
- Whether hill community forest model is not suitable for Terai? We need to assess the hill model and look for suitable model for Terai.

### **Answers on Questions**

- In past, donors directed us what would be the best for us. Now it is time for us to say what is good for us.
- Afforestation/Reforestation (A/R) does not qualify to CDM. However, we have focused on methodological issue.
- The recommendation of the study was forwarded to the government on willingness to pay but we do not know whether the recommendations were executed or not.
- Problems have been noticed in the grazing of animals, which are used in transportation of good items in Jajarkot, Dolpa, Jumla and Humla districts of mid-west region. The community forestry sector should look into it.
- In Terai district, the local users have been protecting the forests but such forests have not been handed over in community forests after circulation made by the Forest Minister Matrika Yadav. Ban on community forests hand over be lifted by the Forest Ministry as soon as possible to protect forest.



- Global warming is not equal in all the locations. It has extreme effect and impact. Sometimes, it creates longer droughts; sometimes extreme rainfall of 3-5 year period over a night in one location. For example, last year snowfall in Kathmandu was exceptional event for last 32 years.
- Extreme "Cloud burst" is another example of global warming for example in Gujarat, Ahamadabad in India.
- It has been found that farmers who are dependent on one crop are much susceptible and vulnerable than marginal or landless farmer to cope with the drought.
- Synergy between two projects are to participate in the different forums and meetings and share one another experiences to benefit each other.
- The British Research Institutions wanted to know what research could be done in coming 10 year period.
- The term "stakeholder" itself is wrong to apply of a village. A poor or landless household and a landlord can not be put at a balance considering them stakeholder. There is big different in the perspective of a landless household and a landlord of the same village.
- It is big question whether leader of political party will participate in such a technical issue of ecosystem services. We will be happy if any political leader is interested to participate in such events and participate in the full session.
- The Chairperson of the Panel Session Dr. Karki thanked to the panelist members. He concluded his speech with following remarks:
  - There is difference between ecosystem and environment.
  - Climate change is not the driver of ecosystem.
  - There is increasing incidences of glaciers landslides in Nepal due to climate change.
  - Valuable wildlife are rapidly disappearing from the protected area.
  - From the adaptation method, rate of climate change can be reduced.
  - The population, which is providing ecological services, should be rewarded.
  - Resource governance should be revisited and improved.
  - Media will have important role in creating awareness on resource governance.
  - The link between science and policy should be improved.
  - We are far behind in achieving MDG environmental goal. This workshop will help to share experiences, knowledge, and skills among the stakeholders.

#### Group Work and Presentations

All the participants were divided into 7 groups namely. Each of the groups was assigned a moderator who facilitated the group. These moderators were given short briefing on the subject of moderation/facilitation.

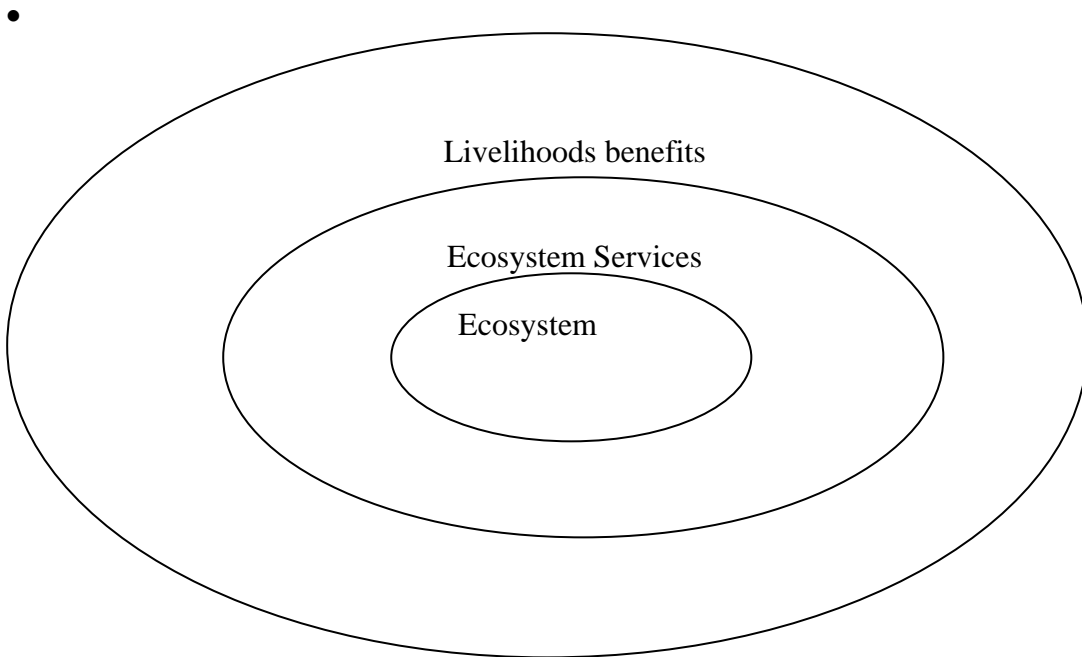
Group 1: Resource Manager Group - Moderator: Dr. Hemant Ojha  
 Group 2: User Group - Moderator: Mr. Mani Ram Banjade  
 Group 3: Civil Society Group - Moderator: Mr. Harisharan Luitel  
 Group 4: Academia Group - Moderator: Mr. Him Lal Shrestha  
 Group 5: Corporate Group - Moderator: Mr. Prakash Karn  
 Group 6: INGO/Bilateral Group - Moderator: Mr. Bijay Singh  
 Group 7: Media Group - Moderator: Ms. Basundhra Bhusal

Each group met separately, discussed and come up with presentation materials. The participants who represented their organizations were kept in the concerned group for example Government employees from the different organizations participated in Resource Manager Group and the representatives from NGOs in NGO group and so on. Guidelines to discuss in groups were shortly briefed which were:



## Guidelines for Group Work

### Activity 1.1: Ecosystem services and human wellbeing



Identify the ecosystem services and show their contribution to livelihood benefits (focusing one of the four given ecosystems but taking some examples from all of them: Forests, grasslands, wetlands, agro-ecosystems).

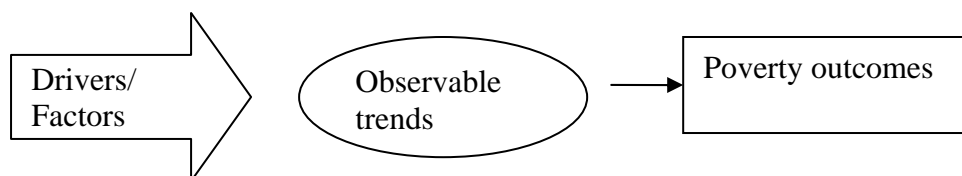
### Activity 1.2 Stakeholders and their interests

Who are the stakeholders in the management of the ecosystems and what are their stakes/interests?

How do others interests complement/conflict with others? Make specific points in bullets.

### Activity 2.1 Trends in ecosystem changes, drivers and poverty outcomes.

- What are the observable trends in ecosystem change? List them in terms of priority.
- Take three most important trends and answer the following:
  - What are the major factors contributing to these changes (trends)? Show in diagram.
  - How have the specific changes in ecosystem contributed to exacerbate or reduce poverty?





**Activity 2.2: Policy responses and their outcomes**

- What are the government's public policies to address the above situation (ecosystem degradation and resulting impacts on poverty)? List policies and assess their effectiveness.

**Activity 2.3: Stakeholder Strategy**

- What are your approaches and strategies in response to the ecosystem degradation and their poverty outcomes?
- What specific roles have you been playing towards this end?
- What are current gaps in your capacity to deal with the problem? List both existing capacity and also desirable capacity/resources.



## Annex 2 Group Presentation on Forest Ecosystem by the Different Groups

### • Presentation by the Resource Manager Group

This group selected Forest Ecosystem.

- Opportunity, Employment and Income
- Recreational value → mental health
- Soil and watershed conservation → security, reclamation, land production, & water quality
- Medicinal and aromatic plants → income, health + employment
- Pond - nutrition - (capability)
- Fiber → income
- Fodder & grass → livestock → meat & milk → income
- Construction materials → house → security → capability, status, capability
- Energy → charcoal, fuelwood → security
- Carbon sequestration → health sequestration, income → disaster mitigation
- Aesthetic value → opportunity, employment, tourism → income
- Recreational value → employment opportunity → income

### Stakeholders and their interests from Managers' Perspective

SN	Stakeholder	Interests/stake
1	Forest user groups (Community forest, leasehold forest, collaborative forest, private forest) - products: timber, grass, NTFPs, fuelwood - Nature of dependence : fuelwood seller, farmer, herder, NTFP collector, trader, industrialist	- right to access / benefits - use of products in sustainable basis - Make optimal income
2	Policy maker - senior official - Minister - MPs - Party leader	To provide appropriate services to the public (power exercise / money exercise)
3	Policy implementer - District/ regional officer, staff	- To provide appropriate services - Power exercise
4	Advocacy group + I/NGOs	Issue raised (local, regional, leadership development, empowerment)
5	Service providers (Govt, NGO, private)	- Public oriented services - Project (employment)
6	Donor, INGO, bilateral, multilateral	Help to development programs
7	Research Academic	- Influence policy, practice, research - Research, carrier projects

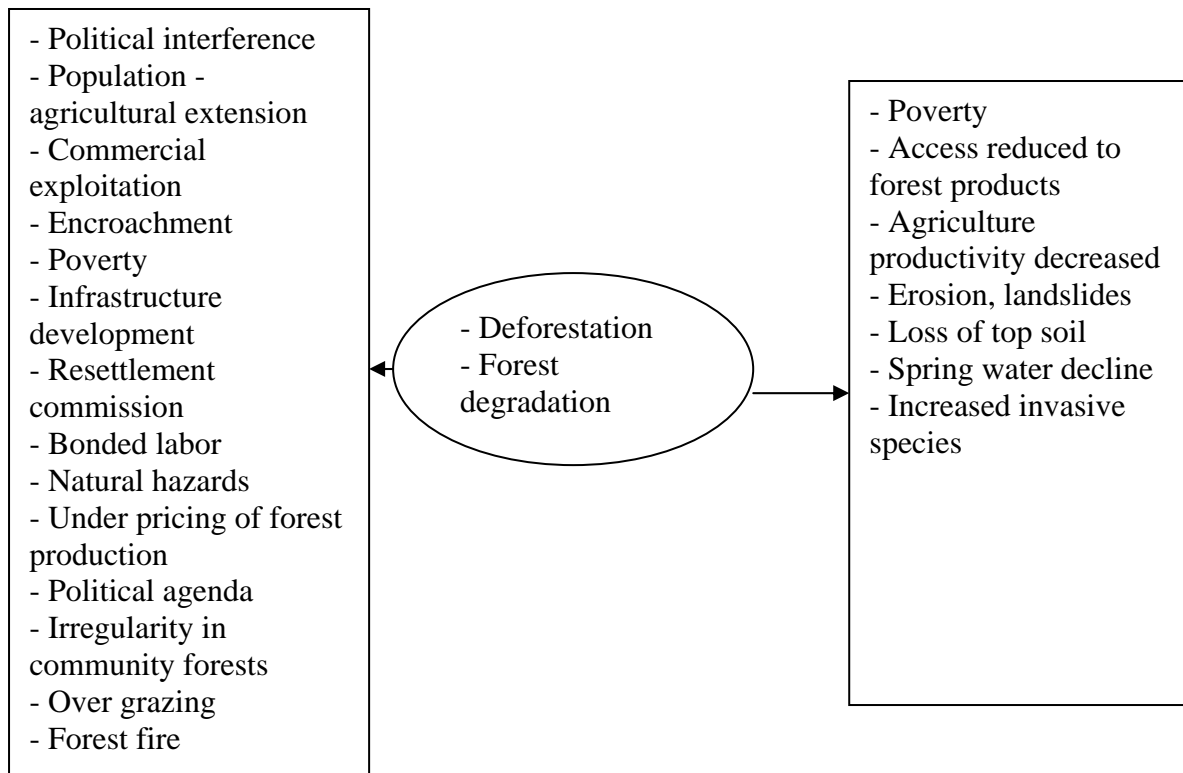
### 2.0 Conflict in policy makers

- Advocacy group, donors, user groups, Intra policy maker (political leader)



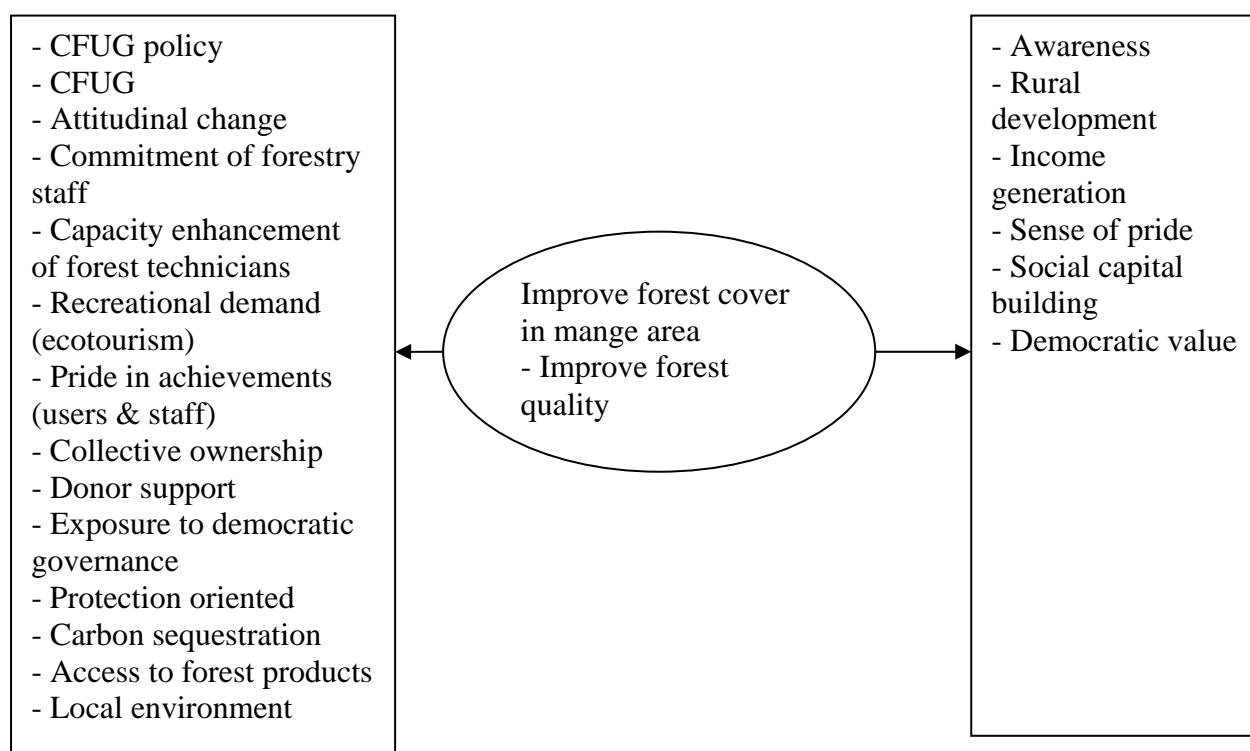
### 3.0 Trends in ecosystem change

Driver: deforestation, forest degradation





## Positive Change in Ecosystem



## 4. Policy Response

Forest Nationalization Act 2013 B.S.

SN	Issue on ecosystem change (Negative)	Policy Response	Effectiveness
1	Private ownership of forest	Forest nationalization	Mixed: - conversion to agricultural land - Government forest
2	Massive deforestation	Forest Act 2018 B.S. Special Act 2024 B.S.	- Protection oriented - Exclusion - Contradiction between policy and people
3	Government deforestation	Community forestry policy, Master Plan for Forestry Sector	People's participation in community forestry

## 5. Approach/Strategy

- Peoples participation prioritization
- Ecotourism
- NTFP promotion policy
- Policy, guidelines, directives for forest management

### 5b. Specific roles

- Domestication of NTFP
- Ecotourism (incorporation in policy)
- Wetland policy



- Inclusion of district users in forest management
- Open area management
- Private + agroforestry
- Income generation based on well-being ranking
- Land allocation in CF

## 5c. Gaps

SN	Gaps	Desirable capacities
1	Linkage between concerned ministry (forestry, tourism, agriculture & others)	Interaction between concerned policy makers.(ministry) - Policy analysis support
2	Working environment - incentive - Autonomy - Political	- Time bond program - Incentives - Capacity building
3	Monitoring / learning capacity	
4	Staff capacity on technical knowledge, skills	Training, exposure visits, joint meetings
5	Policy makers (lack of field reality information/ knowledge)	Policy change according to context

## 2. Presentations of User Group

User group has also selected the forest ecosystem.  
Services from the forest ecosystem has been enlisted as follows:

### Activity 1.1 Environmental Services

Firewood → homeuse, sale in the market for income

Fodder & forage → improved livestock keeping → milk/meat production, improved health, saved time

Tiber → homeuse, sale → employment/income

Scenic view → tourists → income, knowledge, skills, social problem (e.g. prostitution)

Knowledge/skill

Watershed conservation → protection of human life, agricultural production, increased income, protection of private property → Reduction in out-migration and reduction in mental tension

Bhorla leave/Ketuki → rope making, home umbrella, tapari → income source

Lokta - Nepali paper → income

Bamboo/nigalo - homeuse → doko/namlo

Jhyau → income source, raw materials for factory

Food items (Niuro, Chayu, Tarul) → food items of poor → improved health

Fruits - Income, food, → improved health

Animal bedding materials - compost → improved fertility → production

Wildlife - Research, natural beauty → ecotourism → income

Water source → homeuse, irrigation, industrial use, hydroelectricity → agricultural production

Medicinal and aromatic plants → homeuse for medicine, processing, sale - income source

Oxygen → good health

### 1.2 Stakeholders and their interests/stake



SN	Stakeholder	Interest/stake
1	Forest user group	Conservation, management, utilization (daily need fulfillment, sale)
2	FECOFUN	Empowerment of user groups, group representation
3	District Forest Office	
4	NGOs (forest related)	
5	Local government	
6	Forest product traders	
7	Political parties	
8	Ecotourism entries	
9	Donors/funding agencies	

## 2.1 Observed changes in forests

The following changes have been observed in forests.

- Greenery
- Soil conservation
- Increased in number of wildlife
- Destruction of forest mainly in Terai area
- Increased biodiversity

Out of the above mentioned, greenery has been selected for further discussions.

### Greenery in forest

- Plantation
- Ownership feeling in the users
- Increased awareness
- Increased number of users groups with their active participation
- Leadership quality
- Local community development - scholarship to poor, road, school construction, salary of the teachers etc.
- Increased feeling in communal works
- Positive impact on sanitation
- Increased water sources
- Increased funding support in forestry sector
- Ecotourism - income source
- Fodder/forage source
- Readily availability of forest products in rural households
- Good relation between users and forestry organization

## 2.2 Policy response and effectiveness

SN	Policy response	Effectiveness
1	Master Plan for Forestry Sector (1989)	Formulation of Forest Act 1993 and Forest Regulation 1995 (positive)  Community forest hand over  Forest protection and community development activities Contribution in poverty alleviation

## Presentation of NGO Group Stakeholder



This group has also selected **forest ecosystem** for the discussions.

SN	Forest ecosystem Goods	Services
1	Forest resources (timber, fodder, fuelwood, medicinal plants, minerals)	Climate regulation
2	Water resources	Water quality
3	Soil/humus	Biodiversity conservation
4	Air	Aesthetic/ecotourism
5	Wildlife	Research and education
6		Human condition (health, attitude, quality of life, longevity . . .)
7		Cultural services (spiritual and religious value)
8		Support services (nutrients cycle, soil formation, carbon sequestration, pollination)
9		Grazing

### 3. Livelihood benefits

- Basic need fulfillment (energy, shelter, food, fiber)
- Income increase
- Nutrition and health (dairy, meat)
- Peace - festival, spiritual, purification, shade, rest, recreation

#### Negative aspects

- Wildlife damage (human, livestock, crop)
- Wildlife human issue (i) wildlife-livestock grazing competition
- Knowledge and empowerment - traditional knowledge
- Emergency relief (shelter, food)

### Stakeholders and interests/stakes

SN	Stakeholder	Interest/stake
	Grazer	Grazing livestock - dairy/meat/transportation, wood/skin/hide etc.
	Firewood collectors	Self consumption, & sale - income
	Grass collectors	Animal feed, thatching, cottage industry, grass sale,
	NTFP collectors	Self consumptions, cottage industry, sale to others, contract labor
	Contractors (construction materials)	Quarry mining, sand, soil, timber, stone - commercial and domestic purposes
	Researcher	Knowledge creation, knowledge contribution, knowledge credition, recognition
	Forest dependent indigenous peoples	Basic livelihoods, traditional practices, heritage
	User group	Leadership, special benefits, allowances, Politics, social services, knowledge and experiences
	Local government	Income tax, employment, infrastructure development



	Government line agencies (DFO, warden)	Authority exercise, revenue generation, forest conservation, regulation and management
	Policy maker	
	Tourism entrepreneurs	Resort, hotel trekking agency
	Private company	Sawmill, herbal processing company

#### 4. Trend in ecosystem change

1. Community forest area increased
2. National forest encroachment increased
3. NTFPS production/collection increased
4. Firewood consumption ??
5. Timber consumption/production increased in housing and furniture
6. Timber production in community and private forest increase
7. Ecotourism increased
8. Deforestation for infrastructure increased (road, canal, high extension line, industries)
9. Biodiversity increased.

#### 5. CF Area – Drivers

SN	Drivers	Outcome
	Community forest	
	Public awareness	Organized groups Favorable policy Increased availability of forest products NTFPs recognized as major income source Recognition of Nepali community forest processes Traditional systems revived (Singinawa in Khumbu)
	Government promotion	
	Peoples need	
	Donor support	
	Traditional system	

#### Major Policy and role



- MPFS 1988 - positive
- CF Policies Act, Regulation - positive
- NTFP Policy 2004 - positive
- NBS 2002 - positive
- CF Guideline - positive
- CF in BZ policy and guideline - positive
- CA Regulation - positive
- LSGA - taxing on local resources - controversial
- 10th plan - positive
- NCS 1988- positive
- Different interpretation of these policies - timber selling by CFUG, ceiling of volume of NTFPs trade.

#### **Stakeholders' strategy**

SN	Strategy and role	Expected Capacity building
	Awareness raising	Technical capacity - yes Institutional capacity - yes Financial resource - limited
	Capacity building	
	Advocacy /pressure building	
	Action research	
	Facilitate/ provide platform	
	Organizing	



## Presentation of Academia Group

This group had also selected **forest ecosystem** for the discussions.

### 1. 1 Activity

Services of Forest ecosystems	Services of Grazing land ecosystem	Services of Wetland ecosystems	Services of Agro-ecosystems
Timber	Grazing	Biodiversity	Crop farming
Biodiversity	Watershed management	Tourism	Watershed management
Carbon sequestration	Habitat protection	Water source	Agro-forestry
Recharge	Carbon sink	Habitat	Carbon sink
Watershed management		Carbon sink	
Energy/biofuel		Fish farming	
<b>Livelihood Benefits</b>			
Forest-based industry	Livestock management	Food	Food
NTFPs	Pulp and paper industry	Irrigation	
	Thatching materials	Drinking water	

### Activity 1.2 Stakeholders and Stakes/Interests

SN	Stakeholder	Interest
1	User group / community	Forest products & livelihoods
2	Government	Conservation and management
3	Furniture industry	Income generation
4	Pharmaceutical industry	Income generation
5	Researchers / academia	Knowledge generation and dissemination

SN	Compliment	Conflict
1	Cross-cutting & common interests	Gaps in finding dissemination
2		Data confidentiality
3		Recommendations and implementations
4		Leadership versus empowerment
5		Inconsistent / impractical legal framework or policies



## Activity 2.1 Observable Trends and Drivers and Poverty Outcome

Drivers/factors	Observed trend	Poverty Outcome
Internal migration	<b>Forest Depletion</b>  <b>Hazards (flood, landslides)</b>	Poverty
Refugees		
Cantonments		
Security consciousness		
Forest policy		
Lack of awareness		
Deforestation		
Agriculture intensification		
Land use change		
Climate change		

## Activity 2.2 Policy Interventions and Effectiveness

SN	Policy interventions	Effectiveness
1	Forest management by user groups	Forest cover increased
2	Private / leasehold (forest policy)	Promoted wood / furniture industry
3	Land tenure / renewal (impractical policy)	Unsecured future (conflict)
4	Collaborative versus community forest management	Debatable

## 2.3 Stakeholders Strategy

### a. Approaches and strategy

- To promote climate positive and do it project.
- Synergy in action
- Coordination and involvement of stakeholders from proposal preparation to implementation

### b. Role play

- Design and delivery of specific courses
- Formulation of assessment tools and capacity building

### c. Current gaps

- Lack of institutional autonomy to individual researcher
- Lack of management in upgrading, maintenance of existing facility and human resource
- Lack of financial resources
- Lack of commitments towards research

### d. Desirable

- Performance based evaluation system at institutional level
- Adequate financial allocation in research
- Provision of incentives / internships / promotion

### Presentation of Corporate Group

The corporate group also selected **forest ecosystem** for the presentation.

The following ecosystem services have been identified:

#### Water -

1. Drinking water- human wellbeing
2. Electricity product - power generation - living standard, industrialization/GDP
3. Industry - economic growth-livelihood



**Timber** - Living standard

Furniture - income - living standard

Infrastructure

**NTFP** - State royalty

Income generation

Homeuse medicine

**Erosion/Disaster control** - Soil erosion control

Landslide control

Soil fertility increase - agricultural production - livelihood

Desertification control

**Wildlife protection** 1. Tourism - 1.1 Revenue to state 1.2 Local livelihood support

**Climate regulation** 1. Increased oxygen 1.1 Life support system - human well-being

2. Decrease carbon dioxide - Global warming - human wellbeing

## 1.2 Stakeholders and their interests/stakes

SN	Stakeholder	Stake/interests
11	Ministry of Forest, Department of Forest and District Forest Office	Revenue generation, Forest conservation
2	NTFP Coordination Committee	Trade promotion & revenue
3	NGOs/INGOs	Conservation & livelihoods support
4	Trade associations (FNCCI, NEHHPA, Water User Group Association, FECOFUN)	Trade, income, irrigation, agriculture
5	DDC/VDC	Revenue , conservation
6	Revenue department	Revenue
7	NEA/NWSC/ Bankers/Cross-border trade	NEA - hydropower Bankers - investment NWSC - Water supply Water linkage with forest

## 2.1 Observable Trends in ecosystem Change

- Deforestation
- Floods
- Landslides
- Reduction in agriculture production
- Reduction in wildlife population (extinction of few)
- **Medicinal and aromatic plants reduction / extinction - priority for further discussion**
- Reduction in livestock population
- Climate change / global warming
- Reduction in river system flow
- Soil erosion
- Reduction in fish production
- Timber decrease



## 2.1 Reduction in NTFP trend

Drivers/factors	Observed trend	Poverty Outcome
Poverty	Reduction in NTFP	<ul style="list-style-type: none"> <li>- Less herbal medicine</li> <li>- Less tourism</li> <li>- Reduction in cash earning</li> <li>- Destruction in system</li> <li>- Impact on livelihoods</li> </ul>
Unclear state policies		
Bureaucracy		
Lack of skill /knowledge/ technology / market		

## 2.1 b Deforestation trend

Drivers/factors	Observed trend	Poverty Outcome
Encroachment	Deforestation	<ul style="list-style-type: none"> <li>- Population growth</li> <li>- Health</li> <li>- Low income</li> <li>- Agriculture production low</li> <li>- Aesthetic value low</li> </ul>
Poverty		
Firewood extraction		
Bureaucracy		
Political interference		

## 2.1 Increased flood trend

Drivers/factors	Observed trend	Poverty Outcome
Climate change	Flood increasing	<ul style="list-style-type: none"> <li>- Soil erosion</li> <li>- Reduction in agricultural land</li> <li>- Reduction in productivity</li> <li>- Wash out infrastructures</li> <li>- Effect in health</li> <li>- Waterborne disease</li> <li>- Sanitation problem</li> </ul>
Forest area decline		

## 2.2 Policy response

1. Government forest Acts and policies - less effective
2. NTFP Policy 2002 - Not implemented
3. R & D in forestry sector - poor
4. Technology - poor
5. Training / capacity building (knowledge/skill/awareness - poor
6. Investment - poor
7. Market - poor

## 2.3a Stakeholder Strategy (Corporate)

- Create awareness to the stakeholders about ecosystem degradation and its negative impact to their daily life.
- Role of stakeholders in decision-making and implementation and advocacy as well
- Benefit sharing among the stakeholders and owners
- Public-private partnership for the implementation of the project
- EIA/IEE/SIA study before program implementation.

## 2.3b Specific role (Corporate)

- Knowledge/skill transfer
- Cost sharing among stakeholders
- Market extension (locally/nationally/internationally)
- Production enhancement
- Poverty reduction
- Employment generation



### **2.3 c Current gaps**

- No clear government policy
- No coordination among stakeholders
- Contradictory policies in different ministries
- No capacity building program for communities who are severely affected by the action
- Socioeconomic condition
- Compensation etc.



## Presentation of Media Group

Media group had also selected the **forest ecosystem** for the discussion.

### 1.1 Forest ecosystem

1. Food, fodder, fuelwood, timbers, MAPs/NTFPs
2. Watershed conservation, habitat protection
3. Biodiversity conservation
4. Religious value, recreation
5. Ecotourism

1. Food/fodder → nutrition, income for livestock ,  
NTFP/MAPs → direct consumables - reduced food deficit, increased income from MAPs, timbers/ fibers , better health condition/ education, employment creation
2. Increased productivity → increased income  
Prevention from natural disaster → reduced vulnerability → decrease in loss of life/property  
Protection of natural gene bank → community benefits in future → patent rights
3. Recreation → Increased domestic and foreigner tourists → increased entry fee and employment → increased income → support to livelihood

### 1.2 Stakeholders and their interests/stakes

SN	Stakeholder	Interests/stakes
1	Local residents - primary users	Get direct benefits
2	Local government (VDC/DDC)	Taxation/Royalty
3	Central government	
4	Local CBOs/NGOs/user groups	
5	Firewood collectors	Fuelwood
6	Herbs/NTFP collectors	Trade/self consumption
7	Traditional healers	Traditional medicine
8	Water collectors	Water (human, animal, irrigation)
9	Grazers	Grazing
10	Blacksmith	Charcoal
11	Small scale industries (Allo processing)	Raw materials
12	Paper (handicraft)	Raw materials
13	Livestock herding	Grazing
14	Trophy hunting	Recreation

### 2.1 Observable Trends in ecosystem Change

1. Deforestation
2. Loss of biodiversity
3. Disappearance of water bodies (wetlands)

#### 1. Deforestation

- Political instability
- Lac of employment opportunity
- Lack of alternative energy
- Low income
- Illegal encroachment
- Corruption
- Tendency to give forest land to landless people



- Lack of political commitment
- Inefficient government mechanisms
- Infrastructure development

## **2. Loss of biodiversity**

- Bio-piracy
- Monoculture
- Use of pesticides/chemical fertilizer - reduced productivity - health damage
- Respect of indigenous knowledge

## **3. Disappearance of water bodies**

- Encroachment
- Lack of proper land use system
- Deforestation
- Infrastructure development (Environment unfriendly)
- Loss of watershed

**Above three component increase poverty**

## **2.2 Policy responses and their effectiveness**

<b>SN</b>	<b>Policy response</b>	<b>Effectiveness</b>
1	CF Policy	Less effective
2	Forest Act 1993	Lack inter-departmental coordination
3	National Act	Not people centered
4	Soil Conservation Act	No implemented yet
5	10th Plan	Improper implementation of sectoral policies
6	International conventions	Government does not consider ground realities while signing the treaties

## **2.3 Stakeholder Strategy**

(i)

- Political stability
- Political commitment
- Effective use of local/ community / national/ media
- In-built media component as an integrated part

(ii) Producing programs (television, radio, print) advocacy lobbying

(iii) Media should be considered as positive contributions even sometimes highlight negative way.

- Media people should be oriented on ecosystem service reward issues on regular basis.



## **Presentation of INGO/Bilateral Group**

This group has selected **wetland ecosystem** for the group discussion and presentation.

### **1.1 Ecosystem services and human wellbeing in the wetland ecosystem**

Ecosystem services identified were:

#### **Water:**

Drinking water → health and sanitation → good health

Irrigation → agriculture production → livelihood

Hydro power electricity generation → industry/lighting → industry → employment/ living standard

#### **Aquatic food**

Nutrition → good health

Income

Source of livelihood for indigenous peoples

#### **Biodiversity**

Gene preservation → future benefits → intellectual property rights

Livelihood options

#### **Aesthetic**

Ecotourism → increased tourists → employment/income

Mental peace → Productive human resources → good health

Spiritual bath (e.g. Gosaikund) → mental peace/sacredness/purification

#### **Recharge water table**

Resume moisture content → agriculture productivity

#### **Flood control** - security

**Recreation** → adventure rafting → ecotourism

**Habitat for birds/animals** → biodiversity e.g. wild rice, rhino, birds

**Cremation location** → River confluence

Social relation → harmonize bonding

**Disease care** → hot water springs → health/spiritual

**Research opportunity** -



### Activity 1.2 Stakeholders and their interests

SN	Stakeholders	Interests
1	Indigenous peoples (e.g. Majhi)	Survival/ livelihoods
2	Farmers	Irrigation/ drinking water
3	Protected areas	Species / habitat conservation
4	Forest department	
5	DDC/VDC	Revenue
6	Tourists	Recreation
7	Sportsman	Recreation
8	Researcher	Exploration / knowledge
9	Religious group	Spirituality
10	Irrigation department	Irrigation
11	NEA	Hydropower
12	Drinking water supply board	Drinking water
13	DSCWM	Watershed conservation

#### 1.2 b Conflicting interests

- Conservation versus development
- High dam versus local community
- Reclamation versus agriculture land conversion
- Wetlands are considered as waste lands
- Water use conflict
- Affluent discharge versus clean water
- Recreation versus fishing
- Power production versus recreation

#### 2.1 Trends in ecosystem change, drivers and poverty outcomes

This group has identified the following observed trends out of which reduction in number and area of wetlands has been identified as main observed trends.

1. Reduction in number and area of wetlands
2. Wetland pollution
3. Eutrophication
4. Drainage/seepage
5. Global warming
6. Plant succession
7. Encroachment/ conversion for agriculture land
8. Faulty landuse/siltation
9. Infrastructure development
- 10 Over extraction of aquatic food items .e.g. fishing
11. Natural calamities



Drivers/factors	Observed trend	Poverty Outcome
Population pressure on land and water	Reduction in number and area of wetlands	- Scarcity of water
Lack of awareness		- Flash flood
Haphazard and uncoordinated wetland		- Conflict in resources
Lack of good governance		- Reduced food production - malnutrition
Global warming		- Traditional knowledge killing
Development infrastructures		- Loss of recreational opportunities
Imbalance development		- Decline in tourists and income

## 2.2 Policy responses and their outcomes

1. National wetland policy 2003 -
2. National Park Act and regulation
3. Ramsar sites - ghoda ghodi and
4. Forest policies (MFPS 1989)
5. Irrigation policy
6. Electricity policy
7. Drinking water policy
8. NBS Strategy 2002

## 2.3. Stakeholder strategies

- Highlight spiritual value
- Policy advocacy
- Piloting conservation and sustainable use in two Ramsar sites
- Research and knowledge and then advocacy
- Funding support

## Present Role

- Facilitation
- Fund distribution/donor
- Knowledge generation/dissemination
- Change agent

## Gaps

- Practical implementation
- Information/knowledge on wetlands
- Lack of coordination among the concerned agencies and knowledge sharing

## Need / Aspiration

- Inventory and status of wetlands
- Training of human resources/capital
- Sectoral coordination
- Policy environment
- Strategic environment assessment e.g. Karnali for hydropower or Dolphin conservation
- Research and development



**National Workshop on Ecosystem Services and Poverty Alleviation in South Asia  
(ESPASSA): Pakistan Situation Analysis**



**January 21, 2007**

**Organizers: Sustainable Development Policy Institute-SUNGI-IUCN**

**Project sponsors**

**NERC, ESRC, DFID-UK**

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**SDPI, PAKISTAN**

**BRAC, BANGLADESH**



## Workshop Agenda

The main objectives of the stakeholder workshop were:

- To provide forum through which dialogue could be established with key organizations/ individuals such as ecosystem managers, policy makers, experts in the field of ecosystem services and poverty.
- To provide the stakeholders with an opportunity to contribute to the situation analyses.
- Dialogues among the stakeholders would result in a more accurate and acceptable report that could be used for policy-making

### Workshop Programme

8:30 – 9:00 Registration

#### **Session 1: Welcome and Introduction**

9:00 – 9:10 Welcome address by Mr. Sohail Malik, Country Representative, IUCN

9:15 – 9:20 Self introductions by participants

9:20 – 10:20 ESPA project overview, concepts and key research issues  
Pakistan Situation Analysis (Shaheen Rafi Khan, SDPI)

10:20 – 10:40 Feedback/discussion

**10:40 – 11:00 Tea break**

#### **Session II: Panel Discussion: Experience Sharing on Ecosystem Management, Poverty Alleviation, and Public Policy Process in Pakistan**

11:00 – 12:30 **Chair: Dr. Bashir Vani, Inspector-General, Forests**

##### Panelists

1. Dr. Iqbal Sial, Managing Director, Forest Development Corporation: *Legal, policy and capacity building issues*
2. Dr. Babar Shahbaz, Research Associate, NCCR, SDPI: *Links between ecosystem services and livelihoods – An institutional and policy response*
3. Dr. Urs Geiser, Senior Research Fellow, University of Zurich: *Key drivers of ecosystem change and poverty impacts*
4. Mohammed Ismail, Program Officer ADB and journalist: *Key drivers of ecosystem change and poverty impacts in Northern Areas*
5. Sanaullah Khan, DFO and project manager, NWFP forest Department: *Experiences from the field*
6. Riaz Mohammed Khan, President, Sarhad Awami Forestry Ittehad: *Policy advocacy and resource rights issues*

12:00 – 12:30 Feedback/discussion

**12:30 – 13:30 Lunch break**

#### **Session III: Group work**



13:30 – 13:45	Explanation of 5 themes. Selection of group leaders to moderate thematic sessions ( <i>30 minutes for each theme</i> )
13:45 – 15:15	Theme 1: Stakeholder identification and ranking by interest
Theme 2: Establishing links between ecosystem services and human well being/livelihoods	
	Theme 3: Key drivers of ecosystem change and poverty impacts
<b>15:15 – 15.30</b>	<b>Tea break</b>
<b>Session IV:</b>	<b>Group work continues</b>
15:30 – 16:30	Theme 4: Legal, policy, capacity building issues
	Theme 5: Identifying information gaps
Session V:	Group presentations
16:30 – 17:45	Group presentations (15 minutes each)
<b>17:45 – 18:00</b>	<b>Concluding remarks</b>

***See Annex 2 for the participants list***



## SESSION 1

### **Welcome Address: Dr. Sohail Malik, Country representative, IUCN**

IUCN converging interests with the CEESP mechanisms and instruments sees in the situation analysis. Both attempt to bring us closer towards a constructive framework for national and international cooperation, aimed at ensuing enhanced ecosystem and livelihoods security

Ecosystems are under increasing threat. They provide the basis for human survival and well being, especially for vulnerable groups. The life sustaining services are provisioning, regulating and cultural.

We are aware of the causes of degradation, which need to be addressed on an urgent basis. Even though we can't live without well functioning ecosystems, we take them for granted – using them whenever, wherever, however we want to. Yet, demographic and economic growth is incessant; coupled with rising living standards and expectations; the demand for various ecosystem goods and services grows incessantly. The hard scientific evidence and day to day observations indicate that many ecosystems have reached their tolerance limits. Against all this, our care, stewardship and investments in ecosystems are not keeping pace. We need to take concrete steps for sound ecosystem governance. IUCN, SDPI, SUNGI and all partner organizations sitting around table, be they government agencies, civil society organizations, international organizations, need to work together through converging our interests and actions, so we come up with governance mechanisms, property rights systems, policies, laws, plans, programs, projects and various other instruments for better management of our ecosystems.

I conclude by saying not only do I see interdependence between environment and poverty, but also in our partnerships and actions in this regard. Therefore, I call on all of to strengthen our resolve and keep up our dialogue and cooperation.

*Dr. Shaheen Rafi Khan, Research Fellow, SDPI*

See presentation in Annex 1.

### **Questions:**

- Q. Poor people found in the predominantly afforested areas. But you also say poor people don't degrade these resources. Then who does?
- A. Agree, can't generalize results of a case study across Pakistan. But in Mata and Dir-Kohistan, found poverty was not the key driver of degradation: it was institutions: poor governance and mismanagement. To the extent that poor people did degrade resources, it was because they were forced to do so by the inequities underpinning management, not as a voluntary act.
- Q. Don't confuse Northern Areas (NA) and northern Pakistan. NA designated in nomenclature for Gilgit Baltistan, a different administrative entity. Such confusion can be dangerous. For instance, the media misreported that the NAs had been hit by the earthquake. This was incorrect but, consequently, such misreporting disrupted tourism, trekking and climbing. It hurt local economy for 2 years.
- A. Acknowledge and apologize for not making the distinction. For your information we are looking at 4 administrative entities – the NWFP, the NA, Federally Administered Tribal Areas (FATA) and Provincially Administered Tribal Areas (PATA). Having said that, there is evidence of extensive logging along the Karakorum highway.
- Q. The Karakorum highway has created seasonal effects. Local, able bodied residents working down country, return during the summer months. Essentially, a non-natural resource dependent community in terms of livelihoods, they exert pressure on local ecosystems for their subsistence, which imposes a strain on the ecosystem's carrying capacity. Need to determine these impacts, in relation to markets and to natural resource management (NRM).



- A. Would like to increment that question. As a result of exposure to the outside world, cognitive perceptions have changed. Dependence on local natural resources has reduced. Migrant communities are prone to degrade and pollute them, since it is no longer a critical lifeline in relation to their livelihoods.
- Q. Is your zoning approach to the study appropriate? Wouldn't it have been better to segregate the valley bottom, hill slopes and hill tops? The land owners reside in the valley bottom – whether low or high. The hill slopes and hill tops tend to be occupied by tenants (on marginal lands).
- A. I think there is a convergence here if you look carefully at the study.
- Q. You have shown a weak relationship between income and resource dependence. When we talk about multi-causality sometimes standard econometric techniques are unable to capture the one-sided relationship. There are advanced techniques available but it's only possible to use them when one has elaborate data. Also, wanted to point out that when we talk about poor areas, there is no formal employment in these areas, so definition of income becomes very important. Finally, may have included other variables in the model which might be picking up some of the income effects.
- A. The answer is two-fold answer. First, global studies point to indeterminate results. Regarding income suppressing variables, we have adjusted for that in the two-stage econometric approach we have used.
- Q. Dividing environmental drivers into two categories; anthropogenic and natural. Lumped climate change into natural but that is not entirely true. Can control climate change to some extent.

With regard to the poverty-environment (PE) nexus, the relationship is not a uni-directional relationship; it occurs simultaneously. Therefore a point-in-time study can not capture this dynamic relationship. Further livestock and income are related in that livestock generates income. So the weak explanatory power of income could be weak because of this linkage. All depends on the model specification.

Second, there is a high incidence of poverty in the southern Punjab. The potential link there merits a study also.

Third, getting prices right. In principal, don't disagree. It leads to the prescription to eliminate subsidies. But why subsidies in the first place? Could also lead to an increase in agricultural productivity. So, on the one hand, a subsidy generates a benefit; on the other it engenders other resource degradation as a negative outcome. Need to determine the net impact.

- A. There is another dimension which people don't pay attention to. Who gets the subsidy? Poor farmers don't get them. In fact, they are prepared to pay market prices if they would just get the water. So what is of concern here is the divergence between de jure and de facto subsidies. Take the example of energy. Oil prices are reaching USD 100 per barrel. So, in that sense, the subsidies are gone.

Re. PE nexus agree with you and did explain it in dynamic terms as a self-perpetuating cycle. However, the static analysis is justified inasmuch as we have looked at only one side of the loop, namely the impact of poverty on degradation. An attempt to establish such a causal relation has been attempted in many global studies. Further, while, conceding the need for rigor (and if you look at the study carefully, we have attempted to be rigorous), one of the conclusions of the study is equally important, which cuts across income distinctions and attributes degradation to institutional and management factors. This is fairly overarching across ecosystems.

Agree that there are other ecosystems where the PE linkages need to be examined, such as in Southern Punjab (agro. ecosystem) and in the coastal fisheries belt.

- Q. You referred to public-private partnerships. How do they help in removing market distortions?



A. Strictly speaking, they don't. We have referred to them as a possible management option. Traditional forms of forest management are not arresting deforestation. So, FAO-and the Environment Ministry (MoE) launched this initiative. They envisaged the possibility of the government entering into partnerships with the private sector through various kinds of mechanisms/arrangements – leasing, contracting and other kinds of collaborative arrangements. The guiding principles for these partnerships were clearly defined community resource rights and sustainable and equitable resource use. Towards this end, and under contract to the MoE-FAO, SDPI has formulated a draft PPP strategy.

Q Agree with the findings of the study which show that it is not the communities but policies and disputes that are contributing to degradation. Also, please incorporate the new administrative changes in the Northern Areas in the report.

In the three Kohistan, resource rights are well established in that the forests are communally owned. But deforestation is still very much in evidence. These are poverty stricken and remote areas where livelihood options are limited. Communities depend mainly on natural resources, especially for their energy needs. In the absence of alternative fuels, forests bear the brunt of meeting these needs. In Kalam, a family on average burns 70 cu. meters of deodar timber annually.

The forests are providing environmental services in the form of water and energy. But nothing is being injected in those areas to remove poverty. The result is degradation. Also, communities do not realize the value of the services the forests provide downstream. So while I agree with you that resource rights are an issue in your case study area, in other areas poverty is also a major factor in degradation.

A. You are talking about external interventions: providing alternative sources of energy, livelihoods options for local communities, infrastructure investments. But it never happens. The fundamental question that comes to mind is if the poor are occupying a certain ecological space, then isn't it self-evident that they will do every thing possible to preserve it – not only for themselves, but for future generations as well that will draw their sustenance from that ecological space. So what is it that causes them to degrade it? Is it anarchy, a management problem, an institutional problem? We need to continue looking into these issues.

Q. Would like to add another dimension. There is a supply and demand aspect with respect to natural resources. Demand is growing continuously but supply base is not expanding. The reasons for the latter are two-fold. First, tenuous resource rights, combined with the long-gestation period required for these resources to yield returns makes communities unwilling to invest in these resources. This is complemented by lack of investment on the government side.

A. Agree.

Q The study's value would increase, if it referred to other studies done on the same subject, some in collaboration with the MoE.

A. Agree. Need to get more references and look at more evidence before we finalize.

Q A similar study done in the Northern Areas by a foreign institute. It looks at population, rather than poverty as a possible driver. However, it comes to the same conclusion – that degradation is institutionally rooted. Should incorporate these findings in your study.

A. OK.

Q. The *wesh* system (circulatory tenure) prevailed in Kala Dhaka (near Tarbel Dam), a remote area a few decades ago. The land rotations were among seven tribes left the resource base in a better position. So when we talk about resource rights, poverty, competition, as sources of degradation, we could do well to reflect on these traditional conservation practices. Thus, why, when the tribes were mobile, did they behave so responsibly? Such traditional practices could well give us insight into the governance issues we are talking about. However, it is



possible that such practices may have been adapted/changed with population growth and development. These suggest the need for another study

## **SESSION 2: PANEL DISCUSSION**

### *1. Dr. Iqbal Sial, MD FDC: Legal, policy and capacity building issues*

My talk focuses on good governance issues, which I try and link with the policy reform process undertaken in the NWFP. In the context of the study, I have tried to highlight the resource degradation problem. The most fundamental issue is tenurial and this has been highlighted in the study.

The second largest issue is governance. The NWFP forest department has attempted to address it in the shape of institutional reforms. Its basic elements are:

*Policy formulation:* As a part of the institutional reform process, we developed the first provincial policy of the NWFP; the policy document is complete. The document emphasizes public participation in NRM. However, as the system works, the policy provisions have not been taken seriously and, like many of its predecessors, the policy has become a shelf document. While the policy emphasizes that natural resources should not be viewed only as a source of income that, in fact, is the reality – as it was before the policy was formulated. Every year, increased revenue targets are established and forest department functionaries attempt to meet them. The ban on logging validates this. The ban was imposed in 1993. Data collected during pre and post ban periods indicates that the revenue targets for both periods are almost the same – underscoring the ineffectual nature of forest policy.

The second issue addressed was legal reforms. As you all know, the forestry legislative apparatus was formulated during the colonial period and remained in force until recently. This was changed under the institutional reform process, when the NWFP forest ordinance, 2002, replaced the 1927 Forest Act. Other related legislation, in the form of several acts, was also introduced and which was amalgamated into the forest ordinance.

Third, new rules and regulations rewritten and approved by the competent forum.

Fourth, several roundtables were put in place in different sectors, under the Sarhad Conservation Strategy, but only the forestry roundtable survives – although there are questions about its usefulness. Similarly, a Forestry Commission was established under the Forest Commission Act, after studying various models in other countries. However, the commission is an inept body, largely because of political interference.

I call all these initiatives peripheral reforms. The core of the reforms was the reorganization - or reformation, of the forestry department itself. A number of initiatives were key in this regard: formulation of integrated specialized units on HRD; R&D; community development; monitoring and planning and; recently, promotion of NTFPs – with independent directors and staff. The hope was these specialized units would interact with traditional management units, in a matrix system of management. A lot of input and efforts was needed to make them fully operational. Finance is a fundamental constraint. The whole institutional reform process was funded by the ADB, Forestry Reform Project. The project is over, so the financial support is no longer forthcoming and the provincial exchequer is not prepared to step in.

The fundamental unit in the reform process is the forest division, which is headed by a DFO. These divisions still work in the traditional manner. Although participatory management has been plugged in and community development staff has been posted in forest divisions, tasked with working in an integrated manner with field management units, there is still a long way to go. The management psyche is still traditional. Essentially, institutional reform in one sector, will not work in isolation. It is linked with governance at the macro/national level.

My next point concerns valuation of benefits. Ecosystem services have been identified in the report, but the valuation part has been left incomplete in the report. The MoE has taken initial steps to place a value on services. This will help in planning and in attracting funds for conservation. A linked issue is the benefits of conservation. These accrue in the plains – away from the source, and they take the form of flood control, drought mitigation and energy production. The beneficiaries do not pay back. In



fact, the benefits perversely accrue to loggers who degrade the forests. There is no institutional mechanism to benefit those who conserve resources. Ultimately it is a political issue; the hold of the mafia is strong. However, resistance and agitation should continue, as in foras such as this and by NGOs.

Finally, I refer to the logging ban. There is no thinking behind it – it has just put a lock on the system and in my opinion has not worked. The Swiss Development Cooperation (SDC) and the NWFP FD have launched a study to assess the impacts of the ban and, hopefully, we will get some insights into this issue.

2. *Dr. Babar Shahbaz, Research Associate, NCCR-SDPI: Links between ecosystem services and livelihoods – An institutional and policy response*

Definitionally, it is important to make a distinction between natural forests and plantations. The latter are not forests. Natural forests have entire ecosystems associated with them, with trees, species and people. These natural forests, mostly located in the NWFP and the Northern Areas are depleting rapidly. According to an FAO report, 39,000 hectares are vanishing annually – at the rate of 1.5 percent per annum.

Degradation is occurring despite donor efforts. We made an inventory of donor-funded projects over the past decade. About 60 mega and medium sized, multi-million dollar projects have been implemented mostly in upland areas. These are still being depleted – in fact, at a rate that is among the highest in the world. Understandably, there are some success stories.

We look at some of the reasons from the livelihoods perspective. Our premise is that the state alone can not alone effectively manage forests. Both researchers and development practitioners emphasize the importance of local community involvement for sustainable forest management and livelihood security for those who depend on the forests. There is a close relationship between livelihood outcomes and livelihood assets and these are linked through livelihood strategies. DIFID has developed an analytical framework for this, with the assets 'pentagon' in the middle, consisting of human, natural, social, financial, physical assets. Our research in Swat and Mansehra has focused on natural and social assets.

Forests provide natural resources to people living in and around them, in terms of subsistence and livelihoods. Based on these assets, people develop their livelihood strategies. This is driven by perceived livelihood outcomes -- in terms of what they want to achieve. Further, these assets are affected by policies and institutions.

The most important priority for people was financial security, income security, food security and physical infrastructure. Lacking financial and physical assets the livelihood strategy they adopted was migration (male family members mainly to Karachi) and small family businesses. Dependence on remittances was high. Subsequently, we concluded that forest degradation was not an outcome of poverty since communities did not depend on forest resources for livelihood income. Their inroads into the forests were comparatively modest, mostly to meet subsistence needs (fuel wood, construction timber, energy, fodder, NTFPs), compared to commercial inroads into the forests.

However, communities could not be dissociated entirely from deforestation activities. This tendency was institutionally rooted. The FD has conservation and revenue extraction as its priority. It tends to ignore the subsistence needs of communities. Essentially, there is a mismatch between expectations and delivery. Institutionally, communities find it difficult to access the forest as it involves a hierarchy of many processes. Therefore, they are forced to use informal mechanisms (illegal). There is a notable lack of trust between state and non-state actors which is historically rooted. Civil society (NGOs, *jirgas* and religious groups) is trying to operate within this contested political space. The reform process under the Forestry Sector Project (FSP) has not engaged with these groups and these entities, themselves, are not in a position to initiate change.

Our main research finding is that the present over-exploitation of forests is not caused by population pressure or unaware people but needs to be understood as an unintended consequence of post-colonial governance conflict. The value of local *riwaj* (traditions) as in the *wesh* system have not been given due cognizance by the state. In short, the reform process has essentially been donor-driven.



The donors are not aware of the underlying tension between state and non-state actors and between customary regulations and the traditional approach of the forest department.

I end with the comment that the institutional reforms seem good on paper but the psyche has not changed in the FD. Also, the FD is not fully supportive of the participatory approach – for one thing it is an additional responsibility for them and they are expected to do it without the benefit of incentives.

3. *Professor Urs Geiser, Senior researcher, Zurich University. Key drivers of ecosystem change and poverty impacts*

I start by asking 'key drivers of what?' Have to reflect briefly on 2-3 words we talk about. The first is ecosystem services; the second is degradation and; third, who are the culprits? I end with recommendations, which this workshop focuses on.

*Ecosystem services:* Simply put, this means what we take from nature for our living. These are used by everybody, regardless of level of income – everyone needs food and water, cars emit CO<sub>2</sub> which is absorbed by the forests – so everyone benefits. The question is are there specific services used by the poor? That becomes both interesting and difficult. Perhaps, the poor use more of land and more of forests, but if you look at the really poor, they don't even have land. The use of services is determined by those who own the resources and this brings us into tenure questions. If we focus on the poor, we risk ignoring the rich and the middle class who use the majority of the services.

*Ecosystem degradation:* What does it mean? Needs reflection. There is sometimes a change from one ecosystem to the other. Some people like this change, others don't. So when does a change constitute degradation? For example, when forests are converted to agricultural fields? For me this constitutes a change provided the land is looked after properly – there is crop variety and rotation. So we need to be careful in our use of the word. In the case of Swat, there is clear mining of forests. The degraded areas are not replanted, or put to any other use.

*What are the forces behind it:* The idea that poor degrade resources is still very prominent. But studies have questioned this. It could be a function of location in the forests and this cuts across poor, medium income and rich people – who all use forest resources. Do the poor people use more? Clearly, they need subsistence resources. But it's what people take above subsistence needs is what causes degradation. This is where outside markets come in – for instance for timber. The poor do get involved in such extraction, but through the activities of the outside agents (the mafia), rather than through an internally generated momentum.

Sure, there are knowledge gaps and in the plains, in the southern Punjab, the poor may be playing an active role in degradation.

However, confining ourselves to forests, we need to step away from the blame game and examine the underlying causes. The supply-demand gap comes to mind. In the absence of alternatives, this gap will increase – people near the forests will use these resources. Second, there is the governance-institutional issue; there are shortcomings in the governance system, which I won't repeat, but they need to be addressed.

*Recommendations:* First, there are knowledge gaps we need to look into. For instance, how do the resource-dependent, poor people in the lower Punjab interact with their resources? However, at the end of the day, we all want to go to the recommendations. In short, how do we improve the situation? Having said that, there is the risk of coming up with general recommendations. For instance, we need participatory forest management; get prices right; governance needs to be improved. These recommendations have been repeated ad nauseam since 20 years. We need an intermediary phase to determine why these recommendations have or have not been implemented – what are the enabling or disabling conditions. We need to look in more detail into how the system works. This is a necessary analysis but needs careful collaboration between the stakeholders (researchers and the executing agencies) because of the sensitivities involved. We do not need to get into a blame game.

At the end of the day, ecosystem services have to do with access and who controls it. The issue of the need to pay for services is also important.



4. *Mohammed Ismail, Program Officer ADB and journalist: Key drivers of ecosystem change and poverty impacts in the Northern Areas*

The NAs start from Basha-Diamer to Siachen in the extreme north, touching Ladakh in India, in Indian-held Kashmir. They also borders with China and Afghanistan. They have an area of 74 thousand square kilometers, which is only 2000 km less than the NWFP. The Karakorum highway passes through the region.

I will not talk about forestry as the NA's forests have been severely depleted and, presently, cover only 3 per cent of the total area which, basically, is a barren, high altitude desert. The cultivated area is around one per cent. Add another one per cent of cultivable land if water resources are properly harnessed. So the scope for agriculture and forestry is rather limited. Nonetheless, the ecology of the NAs is extremely vital for Pakistan. When I talk about ecology or ecosystems, I am referring to water, air and land and the life forms that subsist on these three components, including human beings. In particular, the ecology is critically important for the Punjab and the Sindh, which rely on the Indus river system for irrigation.

Before partition, the NAs were comprised of little administrative units – kingdoms ruled by local rajahs, who reported to the maharajah of Kashmir. The Gilgit agency was under the direct administrative control of the British for a while. After partition, Baltistan, which was part of the Ladakh *vizarat*, became a part of Pakistan. Interaction was limited; from Gilgit to Khunjerab, after every 40 to 50 kilometers, there is a new language. In Gilgit, the language is *shina*; in Hunza *bushiski*; upper Hunza or Gojal, speak *wakhi*; in Baltistan, the language is *balti*, which is more of a Tibetan archaic language. These were small locked in communities, depending on their natural resources for subsistence. Obviously, conservation was something they had been practicing for many centuries.

A number of factors have changed the ecosystem of the region over the past few decades:

*The Karakorum highway (KKH):* The highway has changed cognitive perceptions. It has brought in new products – vehicles, Chinese toys, *banaspati* ghee. It has also triggered the export of valuable local products. The people lived on specific local diets. Materially, they were very poor but lived content and self-assured lives. After the KKH, things unraveled very quickly. Down-country job opportunities emerged. The barter economy began to switch to a cash economy, relying on imports from down country, leading to dramatic lifestyle changes. Apricot oil began to be sold for high prices and locals substituted it with *banaspati*. In general, the intake of adulterated, health-damaging foods increased. While health facilities have improved, people are encountering new health challenges.

The KKH has increased tourist inflows and created new types of supporting economies but it has also created air, water and waste pollution, for instance in the Baltoro glacier and in the base camp of Nanga Parbat.

*Military infrastructure:* India moved on to the Siachen glacier in 1984. The Pakistan army countered with its own force and subsequently, new road infrastructure has been constructed. This has resulted in harmful impacts on the ecosystem. The glacier is the largest outside the poles and has becoming a depository for oil and other non-biodegradable products. The two countries should resolve their differences and the glacier should be brought under the Central Karakorum National Park – making it a cross-border initiative.

*NGO Movement:* The NGO movement came in a big way to bring about local economic and social development. Particularly the Agha Khan Development Network (AKDN) established itself in areas with an *Ismaili* (followers of the Agha Khan) majority. Later they also expanded to Baltistan and parts of Astore. These areas have experienced short term, donor-driven benefits but their activities also have some adverse long-term implications.

The government has also injected a lot of money in infrastructure and other development work. The positive impacts are particularly evident in the social sectors – in education, 100% literacy has been achieved in some areas.

*Capacity gaps in governance:* Unable to manage the changes taking place. For one thing, people don't have a say in the formulation of policies. For example, they were not consulted in the decision to



construct Basha dam in the Diamer district. It created resentment among them that they were excluded from a process which made decisions about them.

Administrative ambivalence is also another problem. The donors don't know where to park funds. The MoE is responsible for protected areas (Pas) and national parks but funds for their upkeep are preempted by the Kashmir Affairs ministry. Further, the MoE has no coordination role with the NA administration in Gilgit. These anomalies and lack of institutional capacity is hampering ecosystem management. Customary law, under which the few forests in Diamer were managed, has given way to statutory law. But this has neither been codified, nor are there management plans in place. The timber lying on the KKH has been lying there for many years and the summary is still pending in the PM's secretariat.

*Climate change:* Out migration has taken place from many villages because the glaciers feeding the rivers and streams have dried up. Increasing population means more vehicles and, in turn, more vehicle emissions.

*Lack of knowledge:* The lack of knowledge about the NAs and its importance at the national scale is alarming. Need more data/information about the glacier resources. Need to quantify and have strategies mechanism to conserve them and to minimize climate change risks. Lack of knowledge within the NAs also an issue although several IUCN and WWF initiatives have raised awareness. But not enough. Need to translate into policy action.

*Population growth:* The populations was growing at the rate of 2.7 per cent, primarily reflecting in-migration from the NWFP, due to business opportunities opening up through trade with China.

*Market forces:* Resource degradation is also driven by market forces. Extraction of herbal medicines from meadows in Astore and Deosai is going on unchecked. The FD is trying to control this but its capacity is limited.

For the South Asia study the NAs are a macrocosm of what is happening in the entire region.

#### 5. *Sanaullah Khan, DFO and project manager: Experiences from the field*

The NWFP adopted a robust forest policy in 1999 under the legal reforms. Previously, a national forest policy was being implemented across the country. But it was realized that forests would be better managed at the provincial level. So under the legal reforms, forestry was declared a provincial subject. The NWFP Forest Policy followed in 1999 and the NWFP Forest ordinance in 2002. Under this ordinance, forest regulations were also framed, like JFMC rules, Community Participation Rules etc.

The reforms had their genesis in the FSP (1992), which funded several donor projects, mainly in the NWFP. The replicable and innovative aspects of these projects were then scaled up to the policy level.

The NWFP forest policy has two cardinal objectives. The first is participatory forest management, including all the stakeholders, such as forest owners, users, civil society, and line departments. A precondition for the participatory approach is a change in mindsets at every level. Second, forest officials need to be free of political fetters to promote unison between policy and practice. There is a political economy aspect to forest governance in the NWFP. Strong, politically entrenched interests resist change, which drives a wedge between people-oriented forest policies and their implementation. Institutions have decayed over time. Therefore a crash capacity and institution-building program is needed. For that we need financial resources. After FSP came to an end, a financial crunch took place, stopping the reform and institutional development process stopped.

Second, an integrated approach is required to conserve or sustainably manage the forests. The basic premise is that all the resources are interdependent, so the approach to managing them has to be holistic. Also, unless sustainable livelihoods are developed for forest dependent communities, the forests will continue to be degraded. Related to this is the development of social, human, natural, physical and financial capital. To make this work, need the full cooperation of the various line departments. No mechanism has developed yet to bring about this integration.



Regarding the ban on logging, a carrot and stick approach is needed; unless restrictions are accompanied by incentives, ban violations will continue to occur.

Over-all, strong political will is required for the reforms to succeed. There needs to be a continuity of the government and policies. The FD's JFMC is a good community participation initiative. But it needs a crash program of capacity building and awareness creation at many levels, from communities to policy-makers. Ultimately, the environment should be integrated into mainstream economic policies. The Environment Protection Act, 1997, is in place but its implementation is wanting. Basically, the policies, tools, reforms are there and, to an extent, implementation is underway. But there is still a long way to go before this robust forest policy becomes operational.

6. *Riaz Mohammed, President SAFI: Policy advocacy and resource rights issues*

Ecosystems are being destroyed because institutions are being destroyed. Due to political interference, non-forestry people are being appointed in key positions and departments are not being allowed to work. Profits are another factor, giving rise to mafias which the government is not able to rein in. They bribe, threaten, destroy departments and degrade the environment. Their vested interests are promoted by undermining institutions and destroying the resource base. Many of them are in prominent political positions.

The NWFP has three kinds of forests: guzara; reserve; mazrui (outside demarcation). Before partition forest laws were respected and the FD had authority. However, this authority has collapsed. To compound the problem, policies keep changing: the contractor system was replaced by the FDC; forest cooperatives were established; now JFM has been instituted. We have forestry Commissions and roundtables. None of these constructions has worked; either their original intent has been subverted through appointing the wrong people (Forestry Commission), or they are being manipulated by vested interests. The only way these initiatives can work is if all the stakeholders are involved in dialogues/consultations, decision-making and implementation.

All the NWFP rivers, famous for their fish species, are now polluted via waste disposal. Industrial waste is going into rivers and effluents are reaching the sea.

Regarding the PE nexus, the rich depend on these resources as much as the poor do. But while the rich can access these resources, the poor can't. SAFI has been lobbying for the resource rights of the poor. All the stakeholders need to be brought together, including those who prey upon these resources so that, collectively, they can come up with sustainable solutions.

### **Questions and observations**

Q *Apropos the presentation on NAs, can a local economy be built around medicinal plants to benefit local communities?*

A. Since cultivable land is limited, the challenge is to promote sustainable extraction of herbal plants, which NGOs and local communities are attempting to do. NTFPs are a source of subsistence, income and medicines for the poor. The collection and processing is done primarily by women and children. Not only should these plants be conserved *in situ* but their cultivation should also be encouraged as they a niche/growth potential in the mountain areas which the poor can capitalize on, and they offer excellent export prospects. Sea buckthorn has potential markets in China and Europe.

The poor also collect seed of various confers (chir, diar) which they are forced to sell at very low prices in the market. For some families, these transactions are an important livelihood source. A mechanism needs to be established to ensure they get a fair price.

Other initiatives, like organic farming, also have assessed export potential. However, these are pilot initiatives and are far from being the mainstay of livelihoods for local communities. Uncultivable land is mostly 'khalsa sarkar' (government land), which can be cultivated if water is made available but the possibilities are limited



- Q. Regarding the lack of commitment/implementation of forest reforms, our impression is there is strong collusion between forest department staff and prominent politicians. It is not possible to smuggle out timber without such collusion.

The SAFI president advocated strict enforcement of laws. Such laws have their genesis in the colonial era; their purpose was to restrict use of forest resources for their own use – e.g. timber for railroad sleepers and construction of cantonments. Community rights to forest resources were circumscribed. The situation did not change post-partition. Therefore, SAFI should be careful about advocating the need for such enforcement because such enforcement is, inherently, anti-people.

In this context, and with reference to JFMC, management is still unwilling to accept communities as equal partners in management. It is a good model, being implemented in India and Nepal but a complete failure in Pakistan. The FD is responsible for this failure.

- A. The NWFP FD is the pioneers in the forestry reform process. Rather than being appreciated the FD is being targeted. No one talks about the Murree, AJ&K or NA forest department. However, criticism is natural provided it is fair. Regarding collusion, consider timber harvesting in Indus Kohistan after the logging ban was imposed in 1993. What one tends to forget is that these forests belong to forest dwellers – ownership is both communal and private. Only six per cent of the forests are state-owned. The communities depend on these forests for their livelihoods. So what would one expect the consequences of the ban to be? In Kohistan during the ban period 6 lakhs cu.ft have been cut. The FD was unable to prevent this. Kohistani culture is a tribal culture and their writ runs in their areas – all they have to do is block the KKH. However, despite this, the FD confiscated this timber, forbidding its movement. Three forest conservators submitted this proposal successively, on the premise that if this timber was moved down country, the communities would be encouraged to cut more timber and bring it down to the KKH. But the political government, needing its vote bank, thrice gave permission to remove the timber; of course, this resulted in more timber being cut. So, it's not a matter of collusion, a political writ overrides administrative fiat.

A second example is the import of Afghan timber. Historically, such trade has taken place through the Parachinar, Khyber routes. These markets were established before partition. Lately the provincial government provided another route via Dir-Samarbagh. Despite the FD's resistance. Consequently, Chitral's natural forests have been degraded. Again, it's not a case of collusion; the politicians' writ runs rampant.

Re. JFM the NWFP FD has played a pioneering role – instituted new policies, acts and rules. However, we concede the institutional reform process is not complete; therefore, participatory management practices are not fully on board. Wish to point out that local communities are also susceptible to corruption. Whoever gets an opportunity will cash in on it. For instance, certain elements began capitalizing on the money-making opportunities forestry cooperatives offered. Similarly, the JFMCs are susceptible.

Wish to emphasize that it is not the laws that are rigid or inflexible but that laws tend not to be enforced. SAFI installed check posts in tandem with the FD in Swat, to stop the movement of illegal timber, and it worked because the mafia feared community censure. In other words, there was an 'awami not qanooni danda (the stick was wielded by the people not the government).' SAFI is also educating and creating awareness.

Should be careful not to enter into a blame game. SAFI blames the FD; the FD blames the politicians but the politicians are the government. Who imposed the ban? There were no politicians around then.

Why are there lapses in policy implementation? One needs to understand the political, legal, economic and institutional context. Provide these enabling conditions and then hold the FD accountable, rather than entering into a mindless blame game. Second, law enforcement has nothing to do with whether it is a colonial measure or not; in the west law infringement leads



to penalties. That ensures proper implementation. Here political interference or capacity constraints prevent such enforcement.

Second, property rights are key -- need to define and secure peoples' property rights, otherwise forests will degrade. So fairness with respect to people's entitlements and strictness with respect to law enforcement are the touchstone for good forest governance.

There is another element which overrides laws. In the Punjab and Sindh, forest land has been acquired forcibly by the army and converted to agricultural land. In contrast, recent law in India lays down that not an inch of forest land can be converted to non-forestry uses.

- Q. The FD claims the NWFP is a pioneer in forest governance. We are not criticizing the FD, rather voicing our expectations. The reforms failed basically because they lacked ownership in the departments. They were externally imposed and only effected cosmetic changes. Presently, an alarming trend is emerging; the reforms are back-tracking towards traditional, control-oriented management. As evidence of this, the Forestry Commission is being subverted from its original intent to independently formulate forest policy and regulations; JFMCs are still beholden to contractors for the extraction and transport of timber; round tables are dysfunctional. Following the devolution of powers, forest magistrates had been disbanded; now they have been reinstituted. All these facts boil down to lack of reform ownership. Ultimately, conservation and income generation can't go hand in hand. Clearly, the primary objective of the FD is income generation.

While concede that communal/private ownership is widespread in the three Kohistan's, the control, nevertheless, resides with the FD.

At the end of the day, there is an absence of accountability. All the stakeholders feel disempowered and blame each other. What are the accountability mechanisms?

- A. Institutional reform is a process of change and we are attempting to undertake it in a department which is more than a hundred years old with a specific culture. Difficult to change this culture in a short time. Even in the private sector, there is resistance to change, known as institutional inertia. The FD established management cell to overcome this. Should have been a continuous, on-going process. However the donors have gone and the NWFP government has not sustained the effort. So, policy reform reversals are beginning to occur. Finally, we lack the political will to carry these reforms forward.

- Q. Blue pines are disappearing in the Siran valley. By the time the reforms take effect, will any trees be left?

- A. The ban on timber harvesting should have been imposed in conjunction with other initiatives. As originally envisaged, the idea was to set up a revolving fund, undertake integrated management and institute timber marketing and import arrangements. However, none of these initiatives was taken, with the result that the ban became infructuous – the large supply-demand gap has condemned it to failure.

Re. JFM, the FD started an initiative in Allai. It did not involve large owners but went to the poorest of the poor. The project director (PD) approached SUNGI to help start a credit scheme. In its absence, and being financially vulnerable, the communities would sell their royalties to the mafia (contractors) and the situation would revert back to the cooperative system with its inequities. SUNGI refused. Then the PD went to the Muslim Commercial Bank and they refused. No one helped, including civil society. It appears civil society, too, is just interested in getting projects. Everyone asks for privileges but no one takes responsibilities.

- Q. Pakistan has no institutions, it has lobbies and when these become strong, they become mafias. A lobby develops a sectoral law; it then searches ex post for a context – social, political, economic - to make that law implementable. This is an inbuilt flaw, not only in the forest department but in our general behavior as well. To have effective institutions and policies, the context should precede the initiative ex ante – as in the case of developed countries?



Users look with doubt at two things – family planning and conservation. Both have restraint connotations. In other words, public and private benefits clash. The market economy pushes for more private benefits; concurrently, institutions meant to protect the forests are degrading daily. So how does one persuade a forest user to reduce his livestock herds, refrain from cutting trees etc., unless one can provide him alternatives?

- Q. Most of the papers revolve around forestry. But ecosystems are much more than forestry. In the next workshop, care should be taken to include other areas.

Not all lobbies are negative. In international politics they have a positive role to play – they bring in resources; they raise agenda issues. However, absent an institutional framework, lobbies become mafias.

Mistrust between state and non-state actors. In the existing governance environment in Pakistan, how can that mistrust be allayed?

Ecosystem services need to be priced. But who is going to pay those prices? Poor people? Will they be able to pay? Or the rich quarters, who have already messed up the country?

- A. Mistrust between FD and the stakeholders can be resolved through dialogue, moderated by independent groups.

In addition, there are specific fields where additional knowledge needs to be generated to make these discussions even more informed. Prices are a complex field – benefits are generated for the entire country, for the people in the plains, but the forest communities who conserve are not rewarded – or are not given incentives to conserve. For instance, royalties for ecosystem services need to be instituted.

### ***Concluding remarks by chair (Dr. Bashir Wani)***

In discussions on ecosystem services, we need to go beyond forestry issues. In future, hopefully, there will be more workshops which will look at other ecosystems

Second, we need to focus more on climate change, especially in the light of its current and potential impacts on the Northern Areas, NWFP, AJ&K, the most vulnerable and ecologically rich areas. This was pointed out forcefully in a recent RAMSAR meeting.

The six presentations have highlighted a number of issues, relating to management, land tenure etc., which are creating problems for sustainable forest management.

There is an extended horizon to change. It has to be a gradual process in as much as it minimizes social and economic disruptions.

Hopefully, these discussions have set the stage, so that in future we have more discussions on subjects such as:

- ✓ What are the impacts of the ban on logging
- ✓ Broader discussion on ecosystem services
- ✓ Presentation of success stories (especially, biodiversity initiatives in NAs and the NWFP)

Conclude by thanking SDPI-SUNGI-IUCN for bringing together diverse stakeholders from the four provinces.

### **Session III: GROUP WORK**

#### **Theme 1: Stakeholder identification and ranking by interest**

Stakeholders	Role	Level of interest
Forest Department	Forest management and policy implementation	A



Wildlife Department	Conservation	B
Fisheries Department	Fisheries development	C
Livestock department	Production	C
Agriculture Department	Production	C
Ministry of Environment	Support coordination and facilitation	B
Law enforcement Agencies /Judiciary	Support	B
Finance and revenue	Support	B
FDC	Harvesting and marketing	B
Tourism	Tourism	C
PFI	Forest Education and research	B
Academia	Research and development	C
Water and power	Dams, power	B
Mineral Department	Exploration	C
Owners	Management and policy advocacy	A
Right holders	Ditto	A
Users	Ditto	A
Other beneficiaries	Ditto	B
Grazers	Ditto	A
Civil Society Organizations	Ditto	B
Donors	Funding and policy advocacy	C
Contractors	Management	B
Sawmills	Production	C
Transporters	Transport and management	C
Traders	Retail	C
Wood based industry	Production	C
Nursery Owners	Nursery production	C
<i>Politicians/legislators</i>	Policy formulation	A



**Theme 2: Establishing links between ecosystem services and human well being/livelihoods**

- Health
- Renewable source of livelihoods
- Forest and Ethno-botany
- Healthy ecosystem can generate better economic activities
- Lack of investment by local communities and the government
- Sustainable consumption (culture) is threatened because of other factors

**Theme #3: Key drivers of ecosystem change and poverty impacts**

Key drivers	Poverty impact
Ubiquitous grazing	Degradation of grazing lands and pastures leads to reduction in livestock holdings and extended search for new pastures
Sector wise approach to development	The poor try to get benefits out of ecosystems but can not participate in its development
Market economy	Increases livelihood sources and, concurrently,
Unclear Resource Rights	Restricted access to and usage of resources
Climate Change	Increased glacier melt leads to disruption of livelihoods, immediate flood threats and reduced water supplies in the long term
Demand Pressure	Indigenous community forced by demand to change their pattern thus inducing dependency
Unsustainable consumption	Degradation
Deforestation	Downstream flooding, land erosion, dam sedimentation
Population Growth	Leads to impoverishment and resource degradation
<i>Seasonal migration</i>	Return migrants put seasonal pressure on resources for subsistence use



#### Theme 4: Legal, policy, capacity building issues

Legal	Policy	Capacity building
Ownership/resource rights not clearly defined	Policies are forward looking but their implementation is inadequate/poor	An effective communication program should be launched
Discordance/lack of consistency between national, provincial and district laws	Civil society is not playing an effective role in policy formulation and advocacy	Capacity needs to be enhanced but this must be tested with real life scenarios
Forest legislation, especially its punitive clauses, have not kept pace with the present scenario (inflation among others)	Ecosystem/environment should be mainstreamed in the national decision/policy-making process	Awareness raising is urgently needed
Poor implementation of forest laws	Sectoral, as opposed to integrated policy for NRM	System for continuing education should be introduced and linked with promotion. Refresher training is not arranged to update knowledge and skills NRM education is not available in the country both at professional and technician level.
No legal arrangement for benefit sharing from forests. Existing royalty system iniquitous for certain ethnic groups and women.	Process of policy formulation at federal/provincial level is non-participatory (top down). No mechanisms to ensure implementation	Technical capacity needs to be enhanced
Regulations are there, but not implemented. There is need for new regulations Analyze root causes for lack of acceptance of regulations	Redundant policies and lack of accountability.	Extension/ outreach programs in NRM should be launched
No legal apparatus is available for land use planning	New policies are future oriented but what about the problems now. Immediate actions are required - who is responsible. Break the poverty cycle by regulating the forests	Capacity building of forest growers is required
No law for changing forest land use	Policies are non participatory	Forestry education at PFI is still colonial in style. It should be opened up in all universities as part of NRM facilities.
Adequate laws regulating ecosystem management are not available	Lack of financial resources	Lack of reliable data
Legal provisions for pricing environmental services (PES) from beneficiaries	Policy provisions for PES from beneficiaries	Capacity building for policy makers, communities and other key stakeholders for PES
Implementation of existing laws be assured	Lack of participation- no rights are given to direct stakeholders for their say (input). Lack of coordination between monitoring and implementation	

#### Theme 5: Identifying information gaps

- Research on impact of logging ban
- Research on institutional reforms- what went wrong and where?




- 
- Wider research on causes of degradation and possible solutions
  - Weak partnerships among stakeholders
  - Lack of trust and competitive approach
  - Explore appropriate zones for implementation of participatory action
  - Sectoral interactions and complementarities
  - GIS can be used for evaluation and planning of forests
  - Data
  - Lack of awareness
  - Lack of Coordination between guardians and beneficiaries
  - Advocacy campaigns are not community focused
-



## Annex 1: Country study presentation

*Ecosystem Services and Poverty Alleviation  
Study in South Asia (ESPASSA)*



Shaheen Rafi Khan  
January 21, 2008  
Sustainable Development Policy Institute

*Project description*

About the ESPA Project



- Collaborative study with regional and UK-based partner organizations
- Duration: August 2007 – February 2008
- Sponsors: NERC, DFID & SERC, all UK-based funding agencies
- Involves a 'situation analysis' of ecosystem services important to the well-being of the poor, including an assessment of information & knowledge needs

*What is a situation analysis?*

- The present state of the diverse ecosystems or landscapes in South Asia.
- The drivers of change in these landscapes.
- The linkage between ecosystem services, livelihoods and poverty
- The management context that governs, or affects these landscapes and;
- Last but not least, the 'information gaps.'

*Definitions: Ecosystems*

'A dynamic complex of plant, animal and microorganism communities and their non-living environment, interacting as a functional unit' – MEA

★ Usage limited:

- Does not lend itself to physical mapping
- Not easy to generate measures and indicators of ecosystem functions and values

*Alternative definition:  
Ecosystem services*

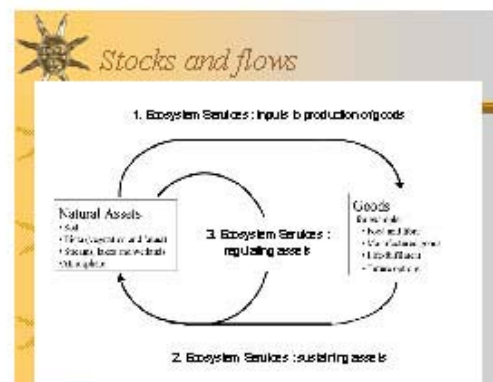
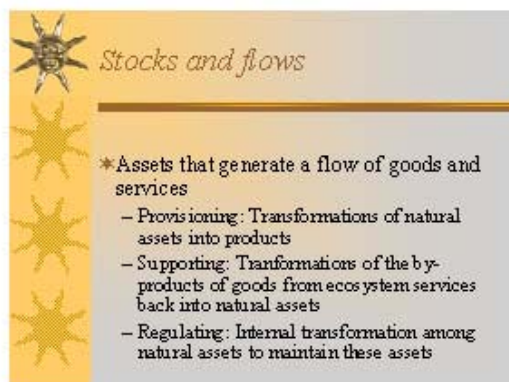
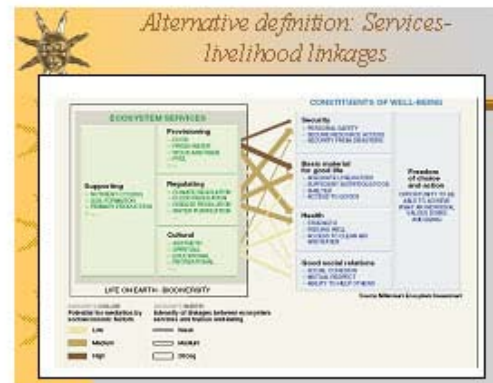
'ecosystem services are components of nature, directly enjoyed, consumed, or used to yield human well-being' (Boyd and Banzhaf 2006)

*Ecosystem services*

**Ecosystem service categories**

Provisioning	Regulating	Cultural	Supporting
<p>Goods and services that ensure human well-being</p> <ul style="list-style-type: none"> <li>- food, fiber, water, energy, other products</li> </ul>	<ul style="list-style-type: none"> <li>- Clean air and water</li> <li>- Reduced floods, droughts</li> <li>- Climate stabil.</li> <li>- Control disease transmission (incl. vector borne)</li> </ul>	<p>Non-material benefits</p> <ul style="list-style-type: none"> <li>- Aesthetic</li> <li>- Recreational</li> <li>- Educational</li> <li>- Cultural</li> <li>- Spiritual</li> </ul>	<p>Supporting services for the other three services</p> <ul style="list-style-type: none"> <li>- soil formation</li> <li>- nutrient cycl.</li> <li>- prim. product.</li> </ul>







# Pakistan Situation Analysis

Issue/Topic	Current Status	Target Status	Remarks
Deforestation & Land Use Change	Deforestation is ongoing at an estimated 1.5 million hectares per year. Land use change is also significant.	Deforestation should be stopped. Land use change should be controlled.	Deforestation is a major threat to biodiversity and ecosystem services. Land use change is also a major threat to biodiversity and ecosystem services.
Water Resources	Water resources are under increasing pressure due to population growth and climate change. Water quality is also declining.	Water resources should be protected and improved. Water quality should be maintained.	Water resources are a critical component of the ecosystem. Water quality is also a critical component of the ecosystem.
Wildlife	Wildlife is declining due to habitat loss and poaching. Many species are endangered.	Wildlife should be protected and conserved. Poaching should be stopped.	Wildlife is a key component of biodiversity. Poaching is a major threat to biodiversity.
Marine Resources	Marine resources are under increasing pressure due to overfishing and pollution. Marine biodiversity is also declining.	Marine resources should be protected and improved. Marine biodiversity should be maintained.	Marine resources are a critical component of the ecosystem. Marine biodiversity is also a critical component of the ecosystem.
Soil Health	Soil health is declining due to deforestation and land use change. Soil erosion is also increasing.	Soil health should be protected and improved. Soil erosion should be controlled.	Soil health is a key component of the ecosystem. Soil erosion is a major threat to biodiversity and ecosystem services.
Air Quality	Air quality is declining due to industrial emissions and vehicle emissions. Air pollution is also increasing.	Air quality should be protected and improved. Air pollution should be controlled.	Air quality is a key component of the ecosystem. Air pollution is a major threat to biodiversity and ecosystem services.
Climate Change	Climate change is a major threat to the ecosystem. It is causing sea level rise, drought, and other impacts.	Climate change should be addressed. Sea level rise, drought, and other impacts should be controlled.	Climate change is a major threat to the ecosystem. It is causing sea level rise, drought, and other impacts.

### Ecosystem service components

Ecosystem service components: forest and dry (terrestrial) ecosystem functions			
1. Provisioning Services	2. Regulating Services	3. Cultural Services	4. Supporting Services
Food and Feed	Climate Regulation	Recreation and Tourism	Soil Formation and Retention
Fiber and Fuel	Water Regulation	Religion and Spirituality	Biological Regulation
Genetic Resources	Disaster Risk Reduction	Education and Research	Soil Fertility
Medicinal and Pharmaceutical Resources	Carbon Sequestration	Art and Culture	Soil Water Regulation
Recreation and Tourism	Wildlife Conservation	Historical and Archaeological Resources	Soil Nutrient Regulation
Religion and Spirituality	Disaster Risk Reduction	Education and Research	Soil Fertility
Art and Culture	Wildlife Conservation	Historical and Archaeological Resources	Soil Nutrient Regulation
Education and Research	Wildlife Conservation	Historical and Archaeological Resources	Soil Nutrient Regulation
Historical and Archaeological Resources	Wildlife Conservation	Historical and Archaeological Resources	Soil Nutrient Regulation

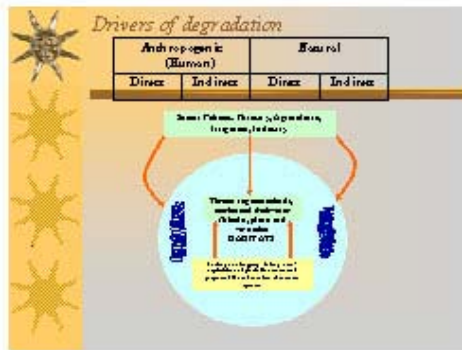
### Evidence of degradation

Indicator	Score	Grade
Deforestation	High	Very High
Water Resources	Medium	Medium
Wildlife	Low	Low
Marine Resources	Medium	Medium
Soil Health	High	Very High
Air Quality	Medium	Medium
Climate Change	High	Very High



- ### Degradation of mountain landscapes
- The Himalayan mountain landscape has been severely degraded, largely as a result of unsustainable land use practices.
  - According to the Forest Sector Master Plan (1992), forest, scrub and planted tree cover accounts for 2.2 million hectares, or 1.8% of the country.
  - If plantation and scrub forest are excluded, the coverage falls to 2.4 million hectares (2.7% coverage).
  - More than nine-tenths of the remaining natural forest has less than 10% canopy cover.
  - Good quality (50% canopy) forest constitutes less than 400,000 hectares.
  - Woody biomass is declining at the rate of 4%-6% per year and with consumption expected to grow in line with population growth, this biomass could be totally exhausted within the next fifty years (BAP, 1999).

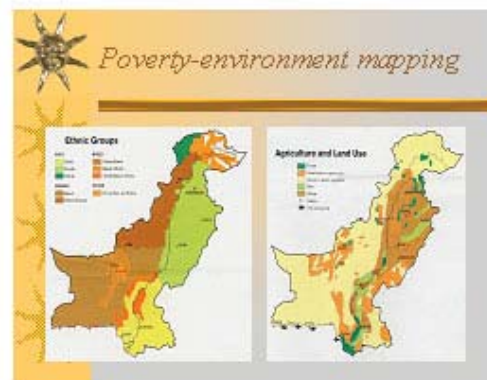
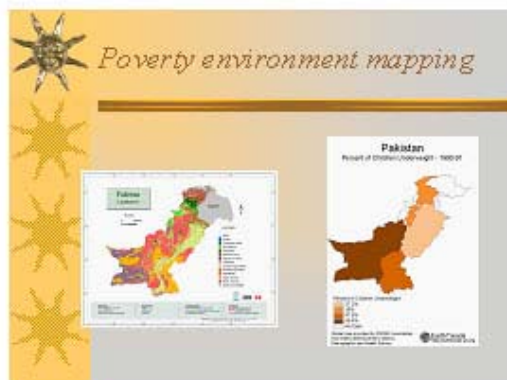
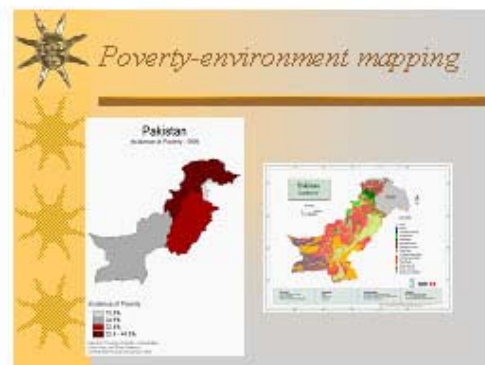




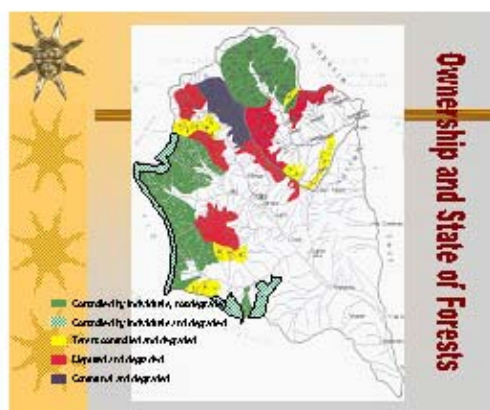
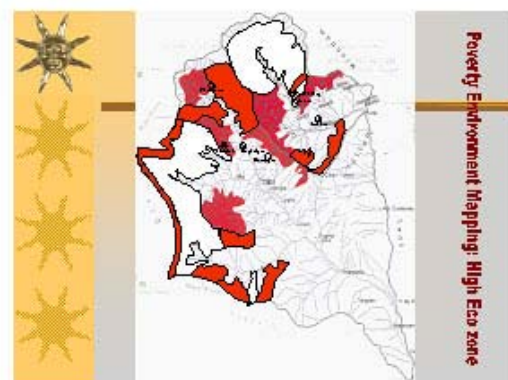
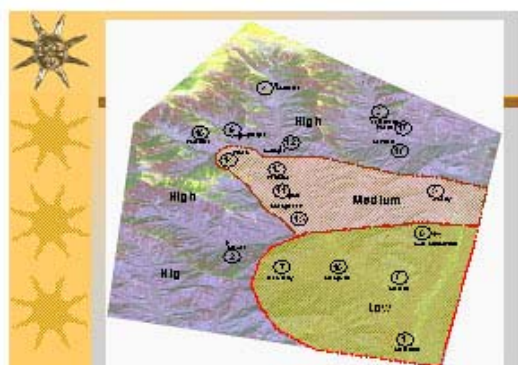
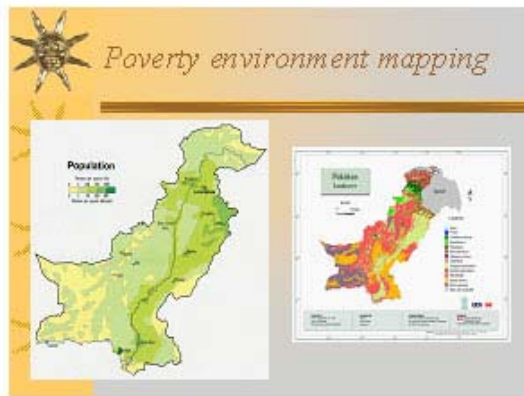
### Drivers of degradation

	Anthropogenic	Natural
<b>Direct</b>	Poverty	
<b>Indirect</b>	Economic	Climate change
	Institutional	

- ### Poverty, livelihoods and degradation
- \* Demonstrated reliance on ecosystem services
  - \* Contribute to degradation – poverty environment nexus









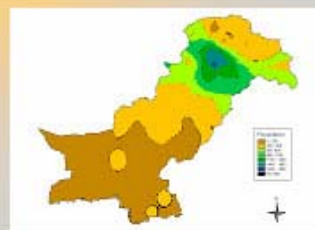


### *Institutional drivers of degradation*

- \*Protective, commercial and development orientation of forestry acts.
  - 1927 Forest Act, NWFP Forest Ordinance, 2002
  - Alienation of community resource rights
- \*Collapse of governance
- \*Absence of integrated management (horizontal linkages)



### *Climate Change*



### *Policy, institutional, programmatic interventions*

- \*Forestry reform
- \*JFMC
- \*PPP strategy
- \*Protected areas management initiatives



*Thank you*



**Annex-2**

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