SOUTH ASIAN ASSOCIATION FOR REGIONAL COOPERATION

Proceedings of SAARC Expert Group Meeting on INTEGRATING PAYMENT FOR ENVIRONMENTAL SERVICES (PES) IN MOUNTAIN ECOSYSTEM MANAGEMENT IN THE SAARC REGION

6 – 7 August, 2014
Paro, Bhutan

Organised by

SAARC Forestry Centre, Thimphu, Bhutan
&
Department of Forests and Park Services, Bhutan

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Royal Government of Bhutan

Mountain Ecology Division
SAARC Forestry Centre
Thimphu, Bhutan
2014

Foreword

Payment for Environmental Services is an incentive-based direct approach to conservation of natural resources whereby service providers receive payments that are conditional on acceptable conservation performance. A major success story in the SAARC Region is the first ever PES contract in Bhutan, signed in December 2010 between the Community Forest Management Group of Yakpugang and Mongar City Corporation for provision of drinking water to the Mongar town. The latter is paying the former in a successful contract for improved land management interventions.

Though there are several obstacle and barriers to the successful implementation of PES in developing countries, PES has the potential as an important and effective model in the conservation of the fragile mountain landscapes in the SAARC Region. Though poverty reduction is not the objective of PES, it can definitely address this important issue of the SAARC region.

In order to identify ways and means to integrate and enhance the use of PES in the mountain ecosystem management in the SAARC region, the SAARC Forestry Centre in collaboration with the Department of Forests and Park Services, Bhutan held a meeting of experts at Paro, Bhutan on 6 & 7 August, 2014. Experts from Bangladesh, Bhutan, India, Nepal and Sri Lanka presented papers on the theme and discussions were held. The outcome of the discussions has been presented as 'Conclusions and Recommendations of the Expert Group Meeting' in the Proceedings.

On behalf of the SAARC Forestry Centre, I would like to thank the Department of Forests and Park Services, Royal Government of Bhutan, Mr. K.B. Samal, Specialist, Watershed Management, DoPFS, RGoB for having contributed as the Resource Person for the meeting. I thank the Experts for having prepared and presented very important papers and for their active participation in the discussions.

The team at SAARC Forestry Centre including its previous Director, Dr. Sangay Wangchuk worked very hard in organizing the event and also in bringing out this proceedings and I appreciate their efforts.

We hope that the papers as well as the 'Conclusions and Recommendations' in the Proceedings would be useful to the Member States

Sangay
DIRECTOR

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I INAUGURAL SESSION

Report

The informal inaugural Session started at 09.00 AM on 06.08.2014 with the self introduction of participants.

The meeting was attended by experts from five SAARC countries viz., Bangladesh, Bhutan, India, Nepal, and Sri Lanka. The Director of SAARC Forestry Centre, Specialists from the Department of Forests and Park Services, Royal Government of Bhutan and the SAARC Forestry Centre also participated in the two day meeting.

In a brief welcome address, Mr. Udhayan, Specialist, Mountain Ecology Division, SAARC Forestry Centre and the Coordinator of the Meeting welcomed all the Experts nominated by the SAARC Member States, Mr. K.B. Samal, Resource Person for the meeting, officials from the SAARC Forestry Centre and Department of Forests and Park Services and briefly explained the objectives and schedule of the meeting. The objectives of the meeting are listed below:

a. To share experiences on implementation of 'Payment for Environmental Services' in SAARC landscapes;
b. To identify opportunities and challenges in implementation of PES for conservation as well as poverty reduction;
c. To provide relevant recommendations for enhancing the concept of PES in Mountain Ecosystem Management in SAARC;

Key note address by Dr. Sangay Wangchuk, Director, SAARC Forestry Centre, Thimphu, Bhutan

Dr. Sangay Wangchuk, Director, SAARC Forestry Centre, Bhutan, welcomed the participants and explained the objectives of the meeting. He explained that 'Payment for Environmental Services' (PES) has emerged in the recent past as a crucial tool in taking conservation forward in the scenario of climate change and other challenges faced by humanity. He quoted the findings of the Millennium Ecosystem Assessment, 2005 and mentioned that the SAARC countries are very closely linked to climate change, mountains and ecosystem services. The establishment of the 'Watershed Division' in Bhutan, which is spearheading the PES movement in Bhutan was a visionary step by the Royal Government of Bhutan. He was of the opinion that like the examples seen in Costa Rica and other countries, PES has a great potential in the SAARC region to make a huge impact in conservation as well as alleviation of poverty. He cited the Conservation Reserve Programme in the USA, which made a payment of 1.8 billion USD to the farmers as part of the PES programme.

Dr. Sangay Wangchuk mentioned that linking conservation, services, farmers, policy makers, people's representatives is crucial in achieving success in any programme and more so with a concept like PES. He then mentioned that it is expected during the meeting that the SAARC countries will place on the table the various steps taken by them towards implementing PES and the future programmes and expressed hope all countries can pick up useful lessons from it and implement the same in their respective countries. While mentioning about the potential of the PES concept, he also added a word of caution about venturing into new models by citing the

example of the negative impacts due to sudden economic upliftment of the upland people in Bhutan due to the harvest of the Chinese caterpillar, *Cordyceps sinensis.*

Dr. Sangay Wangchuk mentioned that the services of Mr. K.B. Samal, Specialist, Watershed Management Division, Department of Forests and Park Services, Royal Government of Bhutan has been availed for the meeting for providing his insight in PES as well as guiding the discussions right through the meeting. He then completed his key note address by mentioning that the detailed papers to be presented by the various experts in the meeting would be published as Proceedings of the meeting and distributed widely.

Vote of Thanks

Mr. Zaheer Iqbal, IFS, Specialist, SAARC Forestry Centre then concluded the inaugural session by thanking Dr. Sangay Wangchuk for delivering the key note address. He thanked the Department of Forests and Park Services, Royal Government of Bhutan for co-hosting the event. He also thanked Dr. K.B. Samal, Specialist, Watershed Management Division, Department of Forests and Park Services for having agreed to make a detailed presentation on PES and also guide the discussions during the meeting. He also thanked Dr. Sangay Wangchuk, Director, SAARC Forestry Centre, Mr. Pasang W. Norbu, Mr. K.J. Temphel, Mr. Udhayan, Specialists at the SAARC Forestry Centre, Mr. Karma and other officials of the SAARC Forestry Centre for all the guidance and support in holding the meeting. He also thanked Hotel Tashi Namgay Resort, Paro for making necessary arrangements of the meeting.

A Group Photo of all the participants was taken and the session concluded with High Tea.

The programme schedule followed for the SAARC Expert Group meeting and the details of the Experts, who participated in the meeting, is appended.

PHOTOS OF THE MEETING

Participants of the Expert group meeting held at Paro, Bhutan

Upper row (L to R): Mr. K.J. Temphel, Mr. Jamyang, Mr. Pasang Norbu, Mr. K.B. Samal, Mr. K.G. Sepala, Mr. T.C. Nautiyal, Mr. Zaheer Iqbal

Lower row (L to R): Mr. Udhayan, Mr. Shambhu Prasad Thapaliya, Mr. Farid Ahmed, Mr. Ram Hari Pantha, Dr. Sangay Wangchuk, Dr. Rajeev Lochan Semwal, Mr. Md. Abdul Latif Miah, Ms. M.A.Thulani R. Kularatne, Mr. H. W. Kumara Jayatilake

Mr. Udhayan, Coordinator of the meeting welcoming the participants

Dr. Sangay Wangchuk, Director, SAARC Forestry Centre delivering the Key note address

Mr. Zaheer Iqbal, Specialist, SAARC Forestry Centre delivering the vote of thanks

Technical session in progress

Group Discussion in progress

Dr. Sangay Wangchuk handing over mementoes to the participants

SAARC Expert Group Meeting

INTEGRATING PAYMENT FOR ENVIRONMENTAL SERVICES (PES) IN MOUNTAIN ECOSYSTEM MANAGEMENT IN THE SAARC REGION

6 – 7 August, 2014, Paro, Bhutan

Details of the Programme conducted

Day I - **6th August 2014 (Wednesday)**
(0900 – 1800 hrs)

Programme	Chair
Inaugural Session • Welcome address • Introductions • Briefing about objectives of the Meeting and the detailed programme by Mr. Udhayan A., SFC • Key note address by Dr. Sangay Wangchuk, Director, SFC • Vote of Thanks by Mr. Zaheer Iqbal, SFC • Photograph	
Presentation by Resource Person Payment for Environmental Services – A strategy to enhance Watershed Management in Bhutan - Mr. K.B. Samal, Specialist, DoFPS, Bhutan	Mr. Zaheer Iqbal, Specialist, SFC
Country Presentation - Bangladesh Payment for Environmental Services – Bangladesh Perspective - Mr. Md. Abdul Latif Miah & Mr. Farid Ahmed	Mr. Ram Hari Pantha, Nepal
Country Presentation – Bhutan PES Initiative in Bhutan: A case of PES Scheme established between Yakpugang Community Forest Management Group and Mongar Town on drinking water - Mr. Jamyang Phuntshok	Mr.T.C. Nautiyal, India
Country Presentation– India Integrating Payment for Ecosystem Services (PES) to Strengthen Environmental Governance in the Indian Himalayan Region – Dr. R. L. Semwal & Mr. T.C. Nautiyal	Mr. H.W.K. Jayatilake, Sri Lanka
Local field visit	

Day II – 7th August 2014 (Thursday)
(0900 – 1630 hrs)

Programme	Chair
Country Presentation– Nepal Nepalese Experience on Payment for Ecosystem Services (PES) – Mr. Ram Hari Pantha & Mr. S.P. Thapaliya	Mr. Jamyang Phuntshok, Bhutan
Country Presentation – Sri Lanka Integrating 'Payment for Environmental Services' (PES) in Mountain Forest Ecosystem Management in Sri Lanka - Ms. M.A.T.R. Kularatne & Mr K.G. Sepala	Mr. Md. Abdul Latif Mia, Bangladesh
Summing up of all country presentations - Mr. K.J. Temphel, Specialist, SFC	
• Filling up of questionnaire individually • Flagging of issues for Group Work • Breaking into Groups	Coordinated by Mr. K.B. Samal, Specialist, DoFPS, Bhutan and Mr. Udhayan, Specialist, SFC
Group work - Discussion on issues to come up with recommendations	Mr. K.B. Samal, Specialist, DoFPS
Presentation by Groups and discussion	Mr. Pasang W. Norbu, Specialist, SFC & Mr. K.B. Samal, Specialist, DoFPS, Bhutan
Finalisation of Recommendations	Dr. Sangay Wangchuk, Director, SFC
Closing Session	

SAARC Expert Group Meeting

INTEGRATING PAYMENT FOR ENVIRONMENTAL SERVICES (PES) IN MOUNTAIN ECOSYSTEM MANAGEMENT IN THE SAARC REGION

6 – 7 August, 2014, Paro, Bhutan

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II RECOMMENDATIONS OF THE EXPERT GROUP MEETING

SAARC Expert Group meeting on 'Integrating Payment for Environmental Services (PES) in Mountain Ecosystem Management in the SAARC Region'

In order to facilitate the final group discussion session held on the second day (7th August, 2014) of the Expert Group Meeting, a questionnaire was circulated amongst all the Experts initially to elicit their written responses. A copy of the questionnaire is at Annexure 1. Subsequently, the experts were divided into three groups and each group was given a topic to discuss. The three topics were:

1. Identify the challenges/limitations at present that restrict the use of PES in conservation of forests and wild ecosystems (even agro-forestry and other traditional practices). Elaborate and suggest ways to overcome it
2. Identify opportunities and potential PES models that could be adopted in the cause of conservation of forests and wild ecosystems in the SAARC Region (even agro-forestry and other traditional practices) in the SAARC region. Elaborate on the mechanism.
3. Identify measures that could be taken by the Governments (PES policy related instruments like policies, laws, validity of contracts, processes like verification, capacity building of communities) to enhance the use of PES in conservation. Elaborate on the measures

The groups then discussed on the topics and then presented their conclusions and recommendations.

I Key challenges and limitations identified that restrict the use of PES at present in conservation of forests and wild ecosystems in the SAARC Region

1. Lack of PES education at various levels of stakeholders (buyers, sellers, intermediaries-experts)
2. Lack of knowledge of the valuation of the Environmental Services
3. Inadequate capacity to participate in the PES
4. Difficulty in building consensus in a multi-sectoral approach, required for PES
5. Involves women, poor, marginalized and indigenous people's right issues
6. The land tenure/ownership issues
7. Lack of well defined PES schemes in the region
8. PES works at different scales - local/regional/national/trans-boundary
9. The issue of Time lag- the implemented activities of the Service provider take time to bear fruit
10. No formal Networking and information sharing mechanism.
11. No Knowledge providers-science
12. Translation of policy into action

II Recommendations to overcome the key challenges and limitations listed above

1. Recommendations for improving PES knowledge (points 1 & 2 in I above)

Stakeholder	Capacity Building Needs
Environmental services providers	1. Management of appropriate land use practices. 2. Alternate livelihood use to reduce dependency on natural resources. 3. Negotiation and organization skills.
Environmental services buyers/users	Knowledge related with 1. Capacity to recognize threats on environmental services. 2. Capacity for monitoring environmental services. 3. Negotiation skills.
Intermediaries	Skills related with 1. Valuation of environmental services. 2. Coordination and mediation skills. 3. Skills for influencing policy development and changes. 4. Social mobilization skills. 5. Skills for promoting gender and social equity.

Other Recommendations

2. Study the capacity of the service buyers and explore the options. For e.g., if service buyers cannot participate due to lack of financial capacity, can they pay for benefits in kind? If not, external support from government agencies or donors etc… should fund the establishment of PES
3. Conduct awareness programs and establish coordination mechanism.
4. Device a mechanism and guideline to accommodate participation by different groups.
5. Review and revise acts and polices to address the land tenure issues.
6. Focus on basic concepts and principles of PES scheme

III. Opportunities and Potential PES Models identified that could be adopted in the cause of conservation of forests and wild ecosystems Ecosystem Services

1. Water/ watershed management
2. Carbon including soil fertility
3. Biodiversity including agro-biodiversity
4. Cultural / Recreation

Scale

1. Local Level - Water and soil fertility, NTFPs, Agro Biodiversity, Tourism, Soil conservation
2. National Level - Water /Watershed management, Biodiversity, Carbon, Soil fertility, tourism
3. Regional Level - Water/ Water shed management, Soil fertility, tourism
4. Global Level - Carbon, Biodiversity, tourism

Valuation Instruments

1. Science & Technology (Finding Substitutes) - Biodiversity including NTFPs, carbon,
2. Education and Awareness
3. Law & Policy - Water, Biodiversity including Agro-biodiversity, Soil Conservation, tourism
4. Socio Cultural - Biodiversity including Agro-biodiversity, Water

IV Probable Mechanism of working of suggested PES models

a. Watershed protection and soil fertility maintenance:

Downstream water users paying upstream farmers for adopting land uses that minimize deforestation and flooding and reducing use of chemical pollutants
Hydroelectric company pays upstream communities to protect vegetation on slopes and minimize silt load in streams
Bhutan, Indian and Nepal cases – Local levels

b. Biodiversity Protection:
Conservation donors/Governments/Education and Scientific Institutions paying local people or institutions (Forest Protection Committees, Village Panchayats, Sacred Grove etc) for biodiversity protection and regeneration, Example- Costa Rica

c. Carbon Sequestration and Storage: Corporate Sector paying communities for planting trees; Donors at national and international through CDM/VCM REDD already in Place

d. Ecotourism /Landscape beauty

Tourist operators and hoteliers/ Education institutions paying local communities/ EDCs to maintain wilderness

Forest Department promotes community based ecotourism around PAs

V Measures that could be taken up by the Governments to enhance the use of PES in conservation

Measures	Elaboration on measures
Instruments (Policy, laws, validity of contracts etc.)	1. Building awareness about PES among all the stakeholders including the policy makers. 2. Multi-sectoral approach to be adopted while framing policies and guidelines for PES. 3. National PES guidelines to be formulated as per the policy. 4. Institutionalization of PES in annual plan/budget. 5. Including PES in Bilateral and Multilateral negotiations among countries.
Processes (eg. Monitoring, verification)	1. Identification of PES experts/negotiators for facilitation between buyers and sellers of environmental services. 2. The identified PES experts shall also act as the third party verification of the PES being provided.
Capacity building of communities	1. Utilization of community/local level institutions for generating stakeholder awareness.

III SESSION

Papers presented during the meeting

PAYMENT FOR ENVIRONMENTAL SERVICES: BANGLADESH PERSPECTIVE

Md Abdul Latif Mia[1] & Farid Ahmed[2]

[1]Assistant Chief Conservator of Forests, Bangladesh Forest Department, Ministry of Environment & Forests, Agargaon, Dhaka 1207
[2]Deputy Director, Department of Environment, Ministry of Environment & Forests, Agargaon, Dhaka 1207

Summary

Payment for Environmental Services (PES) is a growing concept around the globe for conservation of biodiversity and ecosystems. In order to conceptualize the linkage between ecosystem services and its payment, emphasis has been placed on identifying ecosystem services. These services primarily include provisioning and regulating services. Additionally, it has also been important to identify the drivers of change that alter services. Drivers are two categories: direct and natural, and indirect and social. This includes security, basic material for a good life, health, good social relations, and freedom of choice and action to influence decisions about services and well-being. However, PES is not widely practiced even in the developed countries. In a country like Bangladesh, PES so far is limited and embedded in ecotourism where people pay as entry fee to conserve and manage for overall improvement of biophysical condition in and around the protected areas (PAs). In recent past, government shares the revenue collected from the entry fee with the co-management organizations. Co-management organizations use the funds to protect the ecosystems among other management functions that restore and conserve the ecosystems. Bangladesh is a growing economy and achieving over 6% growth over last couple of years. It is a viable country for nature tourism to flourish and encouraging population for recreation and thereby set the basis for tourism. In that case, nature based tourism around the protected areas (national parks and wildlife sanctuary) has tremendous scope to grow in Bangladesh. But forest areas in Bangladesh are threatened by population pressure, illicit felling, conversion of land into agriculture and other settlement, poverty, political pressure and climate change. In Bangladesh there is limited scope to invest for environment conservation as conservation is seen as costs rather than investments. In Bangladesh, only entry fee from the visitors are collected from the few protected areas but still have potential to introduce PES for other environmental services through service buyers, and potential service providers especially the local community people. PES in connection to tourism will improve the governance of natural resources and livelihood diversification if attention is paid to the social and economic wellbeing of community folk through revenue sharing from the planned increased collections from entry fees to protected areas. One of the most pressing issues for conservation involves offsetting the 'opportunity' costs to rural communities of protecting natural habitats rather than converting them to agriculture or other uses providing immediate income. Economic returns from the protection of protected areas are not high enough to prevent their conversion to other uses. Without sufficient economic, social, and policy incentives, the most important protected areas in Bangladesh are likely to become degraded, along with the important ecosystem functions they provide. Very limited funding sources are available for conservation of protected areas, and restoration programs have not received enough funding to meet and maintain required environmental services of protected areas. In this situation, PES based mechanism may be an important tool in protection and restoration of protected areas ecosystem services of Bangladesh.

Background/Introduction

Bangladesh is one of the most densely populated countries in the world. Its land area of 143,998 square kilometers has an estimated population of 152.5 million people, creating an average density of 1,142 people per square kilometer. Approximately, over 71 percent of the population live in rural areas (World Bank, 2012) and roughly half of these rural households do not have tenure rights to land and are directly dependent on natural resources for their survival. Despite Bangladesh's recent economic growth and aspiring middle income status, over one fourth (BBS, 2010) of her population are still living under poverty line.

Payments for environment services (PES) mechanisms compensate individuals or communities for undertaking actions that increase the provision of ecosystem services such as ecotourism, watershed management, biodiversity conservation or carbon sequestration. PES programs induce behavioral change by providing an economic incentive and as such are considered part of the broader class of incentive- or market-based mechanisms for environmental protection. Payment for ecosystem services (PES) is a tool to enable a forest owner or owners to capture the financial benefits from the positive externalities derived from forest ecosystem services and encourage them to continue to provide these services to another party or society at large (United Nations, 2014).

With PES, the fact that the money goes directly to the service provider helps ensure that the service will continue. This payment can be used to strengthen particular ecosystem against pressures including climate change. As a voluntary agreement, rather than a tax or fine, it is expected willingness to comply from the paying party (though at present, no evidence is available to substantiate this) leading to lower transaction costs. Public PES requires an appropriate legislative framework that regulates PES schemes to stimulate the development of trustworthy markets and to ensure good governance (Greiber, 2009).

In Vietnam, a pilot approach supported natural resource management and conservation in such a way that it provided actual economic opportunities to rural communities by sustainable financing for poverty reduction. There 'Payment for Forest Environmental Services' (PFES) has provided local stakeholders with a significant role in managing those forest resources that contribute to their livelihoods, helping to ensure continuing local support for conservation (Winrock International, 2011).

The total forest land in Bangladesh is 2.52 million hectare which is 17.4% of the country's total area (FAO, 2010). Bangladesh Forest Department manages 1.52 million hectares, District administration administers 0.73 million Unclassified State Forests (USF), and homestead covers 0.27 million hectares. But the percentage of forest cover corresponding to total land area is 10.2%. Protected Area covers 10.72% of the total forest area. To protect unique and outstanding biological and physical attributes, the Government of Bangladesh has declared some forests areas as protected area under the Bangladesh Wildlife (Preservation) Amendment Act of 1974. The key objectives of the protected areas are to protect unique ecosystems, species of special interest under threat, landscapes or geophysical features of aesthetic or scientific values, hydrological functions, nature recreation, tourism, education, as well as cultural values of the areas. Presently in Bangladesh there are 2 types of forest protected areas, namely National Park and Wildlife Sanctuary. National Park is defined as a comparatively large area of natural beauty

to which the members of the public have access for recreation, education and research, and in which the wildlife is protected. Whereas, Wildlife Sanctuary is defined as an area maintained as an undisturbed breeding ground for wild fauna and where the habitat is protected for the continued well-being of the resident or migratory fauna. There are 17 national parks and 20 wildlife sanctuaries in Bangladesh (Table-1):

Table 1: Protected Areas in Bangladesh:

Sl. No.	National Parks	Area (ha.)	Sl. No.	Wildlife Sanctuaries	Area (ha.)
1	Bhawal National Park	5022.00	18	Rema-Kalenga Wildlife Sanctuary	1795.54
2	Madhupur National Park	8436.00	19	Char Kukri-Mukri Wildlife Sanctuary	40.00
3	Ramsagar National Park	27.75	20	Sundarban (East) Wildlife Sanctuary	31226.94
4	Himchari National Park	1729.00	21	Sundarban (West) Wildlife Sanctuary	71502.10
5	Lawachara National Park	1250.00	22	Sundarban (South) Wildlife Sanctuary	36970.45
6	Kaptai National Park	5464.00	23	Pablakhali Wildlife Sanctuary	42087.00
7	NijhumDweep National Park	16352.23	24	Chunati Wildlife Sanctuary	7763.97
8	Medhakachhapia National Park	395.92	25	Fashiakhali Wildlife Sanctuary	1302.43
9	Satchari National Park	242.91	26	Dudpukuria-Dhopachari Wildlife Sanctuary	4716.57
10	Khadimnagar National Park	678.80	27	Hajarikhil Wildlife Sanctuary	1177.53
11	Baroiyadhala National Park	2933.61	28	Sangu Wildlife Sanctuary	2331.98
12	Kuakata National Park	1613.00	29	Teknaf Wildlife Sanctuary	11615.00
13	Nababgonj National Park	517.61	30	Tengragiri Wildlife Sanctuary	4048.58
14	Singra National Park	305.69	31	Dudhmukhi Wildlife Sanctuary	170.00
15	Kadigarh National Park	344.13	32	Chadpai Wildlife Sanctuary	560.00
16	Altadighi National Park	264.12	33	Dhangmari Wildlife Sanctuary	340.00

17	Birgonj National Park	168.56	34	Sonarchar Wildlife Sanctuary	2026.48
			35	Nazirganj Wildlife (Dolphin) Sanctuary	146.00
			36	Shilanda-Nagdemra Wildlife (Dolphin) Sanctuary	24.17
			37	Nagarbari-Mohanganj Dolphin Sanctuary	408.11

PES like ecotourism is an economically efficient tool for conservation. The World Travel and Tourism Council (WTTC) reported in 2013 that the travel and tourism industry in Bangladesh directly generated 1,281,500 jobs in 2012 or 1.8 percent of the country's total employment. Direct and indirect employment in the industry totaled 2,714,500 jobs, or 3.7 percent of the country's total employment. The WTTC predicted that by 2023, travel and tourism will directly generate 1,785,000 jobs and support an overall total of 3,891,000 jobs, or 4.2 percent of the country's total employment. This would represent an annual growth rate in direct jobs of 2.9 percent. Domestic spending generated 97.7 percent of direct travel and tourism gross domestic product (GDP) in 2012. Bangladesh's world ranking in 2012 for travel and tourism's direct contribution to GDP, as a percentage of GDP, was 142 out of 176.

Social forestry practices were introduced in Bangladesh back in 1981, now a popular and effective production forestry system, where local landless people are getting involved with more enthusiasm and interest. The FD raising plantation in marginal strips or degraded and encroached forest land, and local people involved as beneficiaries in raising and protecting the plantations getting their due share at the end of short rotation of 10 years only. The benefits they received from share could alleviate their poverty. To make the social forestry practices more sustainable and also to reduce dependency on government fund, Tree Farming Fund (TFF) has been introduced. This TFF used in next rotation plantation raising and maintenance are also managed by social forestry committee, where participants are members too. As a result, next rotation plantation raising and maintenance are now more secured, which will help to establish a successful plantation and will also offset the compensation of environmental loss can be termed as PES feasible avenue.

Challenges and opportunities:

Despite huge potentiality of PES through ecotourism, the net ecosystem service impacts of the tourism product must be compared against the business as usual scenario. Conceptualizing, benchmarking, and monitoring these impacts is critical. Economic development for tourism often involves use of imported labor, materials, souvenirs, fuel, food and equipment. Tourism investors often export profits outside the protected area. Each of these factors contributes to the leakage of the PES out of the communities, the PES system was devised to support. Risk exposure can be minimized with a focused and strategic park comprehensive plan, commitment to incorporating poorer households in economic development, minimizing tourism’s impact on landscape, biodiversity, and culture, and by ensuring the tourism product supports and is

supported by a diversified provincial economy, a commitment to waste reduction and locally sourced, sustainable products.

In Bangladesh, there is no legal and institutional framework for PES. An appropriate legislative framework is needed to regulate public PES schemes that stimulate the development of trustworthy markets and to ensure good governance. PES legislation at all levels, from local to national can play an important role in the further promotion and implementation of watershed management. PES development should gain from practical experience, with local projects in framing regional and national legislation which, in turn, provides greater legal certainty and a framework that enables rather than restricts regional and local initiatives.

Co-management[1] system in protected areas can play a significant role in implementing PES in Bangladesh. Presently the system is getting momentum in protected areas and co-management organizations (CMOs) are taking various activities to manage protected area, specially improve the biophysical condition in and around the protected area. Co-management organizations are responsible for patrolling of forests in association with forest department personnel, developing co-management plan and implementing the plans in consultation with forest department, promoting eco-tourism in protected area, physical interventions like tree plantation in core and buffer area, hydrological interventions, providing alternative livelihoods to the surrounding community people to reduce pressures on forest and forest land.

Despite the challenges to introduce and implement PES in ecotourism, Bangladesh is becoming increasingly popular amongst tourists worldwide. While tourism in Bangladesh is only just starting to serve as a foreign currency earner, the country was listed by Lonely Planet in 2011 as the "best value destination". The National Tourism Policy in 1992 recognized the importance and potential contribution of tourism to the country's economy. The Industrial Policy of 1999 further recognized the tourism industry as an important economic sector and incentives such as tax exemption were given to potential investors seeking to invest in the tourism sector.

Tourism in Bangladesh is managed by Bangladesh Parjatan Corporation (BPC) under the Ministry of Civil Aviation and Tourism (MCAT). Tourism-related marketing and promotional activities are the direct responsibility of the Bangladesh Tourism Board (BTB), which is currently launching a new campaign to promote "Destination Bangladesh" with a strong focus on nature tourism, diverting from a mass tourism target market approach. The BTB strongly supports Bangladesh's promotion of nature based tourism and also stated that further development in promoting nature tourism is also on their mid-term agenda. National Tourism Policy 1992 amended in 2009 had emphasized nature based tourism development and also identified the historical and cultural assets of Bangladesh as being a valuable asset to the tourism sector.

The World Travel & Tourism Council (WTTC) expects the contribution of travel and tourism to gross domestic product in Bangladesh to rise from 3.9% reported in 2010 to an estimated 4.1% by 2020. During the last few years, the country has received numerous international recognitions. Sundarbans and Cox's Bazaar were for example, enlisted as candidates in the Worldwide

[1] A joint forest management systems between government and community people

New7Wonders of Nature campaign in 2007, and in 2009, Sundarbans was an official finalist in the New7Wonders category.

Way forward

PES has huge potential in Bangladesh. The Chittagong Hill Tracts(CHT) has the greatest potential tourism development as the area boasts huge natural forest areas, eye-catching beautiful lakes surrounded by low hill/mountains, and a number of ethnic communities endowed with their own culture. CHT supplies 40% of commercial timber of Bangladesh and a huge population is involved in forestry activities (Gain, 2002). Characterized with fragility, sensitivity and complexity, the CHT ecosystems are highly susceptible to climate variables that could affect watershed, biodiversity and ecosystems.

The Khulna Region can be identified as PES feasible area. The world largest mangrove, Sundarbans is situated in that area and the area most poised for further development in accommodation, and River Tours which could be complimented by the overall upgrading of the waterfront of the village of Munshiganj. The focus of development for that area would primarily be Eco Lodges, Boat Tours and the upgrading of the Munshiganj commercial area leading to the docks.

With regard to the Sylhet Region, PES can be introduced both in the Khadimnagar National Park and RemaKalenga Wildlife Sanctuary. With regard to the Lawachara National Park and the Satchari National Park, the PES would be focusing on improving their operational capabilities and overall refurbishing of the park facilities.

PES connects a variety of constituencies and can support sustainable development between man and nature. PES consists of a variety of products and services and the development of a viable tourism industry will provide new economic opportunities for the communities in which they operate. For example food and crafts production can generate considerable employment and profits for local populations, when volume production and delivery at set quality standards can be met by the local producers.

By developing a Sustainable Nature Tourism Program in the rural communities, PES will provide not only new job opportunities, but the planning and development process would provide the local suppliers/manufacturers with information on environmental best practices to be applied to their businesses. The promotion of local sourcing will therefore require specialized training and technical support for new investments in areas such as environmental management. This will have a positive impact on the communities by bringing to them a greater awareness of environmental issues and their resilience to climate change.

Public sector can play a significant role in promoting PES though providing environmental protection, infrastructure, such as roads and airports, security and enforcement, monitoring and controlling impacts, allocating access to information, such as through interpretative programs, resolving conflicts and coordinated marketing among many providers. However, private sector can contribute to PES to provide accommodation and food, transportation, such as busses and airlines, information such as guides and brochures, promote sites to potential visitors, provide consumer products such as souvenirs, and marketing of specific sites.

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Central Region		Chittagong Region		Southwest Region	
#	NAME	#	NAME	#	NAME
1	Madhupur	13	Baraiyadhala	26	Sundarban WS and RF
		14	Hazarikhil	27	Sundarban ECA
Northeast Region		15	Kaptai	28	Tengragiri
#	NAME	16	Dudpukuria-Dhopacha	29	Kuakata
2	Tanguar Haor	17	Chunati	30	Sonar char
3	Sunamganj Haor Basin 1	18	Nijhum Dweep	31	Char Kukri-Mukri
4	Sunamganj Haor Basin 2	**Cox's Bazar Region**			
5	Khadimnagar	#	NAME		
6	Hakaluki Haor Catchment	19	Fasiakhali		
7	Hakaluki Haor	20	Medhakachapia		
8	Lawachara	21	Himchari		
9	Hail Haor - Lawachara Catchment	22	Sonadia ECA		
10	Hail haor	23	Inani (proposed)		
11	Rema-kalenga	24	Teknaf		
12	Satchari	25	Teknaf Peninsula		

PES INITIATIVE IN BHUTAN: A CASE OF PES SCHEME ESTABLISHED BETWEEN YAKPUGANG COMMUNITY FOREST MANAGEMENT GROUP AND MONGAR TOWN ON DRINKING WATER

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Summary

PES is a relatively new initiative in Bhutan and it is only currently operational on a limited scale. The initiative gained status after a feasibility study conducted by Watershed Management Division (WMD) with support from FAO in 2009. The study identified three sites for piloting PES on hydropower, tourism, and drinking water in Bhutan. While there are acts, policies, regulations and other documents enabling the establishment of PES schemes in Bhutan, the only PES scheme in the country is related to drinking water protection in Yakpugang, Mongar, which became operational in 2011. Other schemes have not made much headway because of limitations in data and design, and inadequate advocacy work required within the contexts of the proposed schemes.

The Yakpugang scheme focuses on protection and enhancement of the Yakpugang community forest, from where the drinking water for Mongar town is tapped. The scheme was integrated in the existing Yakpugang community forest management program, which was established in 2001 and signed between the Yakpugang CFMG and the Mongar Municipality which has the responsibility for supplying water to the town. Six activities were agreed by the parties as a conditionality of the scheme and for this payment of Nu.52,000 per year was fixed to be paid by the beneficiaries. A verification team comprising of relevant agencies was formed to ensure the agreement was correctly valued.

The initial contract term was completed successfully in December 2013 and the WMD (as a nodal agency for PES in Bhutan) is currently working on the renewal process. The renewed scheme is envisaged to be operational by January 2015.

Introduction

Payment for Environmental Services (PES) is a mechanism to provide incentives to upland farmers or communities for managing the environment to benefit downstream users (beneficiaries). Its working definition as per Richards & Jenkins (2007) is “a voluntary, conditional agreement between at least one “seller” and at least one “buyer” over a well-defined environmental service”. However the condition is that the seller agrees to sell the service and the buyer agrees to pay for the service. Generally, PES is perceived as a promising and efficient move towards the protection of environmental services by incorporating them into the market system. However, it usually only occurs when the service users are not getting the necessary environmental services or when there is evidence of environmental services being exhausted.

In Bhutan, PES is a relatively new concept and currently is only operational on a limited pilot scale. It is presently managed under the programs of the Watershed Management Division (WMD), under the Department of Forest & Park Services. The concept of PES first began with

the official endorsement of the Bhutan National Food Security Strategy Paper (BNFSSP) in May 2006 by the Royal Government of Bhutan (RGoB). The paper recognized Payment for Environmental Services (PES) as a potential instrument for improving household food security. However, the PES initiative only effectively started after a feasibility study conducted by the WMD with technical and funding support from Food and Agriculture Organization (FAO) of the United Nations in November 2009.

Enabling Environment and Relevance of PES in Bhutan

"PES-like" thinking is not new in Bhutan even though its actual implementation has been restricted to date due to lack of experience to achieve the desired results. There are many policies, acts, roadmaps, strategy papers, rules, and vision documents that enable the implementation and promotion of PES in Bhutan. For instance, The Water Act of Bhutan, 2011 has a section on PES that states "*The Commission shall promote payment for the environmental services provided by water resources, such that the cost of conserving water resources in the upper watershed areas are shared by downstream users*". Likewise the National Forest Policy of Bhutan, 2011 enables PES for watershed services. It has a very specific provision that states "*Pursue options for the payment for watershed services to cover the costs of maintaining and improving watershed conditions and watershed services*". Similarly, there are many other documents such as the National Environment Act, 2007, The Constitution of Bhutan 2008, Bhutan 2020, Bhutan Water Policy 2003, The National Environment Strategy of Bhutan 1998, Draft Forest and Nature Conservation Rules 2013, Economic Development Policy of the Kingdom of Bhutan 2010, Bhutan Sustainable Hydropower Development 2008, Bhutan Water Policy 2007, Bhutan Renewable Energy Policy 2011, Eleventh Five Year Plan, etc to name just a few documents that enable the adoption of PES mechanisms in Bhutan to maintain and achieve its target of 60 percent forest coverage for all times to come.

Furthermore, the mechanism has immense relevance to Bhutan's hydropower and tourism sectors, which are the country's top revenue generators, as well as for sustainable farming that supports the livelihood of about 70 percent of the population. These sectors, which are the main drivers of Bhutan's economy, are highly dependent on the condition of natural ecosystems and their services. Besides, PES can also provide services such as flood and soil erosion control, climate regulation and clean air and water which are important particularly for a country like Bhutan which is highly vulnerable to climate change and associated risks due to its rugged mountain terrain, and fragile geology.

Start of PES Schemes in Bhutan

The PES initiative in Bhutan effectively only started after the feasibility study conducted in 2009 by the WMD with technical and financial support from FAO. The feasibility study report, while recommending the establishment of PES in Bhutan in general terms, also recommended three PES pilot sites (Fig 1), one each on *hydropower*, *tourism* and *drinking water*.

Woochu sub catchment, under Paro Dzongkhag in western Bhutan was selected as a PES pilot site with an aim to bridge some of the existing scientific gaps related to hydrology and natural resource management and to inform future design of PES activities targeted at hydropower. Woochu is a sub-watershed of the Wang River Basin, which is currently the most important watershed in Bhutan for hydropower. This watershed is currently responsible for generation of 90 percent of the country's hydropower and is threatened by upstream environmental degradation, sedimentation and lean seasonal flows.

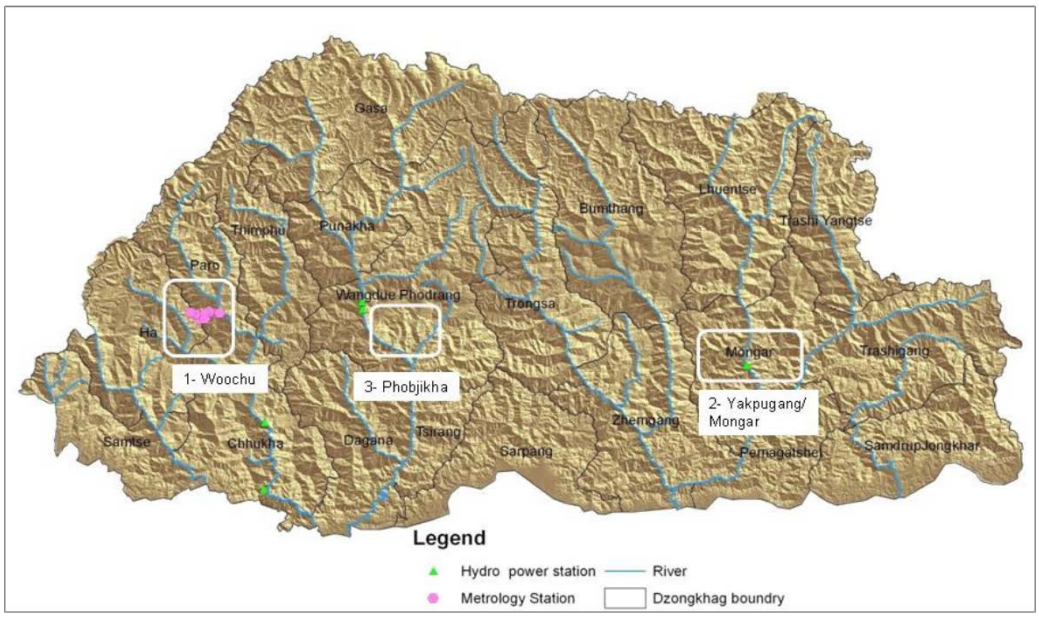

Figure 1: Location of identified PES sites

However, a PES scheme has not been able to be established so far at Woochu due to inadequate data to quantify the amount of sediment produced by the sub watershed and its impact on the hydropower facilities. Further, the fact that there is no visible environmental degradation in the sub-watershed and also that pressure from human activities is limited has diminished the case for the establishment of a PES scheme. Nonetheless, stream discharge data from the sub watershed is being continuously collected and recorded for future reference.

The Phobjikha-Gangtey valley was also identified as a potential site for PES, this time focusing on ecotourism services. The valley has been declared as a conservation site by the Royal Government because of its significance as the country's largest habitat for the globally threatened black-necked cranes and also as one of the most important natural wetlands in the country. The valley is also one of Bhutan's most scenic in terms of landscape and a popular tourist destination. However, given the centralized management of tourism activities and charges, there has been little capture of tourism revenue at the local level. As such, the idea of a PES scheme in Phobjikha was to design a mechanism to capture tourism revenue locally and make the funds available for conservation management and rural development of its villages.

However, this PES scheme has not been able to be established either even though several modalities have been tried. The first modality was for payment of entrance fees to visit the valley. But this modality was abandoned for fear of setting a precedent as there are no other systems for charging entrance fees in Bhutan, even in protected areas, let alone conservation areas which currently have no legal recognition. Besides, the ecotourism guidelines developed by the Nature Recreation and Ecotourism Division(NRED) do not contemplate such an option and the tourism sector sees it as a creating further financial burden and an extra cost for tourists who are already paying a high tariff for visiting Bhutan.

The other method tried was to place a donation box supported by information materials with an

activity outline to undertake ecosystem management via donations. However this method was seen as inappropriate by DoFPS and was rejected as it is purely based on voluntarism and is unlikely to raise sufficient funds. The ecotourism PES scheme requires detailed work in terms of the design of the scheme, development of negotiation materials, awareness raising especially among tour operators and tourism authorities and consensus-building at the upstream decision-making level as well as the operational level. Currently the WMD through its project on "integrating PES & REDD+ in Bhutan" is trying to raise awareness and build partnerships with relevant stakeholders to establish the PES scheme in the valley.

The third pilot site identified for the Yakpugang Community Forest in Mongar was focused on protection and enhancement of the Yakpugang Community Forest itself. The community forest is provides the main source of water for the Mongar township and experiences a perennial problem of drinking water shortage. The site was selected with a goal to demonstrate that rural communities can be better stewards of natural resources than through a more centralized approach, and if given the appropriate incentives can do so at lower social and financial costs. Of the three recommended pilot sites, this is the only PES scheme which has become operational to date. The PES agreement for this scheme was signed between Yakpugang Community Forest Management Group (CFMG) as the environmental service provider and Mongar Municipality as the environmental service buyer. The process was mediated by the WMD with technical and financial support from SNV-Bhutan.

Yakpugang PES on drinking water

The Yagpugang sub-watershed (Fig 2) is located within the larger Kurichu watershed and is the main drinking water source for the Mongar Township, schools and the hospital.

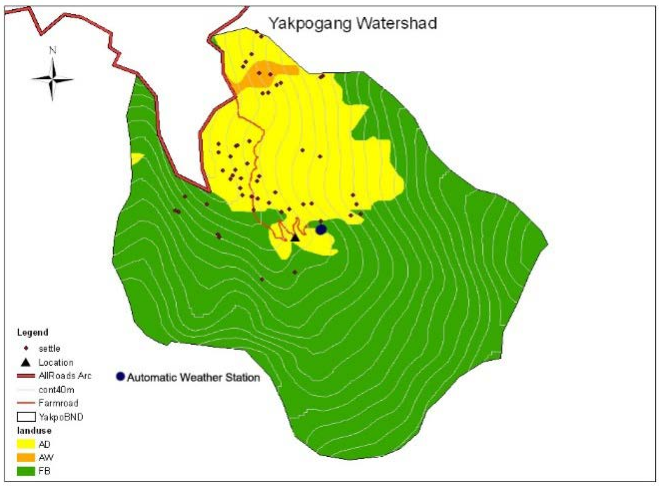

Figure 2: Map of Yakpugang watershed

The sub-watershed covers an area of about 260 hectares and is managed by the Yakpugang Community Forest Management Group (CFMG) comprising of 113 members from two villages (Yakpugang & Kilikhar). The community forest was established in 2001 and handed over to the community with the intention of locally-managed sustainable forestry. The community forest area spans 2800 meters from east to west and 1400 meters from north to south. The slope of the land faces north with an altitude ranging from1800 meters to 3200 meters (CFMG Plan). The

sub-watershed is also important from a hydropower generation point of view as there is a 60 MW hydropower plant located on the Kurichu downstream of the watershed.

Methodology

1. Investigation of the Mongar Drinking Water Problem

As mentioned above, the Yakpugang watershed area was identified as a pilot site for PES on drinking water protection. This idea was further substantiated when the Mongar Dzongkhag administration approached the Ministry of Agriculture and Forests regarding drinking water shortages and to study the potential to start a PES initiative on drinking water. Immediately, a team from the Watershed Management Division under the Department of Forest & Park Services was dispatched to study the problem in Mongar Dzongkhag from12-19 July 2010.

The team met with all the relevant stakeholders including the Municipal Office, Dzongkhag Administration, RNRRDC Wengkhar, the Dzongkhag Forest Sector, upstream communities and drinking water users. Separate workshops were held with the upstream community of Yakpugang and water users within the Mongar town regarding establishment of a PES scheme for protection of drinking water sources. At the same time, the team also assessed the existing drinking water sources and their condition, the water distribution system, and most importantly discussed the possibility of establishing a PES scheme.

2. Findings of the Investigation

The team found the watershed in good condition and sufficient amount of water is available at the source, but the water distribution system was poorly maintained and there were not enough storage tanks. Most importantly, the team noticed that water tapping at the source was poorly done as there was still plenty of water flowing below the tapping point despite water shortages being reported at the users end.

One of the most important findings of the team was that the water source was critical due to farming activities, grazing and other activities taking place in the sub-watershed. Similarly, as indicated in the feasibility report, the municipality office which is responsible for supplying drinking water to Mongar town was also concerned with the effects of human interventions on its water supply. Further, the Yakpugang and Kilikhar communities claimed that their stewardship role for protecting the forest has improved the quality of services from the sub-watershed and reduced treatment costs for the town water supply system. The dzongkhag also raised concerns regarding the sustainability of the water source against the backdrop of the growing Mongar town population. The Mongar town water users also acknowledged their current dependence on water supply from the Yakpugang community forest and were willing to enter into negotiations with the CFMG for payment of this service. As a result, the team reported back inter alia with the potential of setting up a PES scheme on drinking water between the CFMG of Yakpugang and the end users.

3. Design of the PES Model

Following a report confirming the potential for a new PES in Mongar, the WMD in collaboration with its partners worked on the design of the scheme. The team came up with the model shown in Figure 3.

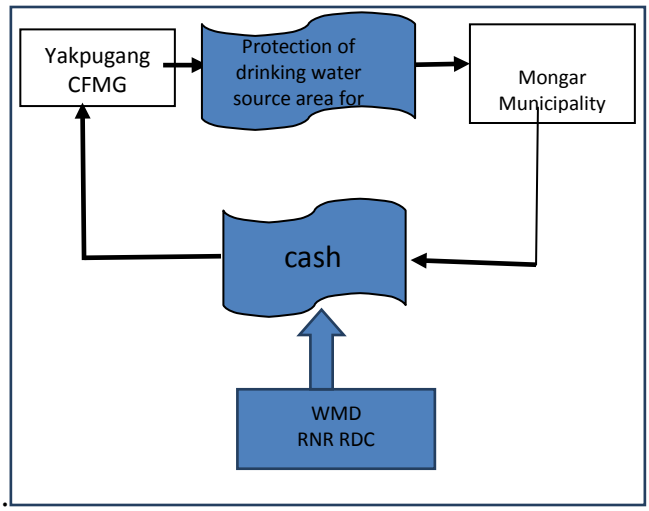

Figure 3: Proposed Yakpugang PES model

As the main entities for drinking water supply in the town, the Mongar municipality and the local drinking water protection service providers are directly linked in the proposed PES scheme. Suggested interventions are targeted at the whole watershed area and aimed at avoiding risks from land-use practices and improving watershed services.

The PES mechanism was foreseen as one financial option to improve water stewardship for sustainable drinking water supply for the town people who have shown a willingness to pay for this service. The town is located only a short distance from the service providers in the Yakpugang and Kilikhar villages and so the different groups could easily interact and assess progress. As part of this study, a day's consultative workshop was held with the CFMG of Yakpugang, who will provide the service. The following activities (for protection of drinking water sources) were identified by the CFMG for further negotiation with the drinking water users:

1. A buffer area of 100m will be maintained by the CFMG around water sources & along the banks of streams as riparian protection.
2. Cattle will be grazed only during daytime & no cowsheds will be constructed within the sub-watershed.
3. On average, the CFMG will keep only 5cattle per household.
4. Plantations will be carried out by the CFMG inland slide areas within the sub-watershed.
5. The CFMG will clear fallen trees from streams & avoid clear felling.
6. Owners of private fallow land will establish private forests within the sub-watershed.

Similarly, a day's consultative workshop was also held with the drinking water users (mainly the business community). While they agreed to the PES concept, they pointed out that there are other water users like government agencies, the monk body and other villages besides them. They suggested that other water users could also contribute to the PES scheme. The drinking water users wanted the Yakpugang community to implement the following activities towards protection of the water sources and to improve the quality of the drinking water:

1. Livestock should be reared in line with the policy guidelines of the Department of Livestock i.e., reducing scrub, limiting the cattle population and keeping fewer productive animals.
2. Prevent livestock from other areas (Drepong) entering into the sub-watershed.
3. Plantation of trees in harvested areas & other barren areas.
4. Protection of all water sources in the wider Mongar watershed.
5. Avoid felling of trees in water source areas.
6. Protection of water sources through fencing.
7. Plantation of fodder trees & bamboos to reduce grazing pressure.

From the lists of activities proposed by both the providers & buyers of the drinking water services, there were many activities in common. Those activities proposed by the parties have formed the basis for further development of the PES scheme.

4. Establishment of the PES Scheme

Subsequently, several visits to the area were made by WMD staff technically supported by SNV to conduct workshops with both the buyers and sellers of the proposed environmental service (ES). Workshops were conducted separately as well as together. The discussions came to a consensus on the following six activities to be implemented by the ES providers, i.e., Yakpugang CFMG:

1. A buffer area of 160 m shall be maintained above the water sources & 100 m along banks of major streams for riparian protection
2. Cattle shall be grazed only during daytime in the CFMG area & no cowsheds shall be constructed within the CFMG area
3. On average the Yakpugang community shall keep no more than 5 cattle per household
4. Plantations shall be carried out by the Yakpugang CFMG in landslide areas and other barren grounds within the CFMG area
5. The CFMG shall clear fallen trees from streams within the CFMG area from the date of contract signing (shall not apply to trees that have fallen before the date of contract)
6. The CFMG shall guard the CFMG area from illegal extractions of forest resources & against grazing by cattle other than those of the Yakpugang community

Upon agreeing activities as conditionality for the ES providers, similar workshops were held again with the relevant parties to put a price on the aforementioned six activities. Pricing was based on mutual agreement rather than any scientific basis related to the activities themselves. Following discussions, both parties came to a consensus with the following price for each of the six activities to be paid by the ES users following verification by the verification team:

1. A buffer area of 160 m shall be maintained above water sources & 100 m along banks of major streams for riparian protection: **Nu.20,000.00 per annum**

2. Cattle shall be grazed only during daytime in the CFMG area & no cowsheds shall be constructed within the CFMG area: **Nu.10,000.00 per annum**
3. On average the Yakpugang community shall keep no more than 5 cattle per household: **Nu.10,000.00 per annum**
4. Plantations shall be carried out by the Yakpugang CFMG in the landslide areas and other barren grounds within the CFMG area: **Payment shall be made on actual costs of seedlings; transport; and labour costs of planting the seedlings**
5. The CFMG shall clear fallen trees from the streams within the CFMG area from the date of contract signing (shall not apply to trees that have fallen before the date of contract): **Nu.5000.00 per annum**
6. The CFMG shall guard the CFMG area from illegal extractions of forest resources & against grazing by cattle other than those of the Yakpugang community: **Nu.12,000.00 per annum**

Based on the above agreement, the contract was signed for three years on **1st December 2010** between the **Yakpugang Community Forest Management Group** as the ES Provider and the **Municipal Corporation of Mongar Town** as the ES Buyer of the PES scheme.

Verification

A Verification Team was formed consisting of representatives from the DFO Mongar; RNR RDC Wengkhar; Dzongkhag Forestry Officer Mongar; Buyers & Providers of the ES and the WMD as the coordinator. The team conducted the first verification before the contract was signed. The findings of the first verification were setup as a baseline of the watershed condition for reference in subsequent verifications. These subsequent verifications were conducted quarterly with reports submitted to the Buyers & Providers of the ES to advise on payments. Payments were made in December each year based on the report of the Verification Team. Payments were made by cheque and deposited directly into the CFMG account.

Current Status

The first PES agreement between the Yakpugang CFMG and the Mongar Municipality ended in December 2013. Currently, the WMD in collaboration with SNV Bhutan is processing the renewal of the agreement. The parties have agreed in principal to participate in a new PES scheme, but as they did during the design of the initial scheme, the ES buyers have pointed to other users who were not party in the earlier scheme. Similarly, the ES providers also have raised concerns regarding the 100meter buffer zone along the streams where most of the timber stocks lie.

To this end, the new PES team is exploring the inclusion of additional buyers and undertaking an opportunity cost analysis for the six identified activities. The team aims to renew the agreement by the end of 2014.The process is tied in with another project, “Integrating PES & REDD+ in Bhutan”, which aims to explore some more PES sites across the country and develop a framework and implementation manual to be used by field personnel for new PES schemes.

Opportunities and Challenges

The first established PES scheme only considered drinking water protection, but there are opportunities to include other ES such as carbon sequestration, biodiversity conservation and links with hydropower generation. The established scheme will also have strong demonstrative

impacts for upscaling in other areas. Aside from providing financial incentives to the local communities, this process will also help provide environmental education and subsequently contribute to the pursuit of Gross National Happiness and 60% forest coverage for all times to come.

However, there are also challenges currently hindering the promotion of PES in Bhutan for the sustainable management of watersheds and ecosystem services. The WMD is currently the only agency dealing with the PES and its staff have limited technical knowledge on how to implement new scientifically-based PES schemes. The process that the team followed in Yakpugang may not be transferable to other areas which may have less favorable conditions. Most importantly, most people lack awareness on PES despite the WMD's efforts to date. Many think of it as a source of conflict for the future. Therefore, there is a long way to go before the general population accepts PES for what it is.

Recommendations

The following recommendations are provided for the promotion of PES initiatives in Bhutan:

- First of all, there is an urgent need for capacity development in identifying ES, Valuation of ES, providing relevant guidance, etc. Even the WMD as the nodal agency for PES lacks a detailed understanding.
- Capacity development is also required on how to bundle up ES such as drinking water, irrigation, hydropower, recreation, scenic beauty, tourism etc. Such bundling would return more incentives to the service providers.
- There should be repeated awareness programs for stakeholders to have a better understanding on PES.
- There is also a need to explore PES based on Human Wildlife Conflict (HWC) considering it as a burning topic at the present time.
- Donor agents and government agencies should provide additional funds on top of payments made by the service users to help speed up the establishment of new PES schemes.

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INTEGRATING PAYMENT FOR ECOSYSTEM SERVICES (PES) TO STRENGTHEN ENVIRONMENTAL GOVERNANCE IN THE INDIAN HIMALAYAN REGION

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Summary

Mountain ecosystems provide a range of goods and services to well over half of the global population. However, in recent times, around the world, mountains are facing pressures from various quarters including that posed by climate change. To respond to the challenges, valuation of ecosystem services (ESs) and integrating Payment for Environmental Services (PES) is an emerging approach being tested presently in different countries to strengthen environmental governance at all scales particularly at local level. The approach is to develop a framework of national accounts which is able to express, the depletion of natural resources and its consequences quantitatively in economic terms impinging on the wellbeing of human societies in the long run, and therefore to help raise awareness on the necessity of promoting green development. Yet, valuation doesn't necessarily mean to put price tag on every ecosystem service but depending on the situation and context in hand, besides monetary/economic; these could be valued using other instruments such as education & awareness, policy and law, and technology. If followed, the principles of green economy have potential to turn things around in changing the present day GDP centric development thinking to overall wellbeing of nature and human societies by recognizing the value of natural resource rich regions like the Himalaya.

While citing a few examples, the present paper presents the efforts being made regarding valuation and integrating (PES) from the Indian Himalayan Region (IHR), and argues that mainstreaming different types of PES schemes in development agenda has potential to augment local livelihood and conserve natural resources in the region. However, this is easier said than done. For wider acceptability and sustainability, it is essential that the PES models are economically viable and potential enough to draw young people to meet their socio-economic aspirations in present day context. Examples provided in this paper clearly indicate that at the moment small scale/local level application of PES is possible but implementation at larger scale is still riddled with a number of issues. Given the enormous challenges related to policy, institutions, science & technology, socio-economic, and markets vis-à-vis valuation of ESs and therefore devising appropriate PES mechanisms, local people in the Himalaya would certainly need major PES schemes which are not necessarily dependent on markets for enhancing their participation in natural resource conservation and management.

Background

Mountains cover over 25% of the Earth's land surface and are home to nearly 12% of human population globally. Mountain ecosystems are providers of innumerable goods and services such as water to more than half of the global population, characterized by high levels of biodiversity

and species endemism, and account nearly one-fifth of the tourism industry across the globe (Price, 2004). Local communities, through their traditional norms and practices, evolved over centuries, have been playing a vital role in sustainable management of mountain ecosystems and could be considered as the natural conservationists (White et. al., 2004). On account of these values, of late, policy makers, conservationists, and development practitioners consider it highly important to protect mountain ecosystems and provide support to local communities in order to ensure long-term sustainable development, poverty alleviation, and transition to green economy at global scale.

Himalaya, the youngest, vastest, and loftiest mountain chain in the world covers about 17% of India's geographical area along its northern boundary and home to over 4% of its population. The Indian Himalayan Region (IHR) stretches over 2,500 km with width varying unevenly from 150 km to more than 500 km at different places while the altitude varies from 300 m in the foothills in the south to well over 7000 m in the perpetual snows in the north. Based on variation in climate, forest types and biodiversity, agriculture practices, and culture, the IHR could be divided into two broad sub-regions namely the Western Himalaya and the North-Eastern Himalaya. States of Jammu & Kashmir, Himachal Pradesh, and Uttarakhand are the part of former while Sikkim, Arunachal Pradesh, Meghalaya, Manipur, Mizoram, Nagaland, Tripura, and hill areas of Assam and West Bengal are of the latter. Temperate forests, settled agriculture, and traditional societies are the major characteristics of the western Himalaya while dominance of tropical evergreen and moist deciduous forest types, shifting agriculture, and a large number of tribal societies are the major features of north–eastern IHR (as cited in Semwal, 2010).

The diverse ecosystems of the Himalaya nurture a high level of floral and faunal diversity, and hence a large portion of the region has been recognized as one of the 34 global hotspots of biodiversity. More than 65% of the geographical area of the IHR is under forests representing one-third of the total forest cover and nearly half (46%) of the very good forest cover of the country (Planning Commission Task Force Report, 2010). High species endemism makes the region an exceedingly significant area from the conservation and resource planning point of view. Being the rich source of water, the Himalaya is fittingly called as a major water tower or third pole on the face of the Earth. The dense forests of the region help feed sub continent's perennial rivers such as the Indus, the Ganga, and the Brahmaputra along with their numerous tributaries that are the source of drinking water, irrigation, and hydropower benefitting over a billion people of south Asia (G-SHE, 2010). The traditional agroecosystems of the IHR (the backbone of subsistence economy of mountain people) are heavily subsidized through biomass and energy transfer from the surrounding forests that provide food security and also maintain land races of food crops (Singh and Singh, 1992, Maikhuri et. al., 1997 & 2001). In addition, the importance its cultural heritage and spiritual contribution to the wellbeing of not only to the people of India but world as a whole is also well recognized (as cited in Semwal, 2010).

However, as stated above, being the youngest and loftiest, the Himalaya is naturally unstable, fragile, and prone to natural disasters. Evidences of disasters such as in Leh in 2010, Kedarnath, 2013, Kashmir in September 2014, and a number of other bigger & smaller events indicate that the Climate Change induced extreme weather events have been increasing in frequency and intensity in the region in recent times. Further, lesser emphasis on "Mountain Perspective" in development planning has created a high demand for natural resources often resulting in

accelerated soil erosion, drying up of springs, habitat fragmentation, biological invasion, loss of biodiversity and hence at times degradation of ecosystems in the region.

Conservation of the Himalayan ecosystem is *sine qua non* not only to preserve its pristine beauty and spectacular landscapes, but also to ensure the ecological security of the entire Indian sub-continent. The National Environment Policy (2006) recognizes it, that unless the conservation measures address the question of livelihood security of people, they will not be successful. In this regard, it is important to bring in "Mountain Perspective" across policies, programmes, schemes and projects meant for sustainable development of the Himalayan region. In this regard, among others, the emerging approach of valuation of ecosystem services (ESs) and integrating Payment for Environmental Services (PES) being tested in different countries holds immense promise in the Himalaya as well where local farmers are often marginal. Under these conditions, well targeted and soundly-designed PES schemes for sustainable land and resource management have the potential to contribute towards conservation and development goals in the Himalayan region.

i. *What are Ecosystem Goods & Services?*

All physical, biological, and chemical processes that sustain ecosystems are called ecosystem functions viz., biomass productivity, nutrient cycling, energy fluxes, food-web, succession etc. Ecosystem functions generate ecosystem goods and services but functions and services do not necessarily show one-to -one correspondence (Singh, 2002). Accordingly ecosystem services are defined as "a wide range of conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfil human life" (Daily, 1997).

Thus, ecosystems provide a variety of goods and range of services to society, which in turn directly contribute to the overall wellbeing and creation of economic wealth (Costanza et al., 1997; Millennium Ecosystem Assessment, 2003 & 2005; TEEB, 2010; de Groot et al., 2012). Ecosystem Goods are the direct benefits that the humans derive from ecosystems such as food, fiber, Non Timber Forest Products (NTFPs), water etc., which are well known ingredients of market economy and lumped as "Provisioning Services" (Millennium Ecosystem Assessment, 2005). However, the intangible benefits known as Ecosystem Services (ESs) categorized as "Supporting Services" (soil formation, nutrient movement from one ecosystem to another, biodiversity and genetic resources, and succession etc); "Regulating Services" (climate moderation, carbon sequestration, disease and pest control, dissipation of waste and toxin removal, air and water purification, pollination, and hydrological regulation); and "Cultural Services" (recreation, spiritual, aesthetic, educational) for majority which market doesn't exist (Millennium Ecosystem Assessment, 2005).

Based on available scientific knowledge, it could be safely stated about the status of ESs: i) these are essential to human civilization; ii) these operate on such large scale, complex and little known ways that majority cannot be replaced by human deeds or available technology; and iii) human activities are already damaging the flow of ESs on a large scale (Daily et. al., 1997). Hence there is vital need for identification and monitoring of ESs at all scales and for including their value into decision-making processes. In this regard, the release of the Millennium Ecosystem Assessment (2005) was an important landmark in emphasizing the need to better understand, quantify and value the ESs ecologically, culturally and economically. Therefore, since last one decade, the concept of valuation of ecosystem ESs & PES is becoming

increasingly popular across the globe.

ii. *Valuation of Ecosystem Services*

Ecosystem services are worth many trillion of dollars annually (Costanza et. al., 1997). Yet most of these benefits except "provisioning services" carry no price tags that could aware society about the changes in their supply due to deterioration of ecosystems that generate them (Daily et. al., 19997, 2009). Healthy ecosystems are part of natural capital and the flow of ESs on which humans depend could be considered as the "interest" ensued on that capital (Perrings et.al., 2006). It depends on societies how they invest in the capital i.e. on the conservation of ecosystems to maximize flow of the "interest" i.e., of ecosystem services for their overall wellbeing considering the fact that till recently we often took them for granted and seldom invested efforts to conserve ecosystems from ESs standpoint per se. In order to make comparative ecological economic analysis possible, a common yet flexible framework for the broad quantification and valuation of ESs is the need of hour as large-scale land use/land cover changes are degrading natural ecosystems and hence diminishing supply of ESs. This in the long-term will offset the tangible short-term benefits arising out of developmental activities which do not take into account their impact on ecosystems (Rudolf et. al., 2002).

With increasing awareness in recent times, efforts are being made to put some indicative values on ESs in monetary terms as there is already a critical need of integrating ecological /environmental concerns in economic concepts (Daily et. al., 1997; Singh, 2007). If ESs are included as capital assets in economic production activities it would change the existing view of macroeconomics history (Dasgupta, 2009). The valuation of ESs approach is to build a framework of adjusted national accounts to show, in economic terms, the depletion of natural resources and its implications for the wellbeing of human societies in quantitative terms, and also help raise awareness on the necessity of promoting green economy (Neuman et. al., 2010). However, considering the scientific, technological, socio-economic, cultural, policy and institutional challenges, the valuation of ESs face at different scales, it is not obligatory to put price tag on every ES but depending on the prevailing context could be valued using other available instruments as stated above.

Valuation is a balanced approach for conservation of ecosystems that calls to conserve whatever remains and restore areas where it is possible, rather than spending time and resources on selecting biodiversity rich areas exclusively. Thus, besides giving importance to biodiversity, the approach also enables societies recognizing the importance of not so species rich ecosystems generating services of intrinsic value for conservation such as boreal peats (sequestering significant amount of terrestrial carbon), fresh water ecosystems, and the western Himalayan ecosystem providing a huge amount of services to downstream people in India (Singh, 2002).

If put into practice, this would help promoting principles of green economy having potential to turn things around in changing the present day GDP centric development thinking to overall wellbeing of nature and human societies by recognizing the wholesale value of ESs and the natural resource rich regions like the Himalaya. This demands radical change in thinking and putting in place enabling policy and institutional framework (Singh, 2002).

iii. *Payments for Environmental Services (PES) and the Significance of the Approach*

Payments for environmental services (PES) are part of a new and more direct conservation model, clearly identifying the need to link the interests of service providers with beneficiaries.

Thus, PES mechanisms are meant to reward those who contribute towards providing ESs voluntarily often in economic terms through payments from those who consume the services. However, payment or rewards to service providers through mediators such as the government PES schemes have become a prevalent policy instrument for promoting sustainable natural resource management and livelihood security in many developing and developed nations alike (Antle and Stoorvogel, 2008). As such, around the globe, PES schemes have been applied within a number of mountain ecosystems and landscapes for purposes that include watershed protection to maintain regulated supply of water for urban populations, biodiversity conservation, and mitigating climate change impacts/ carbon sequestration (Neuman, et.al. 2010). Payments directly by receivers or through intermediaries or providing incentives in other terms by these can help make the sustainable management option more prominent, and thus sustain conservation-friendly land practices by service providers.

PES is a direct approach which helps participation and creating awareness and appropriate institutional mechanisms linked to rewards and not based on business as usual principle of polluters pay but beneficiaries paying or willing to pay/reward the conserving communities (Neuman, et. al. 2010). It may help socio-economic development of local communities and thereby help making conservation locally sustainable. Putting PES in place would help redefine conservation priorities from only biodiversity-centered approach to balanced approach as valuation would be based on knowledge that is more scientific and informed opinion of stakeholders (Singh, 2002).

In the Himalaya, except for a few preliminary studies viz., by Singh & Singh (1992), Singh, (2002, 2007), Singh et. al., (1992), Verma (2000), Haripriya et. al. 2003, 2005 (Green Accounting for Indian State Project), Negi and Agarwal (2006), Semwal et.al. (2007), Negi and Semwal (2010), and Singh and Thadani (2013), quantification and valuation of ESs is an emerging discipline in India itself and therefore so far has not been comprehensively attempted in the region. This calls for taking up coordinated efforts related science, policy and practice of quantification and valuation of ESs of Himalayan ecosystem having global, regional, national and local characteristics and benefits **(Table 1).**

Table- 1 Characteristics of some of the key Forest Ecosystem Services of the IHR

Ecosystem Service	**Benefits**			
	Local	**Regional**	**National**	**Global**
Carbon Sequestration				√
Landscape Beauty/Recreation	√	√	√	√
Agro-biodiversity	√	√	√	√
Soil Fertility Maintenance	√	√		
Hydrological Regulation and Climate Moderation	√	√		
Succession (Land slide/slip stabilization	√			
Pollination	√	√		
Non Timber Forest Products	√	√	√	
Grazing	√			

After Semwal et.al.2007.

After presenting the basic concept in the context of IHR above, this paper tries to highlight how valuation of ESs and different PES schemes, though not all of them can be called PES in strictest sense, are of particular relevance for sustainable development of Himalayan region. The paper discusses key lessons learned so far and challenges for designing appropriate frameworks for effective implementation of PES in the IHR.

Valuation of Ecosystem Services and PES in the context of the Himalaya

As described above, besides C-sequestration, Himalayan ecosystems particularly forests covering about two-thirds of its geographical area and representing one-third of the total forest cover and nearly half (46%) of the very good forest cover of the country provide a range of environmental services such as soil formation, hydrologic regulation, and maintaining suitable moisture regimes for the rich and highly endemic biodiversity to the adjacent Gangetic plain (GP), one of the most productive agricultural areas of the world. The Himalayan ESs have been keeping GP fertile and robust since over thousands of years without extensive degradation (Singh 2007). These ESs are important for the wellbeing of not only more than 50 Crore (500 million) people living in the GP but also for over 4 crore (40 million) local people of the IHR as the traditional agriculture (the mainstay of local subsistence economy) is heavily dependent on surrounding forests for resources. The conservation of genetic diversity of crops, livestock, fodder plants, soil microbes, and organically produced food grains and pulses in the traditional mountain agriculture of the IHR can also be recognized as services provided by the Himalayan forests (Semwal et al, 2007).

Despite making considerable contribution (as per some conservative estimates based on the prices in the year 1994, the forests of the IHR provide ecosystem services amounting to Rs 944 billion annually) in country's economic and ecological security, the ESs flowing from the Himalaya do not get adequate recognition of their contribution in the GDP of the country in the absence of comprehensive valuation and hence limited information to decision makers (Singh 2007 & Semwal et. al., 2007). Nevertheless, India is unique among developing nations to have incorporated the value of ESs of its forest rich states in national accounting (Singh and Thadani 2013). Twelfth Finance Commission (FC-XII; 2005-2010) onwards integrating environment, ecology, and climate change concerns in Indian fiscal federalism is an on-going process. FC-XII provided a grant of Rs. 1000 Crores (Rs 10000 Million) to forest rich states as policy imposes restrictions on states particularly the Himalayan states to generate revenue from timber harvesting and conversion of forest land for non-forestry purposes. The grant was **distributed in accordance with the proportion of each state in relation to total forest area of the country**. During the FC-XIII the quantum of grant was raised to Rs. 5000 Crores (Rs 50000 Million) and the allocation formula was revised further considering three factors mentioned below:

- the share of the total forest area of the country falling in any particular state;
- the share of forested area in the total area of the state is greater than the national average or the economic disability posed/ opportunity forgone by forest cover; and
- the quality of forests as measured by density.

By virtue of being forest rich, the 12 Himalayan states are the major beneficiaries under this scheme as approx. 42 % of the total grant has been allocated to these states. However, forest cover barely captures the values of a whole gamut of ESs flowing from the IHR and thus the additional funds provided could only be considered as symbolic. Yet the growing recognition at policy level on the importance of ESs and vital role these play in the sustainable development of

the country is a major advancement in area of environmental conservation. Under the overall PES framework, the example cited above may be categorised as a **Government Payment Scheme.**

Afforestation activities taken up under the aegis of Compensatory Afforestation Management and Planning Authority (CAMPA) could be considered as an example of government operated PES scheme. The Forest (Conservation) Act enacted in 1980 makes it mandatory for users of forest resources to pay compensation if their projects require conversion of forestland for non-forestry purposes. All of this money is collected in a central fund called CAMPA meant to take up afforestation activities in order to compensate the loss of forest due to change in landuse. Presently environmentalists are advocating developing and employ methods that capture the value of forests comprehensively taking into account not only the tangible but also the intangible benefits i.e. ESs provided by the forests under CAMPA funds and devise mechanisms for its efficient utilization.

Though few of the examples from the IHR described below may not necessarily be categorized as PES in strict sense, these certainly provide important lessons for developing robust PES mechanisms at local level in near future.

a. Ecosystem Services for Poverty Alleviation (ESPA) Programme being implemented in various countries across the world including in India has facilitated putting in place a PES mechanisms to protect a spring recharge zone in Palampur town in Himachal Pradesh. Processes such as geo-hydrological mapping to identify spring recharge zone, secure tenure for women's Joint Forest Management Committee (JFMC), 20 year management plan with payment agreement of Rs 10,000.00/year, and joint monitoring etc., were established to protect the aforementioned recharge zone in order to ensure regulated water supply to local inhabitants of the Palampur (Paul van Gardingen & Chetan Agarwal, presentation made at Mountain Division at MoEF & CC in 2013).

b. Kuhan and Ooch villages are the remote Himalayan villages located in Kangra district of Himachal Pradesh state. In 2003, with some help coming from a watershed development project, the villagers of Kuhan pooled resources and constructed a check dam across a nearby water source/ Nullah. The check dam helped making water available for irrigation increasing the crop production several folds and made it possible for the local farmers to grow cash crops such as fruits and vegetables. However, due to heavy grazing by the livestock of Ooch village upstream, the check dam gathered silt during rainy season reducing its storage capacity substantially within two years after its construction. The villagers of Kuhan discussed the issue with their counterparts in Ooch and arrived at a negotiated solution under which the villagers of Ooch agreed to ban grazing on its four-hectare common grazing land for certain years and plant saplings of fruit, fodder bearing trees as well as bamboo and grasses on it. In return, Kuhan paid for the saplings and even worked out an arrangement to sell irrigation water to Ooch as and when required. This is an example of PES working fine at local level (Singh, Supriya.2008, Down to Earth).

   Similarly though there is no formal regulatory mechanism to identify that the communities are being paid for a specific service provided by them, in the Great Himalayan National Park

in Himachal Pradesh, communities are paid Rs 5000 annually to protect the area of park under their petrol from forest fires (Singh, Supriya. 2008. Down to Earth).

c. Pollination is one the most vital ESs playing critical role in gene flow among all flowering plants including food crops. Among the plant species pollinated by animals, insects including honey bee pollinate nearly 80% of the flowering plants. However, in recent times, due to a variety of factors including habitat degradation and fragmentation, population of many of the pollinators is declining in certain areas resulting in decline in yield and quality of agro-horticultural produce. Apple is one of the famous horticultural cash crops of Himachal Pradesh. However, in certain areas of the state, sometimes back farmers noticed decline in apple yield with deformity on fruits. It was attributed to problem related with inadequate pollination due to decline in population of honey bees- the chief pollinators of apple. To respond to this challenge, a sizable number of local farmers started bee keeping as a business for providing pollination service to apple orchard owners. One such farmer brings nearly 200 honey bee colonies and rents them all to apple growers of the areas where deficient pollination has been identified as a problem. This brings him an annual cash income of Rs 200,000-250,000 (Pratap, U. 2010. Mountain Forum Bulletin).

d. Garhwal region of Uttarakhand state is famous for its rich agrobiodiversity. More than 40 different crops comprising cereals, millets, pseudo cereals, pulses, oil seeds, and tubers are grown in traditional agricultural system. However, until recently many of them remained lesser known to mainstream society and in the absence of knowledge these crops were considered inferior and consumption of these as a sign of social backwardness. In this backdrop, a number of the traditional crops were facing threat of extinction. Maikhuri et.al. (1997, 2001) studied the situation and published their findings in scientific journals. This helped in attracting the attention of a large number of people from different walks of life and with growing knowledge about the nutritional and medicinal qualities of many of the traditional crops, the market demand has increased many folds in most recent times. For example, it was difficult to find traditional agricultural produce in the local market till the year 2000 and even if it was available seasonally, fetched very low price for the farmers. Within a short- span of time, the prices have increased at least 6-10 times especially of traditional pulses and also their availability in the local market benefitting both the farmers and the sellers. The trend is continuing and now entrepreneurs are engaged to add value to traditional crop products which is expected to help providing higher monetary benefits to the farmers. The example highlights the utility of education and awareness as an instrument of valuation of biodiversity.

e. In many villages in Uttarakhand, people employ a variety of measures to develop village commons for various ecosystem goods viz., fodder, fuelwood, leaf litter, wild edibles, timber etc., depending on the prevailing biophysical condition and tenurial system. Bhimli Malli located at 1500 m amsl village in Pauri district of Uttarakhand is one such village where a number of traditional practices were in vogue to derive a range of resources from different types village commons. Protection to ground vegetation is provided to a substantial chunk of land adopting watch and ward methods from grazing, fire, and direct harvest of fodder. The fodder lots locally called Ghasnis are opened for harvest and subsequently for grazing during autumn, winter, and early summer months. At the time of opening of a protected Ghasni, each household's share is demarcated generally within a rectangular piece of land, locally called as "Maange". A few households whose fodder requirement is either low or they have

other sources to fulfil the requirements; can sell their share to other households who need more fodder. The rates of fodder were fixed based on mutual understanding or prevailing rates in the area. On a few occasions auction of such grass lots was also practised – a system close to PES at local level. This system is quite rewarding to the households those are still dependent on livestock for their subsistence living (source: Negi, G.C.S. & V. Joshi 1996, and Semwal et. al., 2007.)

f. Dhanolti is a very small township located at 2200 m amsl in Tehri Garhwal district of Uttarakhand state. It is just 25 km away from the famous hill town of Mussoorie. Being surrounded by dense deodar and oak forests, it is scenic town and has emerged as one of the popular tourist destinations on the tourist map of Uttarakhand. More than hundred thousand tourists visit Dhanolti every year particularly during peak summer months of April, May and June. To capitalize the opportunity and respond to the challenges that the burgeoning tourism may pose to local environment, the State Forest Department of in partnership with local people constituted Dhanolti Eco-Tourism and Eco-Development Committee (DEEDC) to minimize the impacts by taking up a number of regulatory measures as well as developing appropriate infrastructure. The DEEDC has been able to develop tourism infrastructure at Dhanolti by creating two eco- parks in about 18 ha forest land, and a total of eight tourist bamboo huts.

   DEEDC ensures maintaining cleanliness and efficient solid waste management in the Dhanolti Township. Plastic and polythene waste is sold for recycling and the dung of mules and horses is turned into organic manure. According to records of the committee, a total of over 205,000 tourists visited Dhanolti between April 1, 2009 and December 2010. The main sources of income of DEEDC are: collection of entry fee in Eco-Parks (Eco-fee), tariff from bamboo huts, fee for availing adventure activities inside eco-parks, parking fee, annual contribution by members, and plantation of saplings by tourists under “Smritivan” concept inside Eco-Parks. According to DEEDC, the income of the committee roughly varies from Rs. 20-30 lakh per year. Of the total income of the DEEDC, 20 % is transferred to formal sector partner i.e. the SFD, 40% is used to compensate active and trained members of the Executive Body of the committee, 30% for maintenance of the tourism infrastructure, and the remaining 10% is deposited in corpus fund of the committee. The trained local members of the committee receive a monthly honorarium ranging from Rs.3,500 to 6,000/month (personal study carried out by first author jointly with Dr. R.K. Maikhuri in 2011).

g. Valley of Flowers National Park (VoFNP) established in 1980 in the state of Uttarakhand. In 2005, the park was included as second core zone of the expanded Nanda Devi Biosphere Reserve- a World Heritage Site. The VoFNP protects one of the most beautiful high altitude (3300m to 6700 m amsl) mountain ecosystem of the western Himalayan phyto-geographic zone, where more than 600 species grow in just about 24 km2 area as ~73% of the total area of the park remains perpetually snow covered. Many of these species are globally rare, endangered, and threatened (RET). The park is also the habitat of the endangered snow leopard, black bear, musk deer, and blue sheep (www.conservation-development.net/WCMC_Nanda_Devi_Valley).

   Prior to the creation of the park, the villagers of Ghangaria and Bhyundar used to graze their livestock in the entire high altitude area of Bhyundhar valley including the valley proper

during summer season. Since the creation of the VoFNP, grazing has been completely banned in the park, however, increasing pilgrimage and tourism in the area (by virtue of being in the close proximity of famous shrines like Sri Badarinath and Hemkund Sahib) has opened new avenues of income generation for these people. Adapting to the new reality of earning the economic benefits from the emerging venture of eco-tourism, they are now supportive of the Park and contribute in the protection of the unique and rich biodiversity of the VoFNP. The State Forest Department (SFD) and the local communities have formed Eco-Development Committees (EDCs). The EDCs at Bhyundhar and Govindghat provide support to the Park management and look after the waste disposal (estimated over 70 tonnes in 2003-2004) and management of visitors' (4000 tourist visited the valley in 2004 alone) amenities outside the Park. The EDCs spread awareness among the visitors and local people on the importance of conservation of biodiversity and ensuring habitat integrity while successfully running the interpretation centre at Ghangaria near the entrance of the VoFNP.

Similarly EDCs constituted in several villages viz., Lata, Reni, Peng, Tolma etc., located in the buffer zone of Nanda Devi National Park have been provided support by the SFD for managing growing eco-tourism in the area. With the help of external support from national and international conservation organizations, a range of people friendly activities are being implemented since the creation of the reserve (Gopal et.al.2011). Many of these interventions including desired change in management policy are encouraging as there is a perceptible change in people's attitude towards park. (www.conservation-development.net/WCMC_Nanda_Devi_Valley). In addition the famous Corbett National Park in the state generate revenue worth several hundred thousand rupees annually for state forest department, while providing income generating opportunities for local people.

h. Khechiopalari is a highly scared and scenic lake located in the west district of Indian state of Sikkim. To conserve and manage the immediate catchment area of this scared lake visited by a large number of tourists and pilgrims every year, the State Forest Department has helped creating a local institution, registered with it, called Khechiopalari Pokhari Conservation Committee (KPCC). The effectiveness of the management of the lake could be measured by the fact that with an entry fee of merely Rs 10/ person, KPCC collects Rs 10-12 Lakh per year from the pilgrims and tourists which is utilized again in addition on various conservation and management activities to providing meaningful employment to several local youth. Similarly, at Yuksam in west Sikkim, a small sacred lake is managed by the local village Panchayat using Mahatma Gandhi National Rural Employment Guarantee Scheme funds. The Panchayat has utilized the funds by constructing a boundary wall around the sacred water body to protect it as well as establishing an entry fee collection booth. The money collected again utilized to keep the lake clean, maintain its scenic beauty and also provide employment to a few of the village youth (based on landscape Yatra report by the first author).

i. Khangchendzonga Conservation Committee (KCC), a well-known Civil Society Organisation based at Yuksum in west Sikkim district has been playing a pivotal role in the conservation of natural resources and livelihoods of local people around Yuksum located in the vicinity of famous Khangchendzonga Biosphere Reserve (KBR). KCC promotes community based ecotourism through initiatives like home-stays and zero waste in the area. According to it, presently more than 70% households around Yuksum are directly dependent

on nature tourism for livelihoods. Among various stakeholders engaged in the venture, the income from tourism is in the following order: travel agencies earn > pack animal operators> tourist guides> cooks > porters while among infrastructure service providers it is highest for big hotels following by restaurant owners, home-stays, small hotels and taxi drivers, respectively (based on landscape Yatra report by the first author).

j. Lake Nainital and its forested watershed provide a lot of direct and indirect use values. One such ESs is reduction in silt load due to forests and the cost savings from in dredging activity. Estimates suggest that the soil and silt loss during rainy season in forested area is only 12% that of non-forested areas implying that the forests provide service in terms of minimizing soil loss, which is about 3175 t from the entire forested area. Reduced siltation of lake also contributes in maintaining clean water in the lake and enhancing its value from tourism view point. The cost of removal of silt from the lake has been estimated minimum Rs. 200,000 annually for this amount of deposition of silt. The total tourists visiting Nainital were close to 0.4 million per year during the time when the report cited below was prepared. According to an analysis based on travel cost methodology, the value derived (from tourism for the Lake Nainital and its watershed) was Rs. 4.3 million (i.e., Rs. 3,020 per ha) to Rs. 6.5 million (i.e., Rs. 4,260 per ha) (Source: Integrated Management of Water Resources of Lake Nainital and its Watershed: An Environmental Economics Approach; Final report submitted to EERC, 2001-02 by Singh, S.P. and Gopal, B. as mentioned in Semwal et.al. 2007).

PES: Lessons from the IHR

Market based PES for ecosystem services are still in early stages of development and therefore it is a bit early to think about preparing a PES blueprint for accessible and enduring markets at the moment amidst a number of challenges the scheme faces including related to use of non-monetary instruments of valuation **(Box-1).** However, some initial lessons are noticeable:

1. For majority of ESs, often the payments are made notionally by a dominant buyer rather than commensurate to the amount of services availed. In this regard example of Palampur town of Himachal Pradesh as cited above, state forest department agreed to pay Rs. 10,000 per year to JFMC for the upstream watershed service. The JFMC simply conserve forests, and no one monitors using scientific tools whether forest protection has been actually contributing to improve water quality and yield (Singh, 2012; Singh & Thadani, 2013).

2. Similarly, the 12th and 13th Finance Commissions of India agreed to incorporate the value of forest ecosystem services of Indian states in national accounting considering area under forest and quality of forests as defined by density as the criteria to allocate grants to forest rich states without quantifying the quantum of flow and use of ESs. Obviously the additional funds are granted to states to protect forests and not a PES *per se* having market linked human context (Singh and Thadani 2013) and also how the better managed forest divisions and local institutions within a given state would be rewarded. Analogous is the case of providing funds to local institutions such as Ecodevelopment Committees (EDCs) around PAs to protect the biodiversity. Though conservation measures taken by EDCs must be helping in the biodiversity and protection of a bundle of associated ESs inside these such as carbon sequestration, watershed and landscape beauty are seldom quantified to determine the allocation of funds to a given EDC.

Box-1

Challenges for Valuation and Integrating PES

Economic:

- Application of Total Economic Valuation tools are constrained when equity and sustainability are considered;
- As per Skeptics economic valuation of ESs may promote privatization of even air and water and thus not necessarily help local communities and restoration of degraded ecosystems;
- Being highly anthropocentric, economic valuation and PES approach does not appreciate the intricate relationship between myriad life forms and therefore may lead to discarding and degradation of ESs which are not essential for humans;
- When ecosystems are not necessarily connected, it is difficult to generate national aggregate indicator for ESs which are not traded in the market;
- Even if economic values of ESs are calculated, they may not necessarily reflect the values of such services comprehensively;
- How the landless impoverished sections of the society would be taken into account to reward their conservation efforts?

Education & Awareness:

- Scientific proof of relationship between restoration of degraded ecosystems and enhanced flow of ESs from such ecosystem in short-term;
- Since valuation heavily depends on the level of awareness among the beneficiaries in such a situation how the varying perceptions regarding different ESs in the society would be addressed; and
- In the above backdrop, what should be the communication strategy targeting different stakeholders?

Policy/Institution and Law:

- **Would require new institutions and capacity building measures to realize benefits**
- Since ecosystem services are often provided locally or regionally which should be the reporting scale? At smaller scale, mechanisms for valuation and PES are easier to be put in place but these are riddled with complexities at regional in general and transboundary scale in particular.
- How to decide that who should benefit local communities/ larger communities/future generations?
- How the approach of valuation of ESs & PES be linked to Environmental Governance that ensures enhancing bargaining power of local communities, key to equity
- Presently different types of markets such as government operated, business to business and mitigation market have been functioning as Monopsoinies i.e. a dominant buyer and multiple service providers but how to deal with the most common situation of multiple providers and beneficiaries?

Science & Technology:

- Scant understanding about the generation processes of different types ESs
- Problem related developing methodology for quantification and base line information especially geographically mobile services.
- Some ESs are not so easily measured (e.g. aesthetic services) or provide complex, regionally specific benefits that we may not yet know how in quantitative terms (e.g. Biodiversity, role of Himalaya in maintaining moisture in adjacent plains or climate regulation etc.,)

(Source: based on multiple published sources)

3. Market cannot be created without demand and except for few ESs such as provisioning services including water, carbon sequestration, and eco-tourism linked to landscape beauty, for majority of ESs there is hardly any demand and hence market as these are taken for granted. In this case, efforts are required to generate knowledge and spread mass awareness in order to generate willingness to pay in the society.

4. From majority of examples related to PES particularly at regional and national scales, the role of government as a supporter and promoter of PES is extremely crucial. The role of government becomes equally important for maintaining equity and protecting the interests of impoverished sections of the society and marginal Himalayan farmers.

5. Linking livelihoods with PES mechanisms built around ESs like carbon sequestration, biodiversity, watershed, and cultural hold a great promise in the IHR by virtue of the fact that majority of people depend on natural resources for subsistence. In Himalaya PES mechanisms those encourage community participation in sustainable natural resource management especially forest management and watershed conservation may be promoted including REDD+ (Box-2).

6. There are several challenges related to valuation of ESs while using instruments like economic, policy & law, education and awareness, and technology and hence putting in place effective PES schemes at all scales for diverse ESs.

Box-2

Indian Himalayan Context where PES may be put in place

Carbon Sequestration and Storage:
- Corporate Sector paying communities for planting trees; through CDM/VCM already in Place.

Ecosystem/ Biodiversity Protection:
- Conservation donors/Governments/Education and Scientific Institutions pay/reward local people or institutions (FPCs, VPs, Scared Grove committees etc) for biodiversity protection and regeneration.

Watershed protection:
- Downstream water users pay/reward upstream farmers/communities for adopting land uses that minimize deforestation, forest degradation and hence flooding and reducing use of chemical pollutants;
- Hydroelectric company pays upstream communities to protect and manage good vegetation on slopes and minimize silt load in streams.

Scenic/landscape beauty:
- Tourist operators and hoteliers/ Education institutions pay/reward local communities/ EDCs, Van panchayats/ Anachal Samitis etc to conserve natural ecosystems;
- Formal sector promotes community based ecotourism around Protected Areas.

Source: Developed based on available published sources

Governance issues related to Valuation & PES

The GDP growth percentage continue to be the universally recognized yardstick to measure development and human wellbeing in decision making processes, though attempts are also being made to refine it further through incorporation of indices like human development index, environmental sustainability index and green accounting in most recent times. There is a need to bring about change in this thinking pattern, and recognize and value of natural capital. With emphasis exclusively on GDP, forested/natural resource rich regions such as Himalaya get economically belittled. The emerging approach valuation of ESs to build a framework of adjusted national accounts will show, in economic terms, the depletion of natural resources and the health costs of pollution in quantitative terms, and will also help raise awareness on the necessity of promoting green economy. The framework of green economy has the potential to bring about a paradigm shift in recognizing the value of natural resource rich regions like the Himalaya and bring about substantive change in the present GDP centric development and human wellbeing approach.

The indicators namely human development index and environmental sustainability index reflect on qualitative measures of sustainability, however, valuation of ESs can be utilized as quantitative tool to evaluate the sustainability of the development. It has the potential of providing an unbiased and dependable national framework to value so far unaccounted ecosystem benefits and also to utilize existing research outputs in a manner that makes it useful for developing meaningful policy interventions (Haripriya *et. al.*, 2006).

The local communities in the Himalaya are exceedingly dependent on forests and biodiversity for subsistence and therefore conserve these by establishing a variety of local institutions such as sacred groves, Van Panchayats, Anchal Forests etc. By imposing self-restrictions on the unregulated use of forest resources, local people contribute in avoiding deforestation and forest degradation. However, so far marginal Himalayan communities have remained outside carbon trade and resulting payments because of the complex and uniform rules and regulations developed internationally condoning mountain perspective on the one hand and lack of relevant capacity of local communities to take benefits from international mechanisms such as CDM, voluntary carbon markets (VCMs) and REDD+ (Singh, 2012). This calls for simplification of not only the international procedures in vogue but also in fact putting in place enabling policies and institutional arrangements that encourage and facilitate ecosystem communities for accessing benefits swiftly in most transparent manners. As stated, this is particularly important in the context of local communities of the IHR who have a great potential to be benefitted from large pool of forest carbon they conserve through avoided deforestation and forest degradation following their traditional norms and practices. To make this happen, strengthening environmental governance is a prerequisite so that the traditional as well as formal conservation institutions at local level are able to leverage incentives from national and international conservation programmes, schemes and projects to be able to bring desired change (Singh & Thadani, 2013).

Conclusions

It is evident from many studies that human induced pressure is beyond carrying capacities of ecosystems in many parts of the Himalaya but with growing outmigration from the region some mountain areas are facing threat of depopulation. Often it is perceived that outmigration helps in decreasing pressure on natural resources. But situation will not necessarily help in conservation

of natural resources as humans are indispensable to manage ecosystems and hence are providers of ESs such as recreation, culture and agrobiodiversity. The green economy has the potential to address issues of inequality between rural and urban dwellers as well as establishing upstream-downstream linkages so essential for improving the balance in favour of natural resource rich Himalayan region (Singh & Thadani, 2013). Applying various instruments to value services generated by mountain ecosystems and putting in place appropriate PES mechanisms to provide benefits to local communities would certainly strengthen participatory approaches i.e. local environmental governance for conservation of Himalayan ecosystems.

In present times, while global initiatives are vital to support monitoring natural resources at local level, these must aim at assisting local institutions to think beyond subsistence economy in order to remain relevant in the vastly changed socio-economic scenario and development aspirations of local communities. It is imperative that the present day conservation models are economically viable and attractive enough to catch imagination of young generation so that to address the issue of outmigration from the region. Given the enormous challenges vis-à-vis valuation of ESs and devising suitable PES mechanisms when such markets are still in nascent stage of development, local communities in the Himalaya would need innovative PES schemes for improving their engagement in natural resource conservation **(Box-1)**. In this regard 14th Finance Commission in addition to criteria used by 13th FC, may incentivize efforts being taken for strengthening community forestry; consider additional parameters like carbon sequestration rate as surrogate/proxy of overall wellbeing of forests, biodiversity richness, species endemism, area under Protected Area Network and eco-sensitive zones and thus opportunity forgone in favour of watershed protection and maintenance to compensate the forest rich states of the country while raising the quantum of grant substantially (Singh & Thadani, 2013). Further, within a given state mechanisms would also be required to use allocated resources in a manner that adequately reward conserving communities commensurate to their efforts.

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NEPALESE EXPERIENCE ON PAYMENT FOR ECOSYSTEM SERVICES (PES)

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Summary

The scientific information regarding Climate Change condition is very limited, but the rapid changes are felt and distinct effects are seen in different aspects of ecosystem. The effects of the CC are incomparable with the contribution of the GHG emission in context of Nepal. The victimization as flood, disease outbreaks, forest fires are increasing rapidly without any misdeed. Nepal is adequately aware about the situation and became a party on UNFCCC and other international agreements and treaties related on reducing climate vulnerability and risks. Based on the local observation and the international obligations, Nepal has put forward different rules, regulations and guidelines on environmental safety and reducing vulnerability with climate change. Pay for Environmental Services (PES) is one of such provisions initiated in later days. Majority of the existing rules and regulations are supportive to adopt PES, however very few examples i.e. Kulekhani hydropower royalty distribution mechanism and Buffer zone of the Protected areas under the Buffer zone Regulation, 1995 are some of the prominent examples on it. The upcoming rules regulations and budgetary provisions are friendlier in addressing issues related to environment and its sustainable use of the Natural Resources.

Key words: climate change, payment of environment services,

Background

General Circulation Models (GCMs) run with the Special Report on Emissions Scenarios (SRES) B2 scenario provide some useful information regarding Climate Change condition of Nepal. Based on the prediction made in this scenario, the expected rise of temperature will be up to 1.3 degree Celsius by 2050 and 3 degree Celsius by 2100 (IDS, 2014). It has already realized the effects of climate change on different aspects of life and the livelihood in Nepalese communities. The variability mainly changes the ecological regions, temperature – regime and amount of rainfall that effects on agricultural behaviors and the biodiversity loss. This effect directly imply on the different aspects of livelihood, mainly poor and the vulnerable sectors.

Vulnerability on the existing climatic condition is due to the excessive concentration of the GHGs in the atmosphere, mainly the lower stratosphere; the GHG since accumulated have been produced from the developed countries from the very beginning of the industrial revolution in the Europe. The process is continuing and some remedial agreements have been made so far in the favor of the underdeveloped countries through UNFCCC and the Kyoto Protocol. Nepal's contribution in the GHG emission in the world is almost negligible as 0.025 % in the global share. However, we are one of the most vulnerable countries in the world i.e. 4th most vulnerable country according to the maple matrix ranking (GON, 2014). It is a kind of punishment without any misdeed. Thus, we have raised our voice against those developed countries, which have to reduce their emission of GHGs more than the bearing capacity of the atmosphere and to reduce

reduce GHG emissions in significant amount within stated timeframe provided by the UNFCCC and the Kyoto Protocol. The strategic reduction of the GHGs, work on mitigating global warming and provide support for the adaptation activities for the under developed countries should start from the developed countries. On the other hand, there is still dilemma on 0.7% development aid versus support for adaptation. We are not the cause of the emission thus; it would not be our duty to reduce GHGs in the significant amount. However, we the LDCs also complied to change our behavior against the CC as well as move towards the more climate friendly livelihood options. The behavioral change is the important fact that we have to follow. The environment friendly behavior regarded as one of the main alternative options to overcome the possible difficulties created by CC. The PES mechanism is one of the options in this regard.

Introduction

Generally, the environmental services have been available without payment from the nature. Thus, the availability without paying leads towards the unsustainable use of these resources. The use of the natural resources as biodiversity habitats, watershed resources and the carbon sequestration have not being covered in the payment systems either government or public or private sectors. It is realized that the value of conservation of the biological diversity, water source and watershed conservation, and maintaining carbon sequestration as well as the importance of ecosystem services is given priority in the recent years. Payment for the Environmental / Ecosystem Services (PES) is one of the best options for the sustainable management of the natural resources that provides rewards for the forefront line conservation workers either farmer or the community for their contribution in maintaining good health of the natural resources and penalty for the polluters who jeopardize the natural system. The term 'environmental services' and 'ecosystem services' have been using interchangeably. The term 'ecosystem service' is more common in the recent days.

Payment for the Ecosystem Services (PES) is a concept, in which the market and non-market entity of a certain Ecosystem is in account in its value. Gautam (2011) quoted Eagle et.al.2008, Landell-Mills & Porras 2002, Pagiola 2002 when the non- market value of certain ecosystems is higher than the market value of the same, the alternatives valuation needs to be established of goods and services as a PES. Millennium Ecosystem Assessment (MEA), 2005 primarily defines the ecosystem, as "*a dynamic complex of plant, animal and micro-organism communities and the non-living environment interacting as a functional unit*." In the same document, the ecosystem services are divided in four different categories as Supporting, Provisioning, Regulating and Cultural. Such services indicated in the Walter, 2005 as an Ecosystem Services are not included in the market frame until to date. However, these services effect tangibly and/or intangibly in the human wellbeing in different ways of life requirement as food security, basic needs of daily life, health, cordial social relation and freedom of choice and action. Some scientists have urged the ecosystem services as Carbon sequestration and storage, biodiversity conservation, watershed conservation and aesthetic value of landscape etc.

Basics of PES

The emergence of the market has established the two fundamental components as seller and the buyer. The seller and the buyer compromised in a point and fixed the price of the goods and/or services in the market system. There is some more space beyond the market value of the goods and services as satisfaction and good will of the end users. The non-market value system tries to

deal, fix, and propose the value of non-tradable goods and services as the tradable item. Although it is said that market is always opaque and the non-market system is also an indirect market system working in the society for a long time. Goodwill of some company, level of satisfaction of available from the use goods and products would be one of the best examples in this regard. Similarly, services as greenery and aesthetic values available from the forest and water ecosystem are beyond the conventional thought as food, fodder, fiber and timber. The value of the non-market entities are mostly generated through the scarcity of the resources.

The value of the morning bell in the temple, birds awakening sounds in the early morning and natural forests in front of the home yards; would be some examples as ecosystem services. The value of a house in a good neighborhood, apartment with south facing, nearness of the sea-beach and homestead within the green area have greater value than the others in the developed countries. It would be an extra cost charged to ecosystem benefits from the goods and services.

Scope of PES

Forests and water resources are major natural resources of the world. Major ecosystems rely on these resources. The majority of the origin and civilization have been relayed on the forest resources and developed along the banks of the river or water resources. Major ecosystem types depend and exist within these resources.

Primarily, the poor population living and settled as a community in the mountainous area rely on the ecosystem services available from the nearby forest and water resources. The importance of the services they have obtained from the ravines, hills and dense forests has been neglected yet in the market system. Foods, fibers, fodders, medicines, drinking water, hunting, pleasures and so on available from the existing forest and water resources have a significant importance for them to sustain in such a difficult landscapes. Similarly, people living in the coastal areas have been depending in the resources available from the existing ecosystem. The Millennium Ecosystem Assessment, 2005 clearly mentioned in its second findings as "*the changes that have been made to ecosystems have contributed to substantial net gains in human well-being and economic development, but these gains have been achieved at growing costs in the form of the degradation of many ecosystem services, increased risks of nonlinear changes, and the exacerbation of poverty for some groups of people. These problems, unless addressed, will substantially diminish the benefits that future generations obtain from ecosystems.*" Thus, the value of the conserving ecosystem and its services for the future generation and providing justifiable benefit to the vulnerable people is most important. Similarly, the ecosystem and its services we are using in these days is not our own creation, but inherited from the ancestors. Thus, it is our prime responsibility to handover such healthy ecosystem services to the next generation.

The urgency of the PES is realizing in these days globally and initiated to address in different means. It also clearly mentioned that the degradation of ecosystem services restricts a significant affects on achieving Millennium Development Goals for 2015 (Walter, 2005).

Global perspectives

From the Rio 1992 conference, the world community is providing more concern on the environment related issues for the human well-being. As the time elapsed, scientists and the policy makers became more proactive in the later days. The results of the different global and

regional conferences in the early nineties and the late eighties could be coined in the form of United Nations Frame Work Convention on Climate Change (UNFCCC) and the Kyoto Protocol. The UNFCCC already crossed its infancy stage and stood as a youth of 19th year from Warsaw convention from the last year. PES is one of the economic methods realized by the scientific community for providing right to the ecosystem service producers or conservers. This scheme has been used in the developed economics, from the beginning of new millennium and they are poorly tested in the developing countries (Wunder, 2005). However, there are some more PES systems established and operationalized from tradition in rural communities of LDCs which are not still studied and documented so far.

National Policy/ strategies related to PES

The Interim Constitution of Nepal, 2007 has clearly mentioned that each citizen has right to live in the clean and healthy environment. Forest Act, 1993 is one of the strong policy documents to conserve and manage the forest resources extended to about 40% area of the Nation. It is people centric as well as the ecosystem conscious act which makes it possible to adopt the Community forests approach by nation; that is renowned throughout the world. Similarly, Soil conservation Act, 1982 of Nepal has provided special provision for the soil and water conservation issues in favor of the local users. Environment Protection Act, 1997 is one of the milestones in this regard. It has provisioned Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) as a compulsory and integral part of any kind of infrastructure development activities as well as utilization of natural resources for the betterment of the environment and the impact on the livelihoods of the local community. Social and Environmental Strategic Assessment (SESA) is undergoing in some landscapes based projects in these days in Nepal i.e. Terai Arc-Landscape (TAL) Project in the southern part of the country. Similarly, Local Self-Governance Act, 1988 is also conservation friendly, which has focused on the regulation of natural resources under the jurisdictions of the local government i.e. District Development Committee (DDC), Village Development Committee (VDC) and Municipalities. Recently, the Ministry of Federal Affairs and Local Development (MoFALD) has prepared the Environment Friendly Local Governance Guideline, 2013. It is a new approach adopted for the environment and conservation friendly society in the rural as well as the urban areas. Following are few examples of the policy interventions in Nepalese contexts. Other environment friendly policies and strategies prevailing in Nepal are as follows:

- National Conservation Strategy, 1988
- Master Plan for Forestry Sector, 1989
- Nepal Biodiversity Strategy, 2002
- National Wetland Policy, 2003
- Non-Timber Forest Products Policy, 2004
- Agriculture Perspective Plan, 1995
- Tenth Five-Year Plan, 2002-2007
- Three-Year Interim Plan, 2007-2010 and 2010-2013
- Climate Change Policy, 2011
- National Adaptation Program for Action, 2010
- National Land-use Policy, 2012
- Strategy and Dissemination Framework for the Conservation and Wise-use of Wetlands in Nepal, 2011-2015

- Integrated Landscape Planning Directives, 2012
- Tourism Policy, 2009
- Hydro-electricity Development Policy, 2001

Majority of these rules, regulations and guidelines are in the status of the review and updating as National Conservation Strategy, 1998 is being Changed into National Conservation Strategy Framework giving more emphasis to the ecological services; Nepal Biodiversity Strategy, 2002 is being updated and in the press for publication. Similarly, Master Plan for the Forestry Sector, 1998 is updated as Forestry Sector Strategic Plan. Almost all of the policy documents related with the use and management of the Natural Resources are being prepared to address the recent changes i.e. socio-cultural, political as well as the physical changes as Climate and the Environment. The documents mentioned are addressing such changes in their new version. These changes create a better avenue for the PES approach and practice. MoSTE, Nepal is one of the major stakeholders in such changes and responsible government authority dealing with the CC and Environmental issues in the National level and focal ministry of the UNFCCC.

Specific Provisions Related to ES

Terai Arc Landscape Strategic Plan (2004-14) has been dedicated to increase and regulate the environmental services covering along the southern plain of the Nation. Similarly, Sacred Himalayan Landscape Strategy (2006-2016) is another strategy supporting people in the integrated management of watersheds and river basins in the mountainous region of Nepal. Other strategies that have significant roles in environment friendly livelihood development and sustainable use options are Water Resource Conservation Strategy (2002) and the National Water Plan (2007-2013). More recently, National Planning Commission (NPC) of Nepal has provisioned to categorize the budget code spent in the sector of climate change through Budget speech for the Nepalese fiscal year 2014/2015; which has allocated about 12.8% of budget in category 1 and 10.92% budget in category 2 under the Climate Budget Code (CBC) headings[2]. All those policies, rules and regulations, strategies, guidelines and provisions have provided ample of space for using different forms of PES at ground level.

Nepal is regarded as one of the most diverse country in the world in different aspects as culture, language, geography, society and many more. Integrity in diversity is one of the distinguished characters in Nepalese society. Presence of the mountains and hills creates linkages between downstream and upstream. The direction and volume of the water flow through rural community have many meanings as drinking, irrigation, water for daily use and many more. Population growth, behavioral changes in water use and limited resources create conflicts over the society. Side by side, we have typical age-old experience in managing these resources as distribution, use and disposal. The indigenous knowledge is vital in adopting PES model in the communities in the similar regions. Thus, Nepal Government rules, regulations and customary practices support to continue the PES concept in different level.

Practical Experience

Nepal has practiced PES in the different fields such as in watershed management, protected area conservation, hydropower generation, tourism development and community forestry practices. New concept of the REDD+ open a new avenue for the PES approach in forestry sector. Nepal's

[2] Category 1/Highly relevant: if more than 60% program budget is allocated to climate change activities
Category 2/ relevant: if 20-60% program budget is allocated to climate change activities.

approaches rely on reward basis to the conservation support not the 'polluters pay' principle. Followings are some of the prominent examples executed as a PES in Nepal. Still there are more local and traditional practices in different parts of the country.

1. Kulekhani hydropower project is one of the pioneers in adopting PES concept in Nepal. It has been emerged for the conservation of upstream watersheds of the Kulekhani Stream, which has been feeding Indrasarobar Reservoir constructed in 1990 for the hydropower generation. It produces 60 MW of hydro-electricity and supplies central grid of the Nation. Twenty percent of the revenue collected through hydropower is provided to Environmental Management Special Fund (EMSF) established in Makwanpur district (Khatri, 2010) and the fund has been using in conservation and development projects proposed by the upstream communities and the watershed conservation. Reduction of the sediments in the reservoir benefits two folds benefits as increase the lifespan of the reservoir and reduces the maintenance time and costs of the powerhouse which ultimately increases the capacity of the power generation (Kunwar, 2008). It is one of the supplementary ways for the sustainable generation of the electricity, use of the natural resources and livelihood support to the upstream vulnerable community.

2. Similarly, National Parks and Wildlife Conservation Act, 1973 with its amendment in 1993 has provisioned to invest 50% of total revenue generated from the protected areas (Pas) through tourism and other sources into the local development. The fund available from the Pas has been using through Buffer-zone Management Committee. Majority of the fund should be delivered in the conservation works (30%) and local development works (30%). The other heading covers the minimum as Income Generation Activities 20%, Conservation Education 10% and Administrative costs of the Management Committees 10% according to the guidelines.

   There are many such examples supported by different organizations and practiced by the communities. IUCN supported Sardu Khola Drinking Water Supply in Dharan Municipality and Rupalake Rehabilitation Fisheries Co-operative supported by Local Initiatives for Biodiversity Conservation and Rural Development (LiBIRD) are some examples of PES. These are the examples of imparting certain percentage of the revenue generated and management by the local communities as the front-line conservator of ecosystem and biodiversity for the conservation as well as community development works. It shows that there are indirect provisions related to the PES system. Majority of the cases government play an intermediary role, and thus, there is a minimum chance of conflict between buyers and the sellers. It is possible only in the case of macro-level PES. Originally, the concept of the PES based on the available literatures has the intention to provide the direct environmental service payment to the ecosystem/environment protectors by the ecosystem service users or the polluters.
   Similarly, we have some traditional experiences to use the water related payment systems in rural communities in the hills and mountains. The management of pristine waters has been a difficulty in those areas. In some parts of the country, there is some indigenous knowledge based water distribution system among the villagers and they have some special tax systems for the water use. It became possible only due to micro-level management and conventional customary system.

3. Some government owned projects are also preparing such PES mechanisms as a pilot program. Western Terai Landscape Complex Project (WTLCP) supported to prepare a PES mechanism and Memorandum of Understanding (MoU) during 2012 in between buyers and sellers of the ES i.e., some community forest user groups as seller and water resource user groups as buyer (for use of water in drinking and irrigation purpose) in the Western Terai district of Nepal. In this case, the intermediary would be the local and independent body as civil society group dealing with the financial issues.

   These are the some examples adopted through different rules, regulations and practices in Nepal. We can observe many such practices in village level for using water sources and other natural resources based on local customary practices. Nepalese government has accepted such practices in different levels of commitments as National and International by involving different international conferences as a party, preparation of different rules and regulations combating against climate change induced disasters, environment degradation and provisioning polluters pay theory in practice.

Way forward

It has already been spelt out that Nepal's practice and experiences is based on the reward based not the polluters pay mechanism in PES. Thus, our vision is towards the positive development of the PES. Invite majority of the local stakeholders' with the PES formulation mechanism. Following are the some examples of forward looking vision for the PES:

1. Review and development of supporting policies is a must in case of the protected area PES mechanism (Joshi, L., 2011)
2. Public awareness is another important work in building greater support in PES
3. Developing a fair and equitable mechanism of revenue sharing in a multi-stakeholders consultation process (Steven De Gryze et.al., 2009) provides sustainability through transparency in PES. It has been already started for the Forest Carbon through Climate Change and REDD Cell under the MoFSC.
4. Exploring the existing major ecosystem approaches in the mountain forests and identify the benefits and their buyers, and getting payment of ecosystem services (INSA, 2006)
5. Environmental benefits also need to be identified, valued properly to support the decision makers (Bryan, 2009) i.e. buyers and sellers, thus, the watershed managers will initiate to conserve their watershed from the upstream.

Conclusion

As obligation created through the international conventions for the signing party, Nepalese rules, regulations and guidelines have provided the right and adequate direction to follow PES. The existing rules and regulations are not directly related to adopt the PES system in the conservation issues because of fear of possible obstacles from the people on their right on access and control over resources as a gift of the nature. On the other hand, some national and international circumstances have created adequate level of awareness and readiness for the use and importance of scarce resources on behalf of livelihoods support of local communities and global ecological balance. In this conflicting situation it has ultimately paved the road for PES mechanism on the ground. In nutshell, existing policies, rules and regulations of Nepal are supporting grounds for the PES; and we have very little time to actualize it in practice. Let us follow the aphorism "be hurry, but work slowly".

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INTEGRATING 'PAYMENT FOR ENVIRONMENTAL SERVICE' (PES) IN MOUNTAIN FOREST ECOSYSTEM MANAGEMENT IN SRI LANKA

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Summary

In Sri Lanka, mountain forest ecosystems deliver a vast range of environmental services in a fair measure to all the people in country. They provide both tangible and non tangible benefits by conserving soil, water, biodiversity and have high recreational values. Most importantly, these forests play a big role as watersheds that feed major rivers in the country. Therefore, they contribute to national production of the country through the hydro power generation, agriculture, inland fish production and ecotourism. In addition to that, mountain forests also act as filters that reduce the water purification costs of the drinking water. Sri Lankan government has accorded great importance to the conservation of these forest ecosystems and sustainable use of lands in hilly areas of the country. Accordingly policy decisions are taken to conserve and encourage the sustainable use of the forests and other ecosystems in mountain region. However, there is no proper valuation of these environmental services and mechanisms are yet to be established for payment towards these services. At a national level, it is required to develop mechanisms and guidelines to pay the communities and the conservation agencies and other groups who contribute to conserve and sustainably manage these priceless mountain ecosystems.

Background

Forest Cover in Sri Lanka

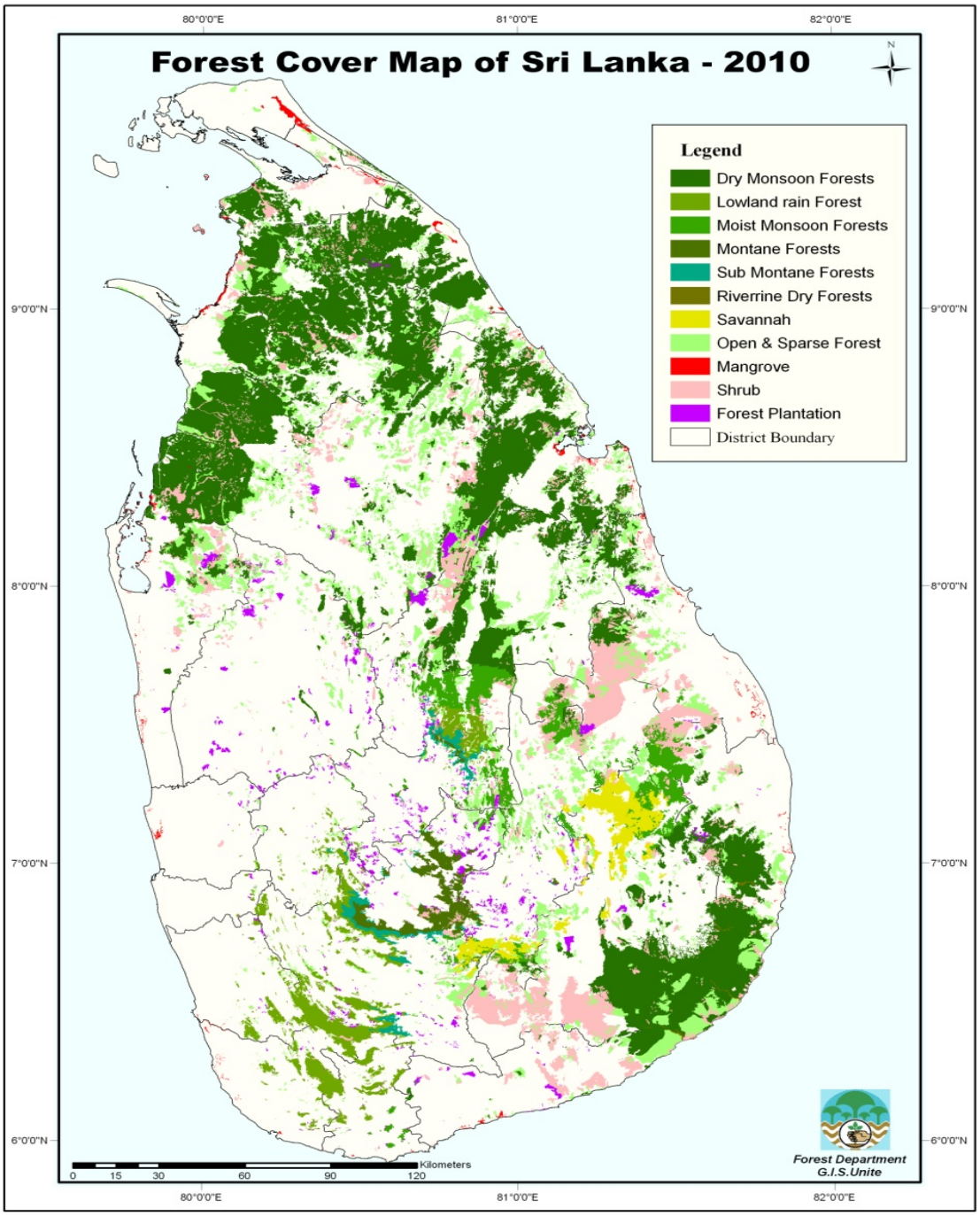
The total natural forest cover in Sri Lanka is estimated as 1,951,472 hectares, which is 29.9% of the total land area in 2010 (Table 1.1). In addition, it has reported nearly 76,560 hectares of forest plantations in the island, which equals to 1.16% of the total land area of the country.

Table 1.1: Extent of Forests in different forests types in 2010.

Forest Type	Extent (ha)	Percentage (%)
Lowland Rain Forests	123,302	1.9
Moist Monsoon Forests	117,885	1.8
Dry Monsoon Forests	1,121,392	17.2
Montane Forests	44,758	0.7
Sub Montane Forests	28,513	0.4
Riverine Dry Forests	2,425	0.0
Mangrove Forest	15,669	0.2
Savannah Forest	68,043	1.0
Open and Sparse Forest	429,485	6.6
Total	**1,951,472**	**29.9**

(Source: Silviculture and Forest Management Unit, Forest Department, Sri Lanka)

Figure 1.1: Forest Cover Map in Sri Lanka- 2014



Mountain Forests in Sri Lanka

Sri Lanka is a tropical continental origin island, which shares tectonic plates with peninsular India, both formed part of southern Gondwanaland, with separation taking place during the Miocene. The island covers 65,610 square kilometers in area (Sumithraarachchi, 1990). The greater part of the island consists of lowlands extending from the coast to an elevation of around 300m. The rest of area is mountainous, located centrally towards the south in the island. The highest peak is Piduruthalaga (2524 m) in Nuwara Eliya District and some other peaks in central hills are Adam's peak (2243 m), Kirigalpoththa (2395m) and Thotupolakanda (2305 m) (Anon, 1997).

From the different types of ecosystems in the island, montane forests, sub montane forests, wet and dry pathana grasslands and the plantation forests (Eucalyptus sp. and Pine) in mountain areas are identified as important mountain forest ecosystems. Mostly these mountain forests are scattered in the districts of Nuwara Eliya, Badulla, Kandy, Ratnapuara and Matale.

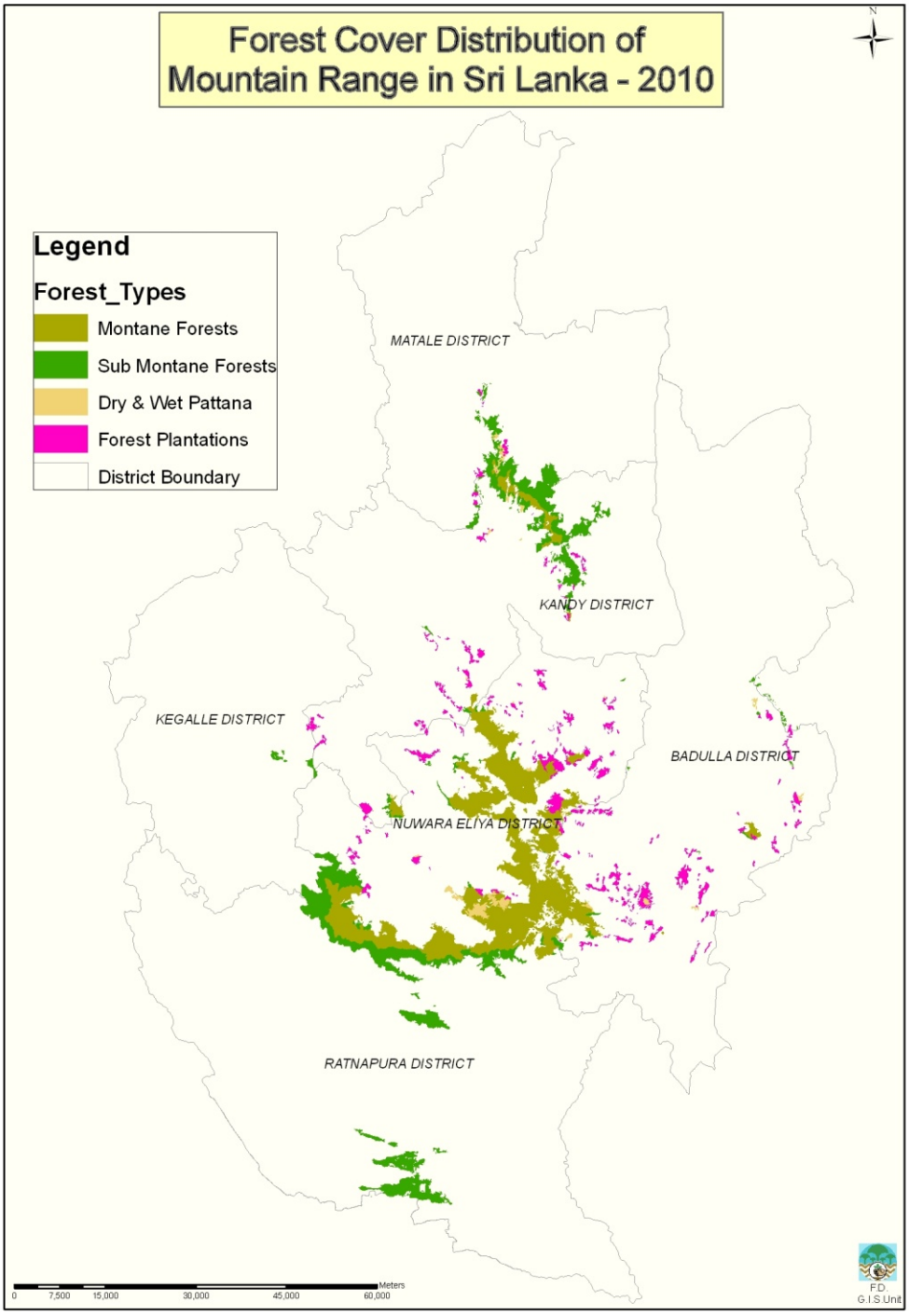
It is reported that 88,450 hectares of mountain forests laid above 1000m elevation of the country belong to the above categories (Table 1.2 and Map 1.1). In addition to that, it has recorded 6,061 hectares of forests (above 1000m) in all categories of mountain forest ecosystems that occurs with less than 40% of canopy cover. These degraded forest lands requires rehabilitation and restoration to deliver their ecosystem functions and services in a sustainable level. Hence, Forest Department has initiated restoration of these degraded mountain forest lands through the hilltop planting programmme.

Table 1.2 Extent of Mountain Forests in Sri Lanka, 2010

Forest Type	Extent (ha)
Montane Forests	44,758
Sub Montane Forests	28,513
Forest Plantation	12,596
Dry & Wet Pathana	2,583
Total	**88,450**

(Source: Silviculture and Forest Management Division, Forest Department, Sri Lanka)

Figure 1.2: Distribution of forests in mountain range, Sri Lanka, 2010



(Source: Silviculture and Forest Management Unit, Forest Department, Sri Lanka)

National Forest Policy Objectives and Management Strategies of Mountain Ecosystems

National Forest Policy objectives in Sri Lanka are:

- conserve forests for posterity for biodiversity, soils, water, and historical, cultural and aesthetic values,
- increase the tree cover and productivity of the forests to meet the needs of present and future generations for forest products and services and
- enhancement of the contribution of forestry to welfare of rural population and to strengthen the national economy to equity in economic development.

To achieve these main objectives, the 1995 Forestry Sector Master plan identified 13 development programmes for the forestry sector of Sri Lanka. Conservation of biodiversity in forests, soil and water conservation and establishment of forest plantations are some of the main points identified under the 13 development programmes.

Mountain forests play a crucial role in biodiversity, soil and water conservation due to the high rainfall and the elevation gradients in their localities. Considering the importance of conserving these valuable ecosystems, most of natural forest ecosystems are protected as conservation forests, reserves or as sanctuaries under the Forest Ordinance or Flora and Fauna Protection Ordinance. Knuckels conservation forest, Peak wilderness sanctuary, Hakgala strict nature reserve, Horton plain national park, Kikiliyamana, Ohiya Man and biosphere reserves are some of protected areas under the above acts.

Conservation of manmade ecosystems like forest plantations and private owned lands is also recognized as important in the prevention of natural disasters in these areas. Hence, the Sri Lankan Government has taken the policy decision in 1990 to ban the harvesting of natural forests and the harvesting of forest plantations in areas with elevation more than 5000 feet. Besides this, the clearing of lands with more than 30^0 slope is also prohibited by the soil conservation act. All these measures have been taken to protect and conserve the mountain forest ecosystems and enhance the sustainable use of lands due to invaluable services provided by the mountain ecosystems.

Ecological restoration is being regarded as a major strategy for increasing the provision of ecosystem services as well as reversing biodiversity losses (Bullock J.M. *et al*, 2011). Forest department, Sri Lanka recognized the importance of rehabilitation of degraded forest lands in the mountain areas especially due to its services in maintaining downstream water flow and the infiltration capacity aided by the trees in the hilltops. Degradation of these ecosystems causes inadequate water to agriculture, inland fisheries production, hydropower electricity and the drinking water supply, which will affect the gross national productivity of the country. Therefore, initiation of forestry programmes to establish the vegetation cover in hilltops protects the watershed and reduces soil erosion in these areas.

Accordingly in 2010, the Forest department, Sri Lanka initiated the restoration of identified degraded forests lands in the mountains region that covers Badulla, Nuwara Eliya, Kandy, Ratnapura and Kegalle districts. Reforestation of hill tops planned to increase the forests in hilltops, assist the natural regeneration in hilly areas, prevent forest fires in montane forests and also to get the stake holders' participation in montane forest management and protection.

From 2010, it has established a total of 702 hectares of degraded forests in hilltops at a cost of nearly 64,000,000.00 Sri Lankan rupees.

Table 1.3: Hill top reforestation; 2010-2013

Year	District	No of Hectares	Total Expenditure (SL Rs)
2010	Nuwara Eliya Badulla	18.5 20.0	1,999,449.00
2011	Nuwara Eliya Badulla	5.5 26	22,999,992.00
2012	Nuwara Eliya Badulla Kandy Ratnapura Kegalle	120 151 20 20 10	22,999,991.86
2013	Nuwara Eliya Badulla Kandy Ratnapura Kegalle	120 151 20 10 10	16,000,000.00

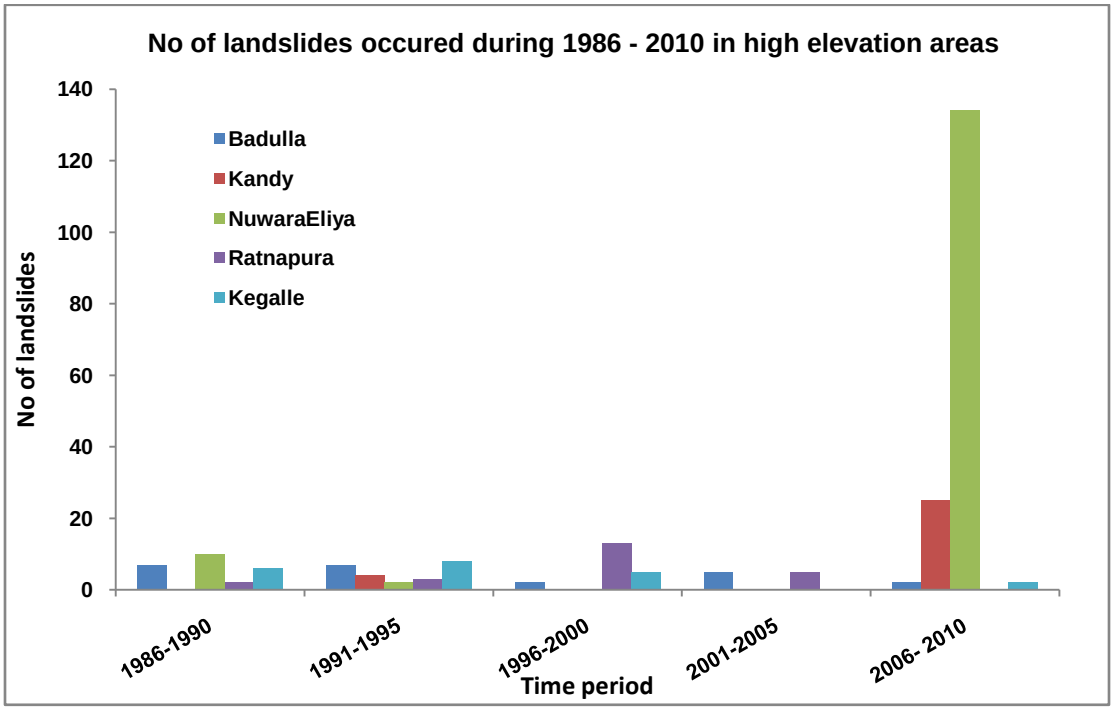
Source: Silviculture and Forest Management Unit, Forest Department, Sri Lanka

In 2014, it is planned to establish 75 hectares of hilltop planting and the estimated expenditure is 6,100,000 Sri Lankan rupees. In addition to the targeted hill top planting in each year, it has allocated money for the maintenance of previous planting areas up to 3 years to assure the survival of their growth.

An increasing trend of converting forested lands for various settlements and agriculture (tea, potato and vegetable) is noticed in up country due to the population expansion. Clearing and disturbance of soil due to tillage and land preparation practices in the hilly areas in up country causes natural disasters like landslides, earth slips etc. An increasing trend of landslides, earth slips and mass movement events during the previous years have been noticed (Figure 1.3).

Until very recently, cardamom cultivation was practiced in the knuckles mountain region, which affected the biodiversity, soil erosion and the natural regeneration of forests. Such uncoordinated and improper planned land use practices could lead to extinction of flora and fauna and natural hazards in high altitudes (Bharathie S., 1990). Hence, considering the conservation of the forest, the Forest Department banned cardamom cultivation in the knuckles region. There is however still some attempts to illegally cultivate cardamom by the nearby communities.

Figure 1.3: No of landslides occurred during 1986 -2010 in high elevation areas



Source: NBRO, Sri Lanka

Human induced forest fires are another main problem in the protection of both forest plantations and natural forests in the mountain areas. It is observed that there are more fire events in plantation forests that consisted pine and eucalyptus than the forests consisting natural species. It is also observed that the negative impacts due to illegal extraction of timber and other forest products as well as the uncoordinated tourism in these areas acted as threats to the conservation of these forest ecosystems.

Considering the human induced causes in forest degradation and deforestation, Forest department has focused in having the collaboration of the nearby communities in the forest protection and conservation activities. Currently, it is implementing community forestry programs in Badulla district, which includes establishment of buffer zones areas surrounding the conservation forests and forest reserves. In this exercise, it is expected to reduce the pressure on existing forests and increase the tree cover outside of forests while providing non wood forest products such as fruits, poles etc. to the nearby communities for their daily consumption.

Also, the tree planting in home gardens, public places and having the participation of private sector in forest conservation and tree planting is encouraged to reduce the pressure in existing protected network. On the other hand, the forest department is practicing a reward payment system to the officers and the other parties for their active involvement in the forest protection activities.

In addition to the actions initiated to conserve the protected areas, there are some other regulations initiated in the country to protect the other land use systems in areas outside of the protected areas. National Environment Act (1980) is implemented to regulate the land uses and practices outside of the conservation areas. Agricultural department and the Livestock

department have introduced incentive schemes practiced to promote the proper agricultural land uses in the up country.

Environmental Services of Mountain Ecosystems

Mountain forests play a big role in the management of watersheds for the rivers like Mahaweli ganga, Kalani ganga, Kalu ganga, Ginganga, Nilwala ganga and Kiridi Oya (Figure 1.4 and 1.5 – Stream Network and River basins in Sri Lanka) and other water bodies that provides water to the main reservoirs of the country. According to the National Conservation review on the island in 1997, 9 of 13 forests in Nuwara Eliya district fall within the 25 most important forests for the headwaters protection. Besides a single exception in Badulla and Kandy districts, all forests in Nuwara Eliya, Kandy and Badulla districts (mountain forests) were laid within 100 most important forests as watersheds. This clearly indicated the importance of protection of forests in mountain region for the protecting of headwaters of main rivers of the country.

Large proportion of the electricity demand and the irrigation requirements of the country are achieved through the function of these reservoirs. Vast numbers of farmers are depending on the water supplied from the irrigation schemes that relies on mountain forests ecosystems. It has been estimated that 582,463 hectares of paddy lands were cultivated under the large scale irrigation schemes and the minor irrigation schemes provided water to cultivate 241,718 hectares of paddy lands in 2012. In 2011- 2012, 789,428 hectares of paddy was cultivated and 3846 metric tons of rice production was the yield in two seasons of Maha and Yala (Statistics book, 2013).

Hydro power generation in 2013 for the country was 11,954 GWh which relies on the mountain watersheds. Ceylon Electricity Board in Sri Lanka recorded an operation profit of Rs.24.6 billion in 2013 in contrast to an operating loss of Rs 62.1 billion in 2012 and this improvement was mainly driven by the higher utilization of hydro sources for electricity generation during the year (Central Bank of Sri Lanka, 2013).

Mountain ecosystems are rich in biodiversity due to various micro climatic conditions created on these ecosystems due to elevation and rain fall differences.

Forest in hilly areas are capable of binding soil together and thereby reducing most of the natural disasters such as landslides, earth slips and flood events in downstream, which in turn causes siltation of water bodies.

Forests act as high density carbon stores and also play a vital role in the pollination which is essential for the production of wide range of crops (Gunawardena U.A.D.P. and Amarasinghe D., 2013)

The rivers flowing from the mountain areas significantly contributed to the inland fish production in the country. It has reported 68,950 metric tons of aqua culture and inland fish production in 2012 (Statistics book, 2013, pp: 49).

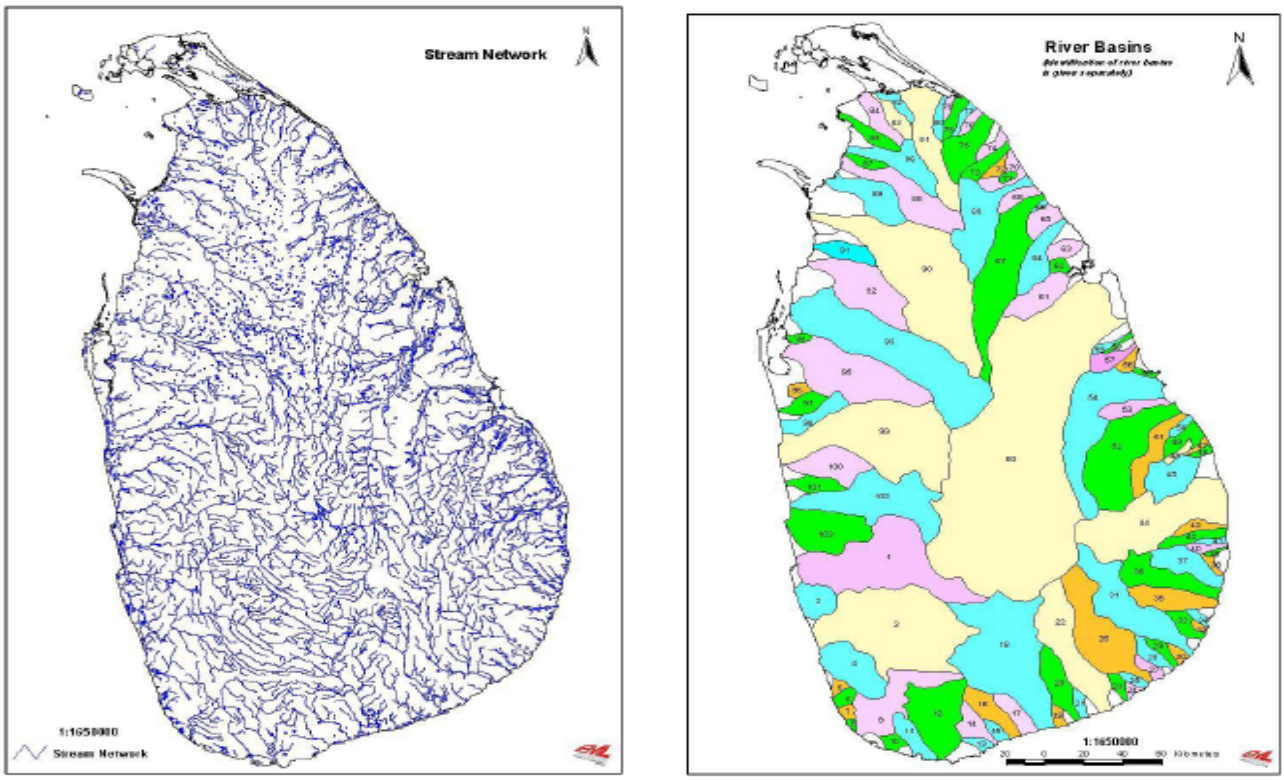
Mountain forests are contributing to enhance the quality of drinking water that reduces the cost of water purification. Benefit of forest cover for replacement of water purification costs may be in the range of US $ 50 -150 per hectare of forest (Holmes T.P. ,1988 cited in Ranasinghe T., Bambaradeniya C. and Ellawala N., 2013).

Mountain ecosystems are highly attractive and have vast potential in ecotourism benefits. Other than the attractive forest views in hilly areas, eye catching waterfalls such as Diyaluma,

Lakshapana, Dunhida, Bambarakanda etc. enhance the beauty of the area that attracts the tourists.

The review of Gunawardena U.A.D.P. and Kularatne M.A.T.R. (2005) showed the consumer surplus of different forests and parks in Sri Lanka. Accordingly, Studies carried out on Horton plain strict nature reserve, Udawattekale national Park and Hakkgala Botanical garden using the travel cost method showed 2181.00, 7900000.00 and 228,493,714.00 Sri Lankan rupees of consumer surpluses respectively.

Figure 1.4 and 1.5: Stream Network and River Basins in Sri Lanka



Source: Jayasuriya A.H.M., Kitchener D. and Biradar C.M.(2006)

Positives of Payment for the Services of Mountain Ecosystems

Even though there is a vast range of indirect and non-use benefits obtained from the mountain forest ecosystems, there is no proper mechanism established yet for the payment of the environmental services flowing out of these ecosystems in Sri Lanka.

However, it has initiated the valuation of the different services of forest ecosystems as well as other sustainable land use systems in the country. If it will start the practice of providing some incentives or payments for the forest nearby communities, conservation agencies and the sustainable land use managers it may encourage the people to a greater extent in conserving and sustainable land use in mountain areas. Moreover, the value addition to conservation will be easy in the participation of the public in forest management and conservation activities.

Other hand, paying for the services will lead to efficient use of the water, electricity and minimize the wastage.

Possible Failures of PES

Presently, valuation studies of the mountain ecosystems services and functions are very scarce and the cost - benefit analyses of restoration projects were not carried out. It has not predicted the success of restoration project and the enhancement of ecosystems services versus the restoration costs.

Also, the benefits obtained from the society due to management of these ecosystems has not been examined in detail and it is difficult to value the non-tangible and non-use values of the forest ecosystems due to limited number of ecological processes that relate almost exclusively to resource utilization.

Poor knowledge of public, policy makers and managers in the field of environmental economics and the practice of these techniques will be a crucial factor in hindering the planning and implementation of these payment mechanisms.

Insufficient staff, resources and lack of knowledge of the officers are other main constraints in implementing payments for the ecosystems services.

Way Forward

Since water is becoming as a very important factor in the world, it has a great potential in using the concept of Payment for Environmental Services in the management and conservation of mountain forest ecosystems. It could ensure the maintenance of this service that provides high quality and quantity of water. Deforestation and degradation of mountain forests and unsustainable land uses in the hilly country will affect the most important sectors in the country such as hydro power generation, agriculture, inland fisheries and drinking water supply etc.
The communities in the hilly areas face limitations in respect of their usable land sizes, land use practices and development due to conservation of these precious forest ecosystems. Not only attempts on conservation activities, agricultural farming systems in these areas have to be managed in a sustainable manner, which could be more costly than the normal practices.

As we discussed earlier, it is clear that the derived benefits of the mountain ecosystems as watershed protection areas. Affects on these forests will lose the income of the sectors of the hydro power generation, inland fisheries, and agriculture and drinking water supply. Usually electricity, water supply agencies earn a considerable profit and they do enjoy lot of benefits. Although there is no return back to save these forests from the profit they gained.

Therefore, in the national level there is a great possibility of using benefit transfer method on valuation of the ecosystem services provided by these forests and other sustainable land use systems. The mechanisms could develop to deliver kind of benefits and facilities to the affected communities, sustainable land uses and the conservation practitioners in hilly areas as incentives by the profit gained agencies from hydro power, fisheries, agriculture industries and the water supply agencies (beneficiaries).

There are sufficient earnings from tourism, which depends on the beauty and values of the mountain forests and landscape in upcountry. Decided proportion of the revenue obtained from the tourism agencies and revenue earned from the conservation forests and parks has to go back directly to the surrounding communities who sacrifice their traditional dependencies for the

protection of the forests and for the conservation managers as incentives or kind of improvement support to their livelihood. This will encourage and bind the staff and villagers to promote their engagement in the forest conservation.

Hence, the payments for the mountain forests ecosystems in the country has to focus first on the charging from the main profit earning industries such as electricity boards and water supply board who get vast profits from these forest services and secondly from tourism sector industries.

In addition to that, forests provide suitable habitats for the pollinators that facilitate the crop production in adjacent agricultural lands. Tea cultivators, potato and vegetable growers in the upcountry disturb the soil and nutrient cycling more than the other land users. Therefore, mechanisms could be develop to compensate the nearby communities of the forests lands who do sustainable land use practices and involve in the forest protection activities and charges should borne through the unsustainable land users and the large scale agricultural land owners who enjoy the benefits gained from forests.

However, the implementation of the payments for the derived services of mountain ecosystems is not possible to do single agency. Therefore, initially it requires the develop a integrated mechanism with the collaboration of Department of Agriculture, Department of Minor Export Crops, Ministry of Plantation , Department of Animal Husbandry and Health, Department of Wildlife and Conservation, Central Environmental Authority etc. Forest Department can act as the agency who verifies the quality and quantity of these services provided by the ecosystems. These mechanisms could be trading of permits among water users, costs of services are included in the price paid for a traded product and environmental taxes and subsidies.

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Presentation by Mr. K.B. Samal, Resource Person for the Meeting

Presentation outline

- Setting the context
- Policy and legislations
- Governing policy
- Strategy
- Institutional set up
- Mandates
- PES and its relevance
- Present status-plans and activities related to PES
- Constraints and opportunities
- Collaboration-national, regional and beyond
- Talking points

Setting the Context

- Watersheds in Bhutan
- Emergence of Integrated watershed management paradigm
- From management to governance

Figure 1: Map showing 186 watersheds in Bhutan classified using the 2010 Guidelines

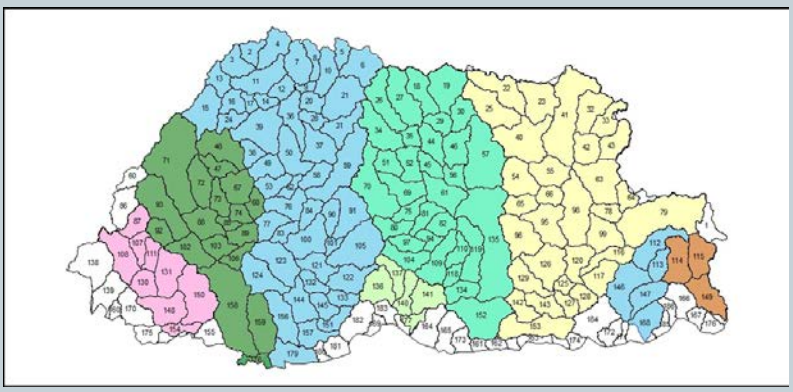


Figure 2: Punatsang Chhu basin location map

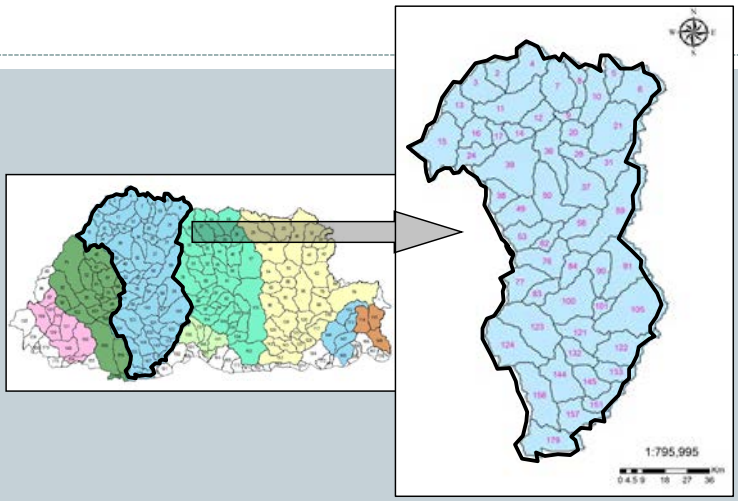


Figure 3: Map of Critical Watershed showing Geogs

Policy and legislation

- The Constitution of Bhutan-Article 5
- The 1974 Forest Policy-Scientific management and commitment to maintain 60% area under forest cover
- Economic Development Policy of Bhutan, 2010-Development of hydro power, promotion of natural resource based industries, nature and eco tourism etc
- Bhutan Water Policy 2003-provides an array of directions in relation to watershed and water resource management in particular
- The Land Act of Bhutan, 2007-Emphasises more collaborate land management planning in relation to Tsamdro and soksing
- National Environment Protection Act 2007- calls for conservation and protection of wetlands, alpine regions, watersheds and other vulnerable eco systems

Policy and legislation...continued

- Environment Assessment Act 2000-lays conditions in issuance of development consent and clearances as environmental safeguards
- Mines and Mineral Act 1995
- The Biodiversity Act of Bhutan 2003-provides for conservation and sustainable use of biological resources
- The Water Act of Bhutan 2011- confers position of competent authority to MoAF for planning and implementing activities to land use and irrigation, watershed management, wetland and water resource management
- Bhutan 2020 vision document-GNH development philosophy

Governing policy

- It can be broadly stated that the National Forest Policy of Bhutan 2011 can be treated as the main governing policy for watershed management and hence ecosystem services that underlines the detailed policy statements to guide the conservation and management of natural resources including forests and water in particular in the form of guiding principles, goals and objectives including the thematic areas to translate the policy into actionable programs and activities. Of particular interest here is the mention of establishing an appropriate institutional arrangement with necessary managerial and technical capacity to implement the policy objectives.

Strategy

- A document captioned "A Road map for Watershed Management in Bhutan" approved by government provides the strategic direction to coordinated and integrated watershed management in order to optimise conservation, social and economic welfare
- As per the strategy document, the approach envisioned is that of integrating watershed management practices with environmentally sound land use management activities and effective community development efforts through comprehensive local institutional movement emphasizing focus on code of best practices

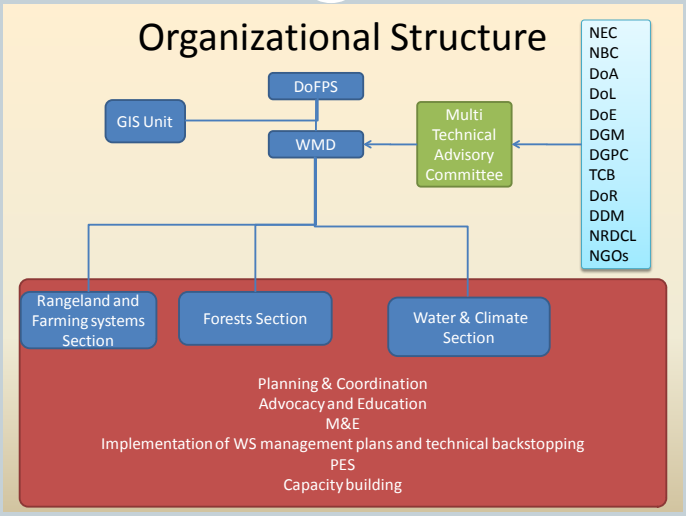
Strategy continued...

- Paradigm of watershed approach
  - ✓ Broad based approach with active and inclusive community participation
  - ✓ Incremental approach to avoid failures that could discourage or distract people
  - ✓ Right mix of top down and bottom up approaches of formal governmental and community based organisations at all levels
  - ✓ Good cooperation between government, private sectors and NGOs assuming joint ownership and responsibilities and establish effective linkages among stake holders at the national, regional and local levels

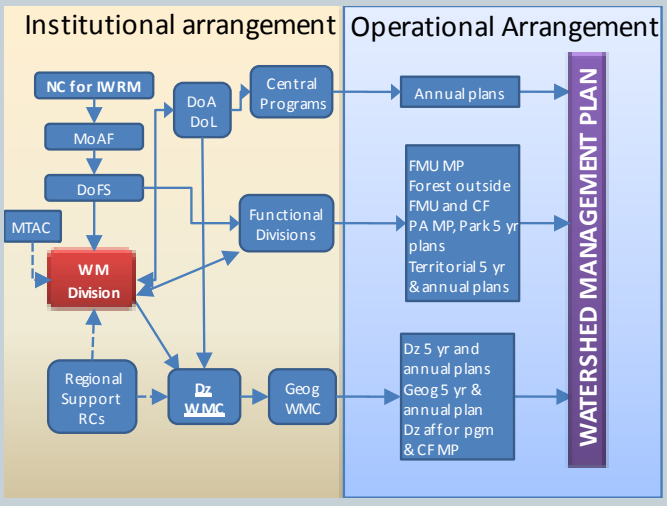
Strategy continued...

- ✓ Emphazise on short term gains and early returns
- ✓ Appropriate technology in terms of reducing uncertainty and ensuring good returns
- ✓ Adequate technical assistance and extension services for transfer of appropriate technology
- ✓ Thorough logistical planning in addition to strategies and interventions
- ✓ Appropriate subsidies and support to reinvestment of gains in community improved programs

Institutional set up



Institutional set up continued...



Mandates

Watershed Management Goals and Objectives

- ✓ To restore, protect and improve watershed conditions through participatory, integrated and adaptive management strategy. This demands to:
- Advance knowledge and understanding of the watershed ecology and best management practices that provide economic benefits while securing natural area productivity
- Rehabilitate watershed land, high altitude range lands, stream channels, wetlands and riparian systems that have become degraded and conserve critical and sensitive ecosystems
- Find common ground and meet multiple needs through focused and coordinated efforts to generate ecologically based, innovative, cost effective solutions and forge stronger working relationships among watershed partners, stake holders and users
- Establish partnership and collaborative watershed institutions at the national and local levels complementing and strengthening each other in supporting national development priorities and addressing unique local concerns

Mandates continued...

- ✓ To support sustainable livelihood including options thereof, and enhance the quality of life of local watershed communities and this entails to:
- Develop, manage and sustain production systems well suited to the existing environment and natural resource base
- Reduce nutrient loads, contaminants in streams and rivers that contribute water for the desired uses
- Carry out activities that help regulate flows in streams and rivers to even off extremes of floods and droughts
- Harmonise the economic uses of natural resources between upstream and down stream areas to secure positive benefits along the watershed continuum and across multiple management objectives
- Explore options for innovative finance mechanism in managing watersheds under bilateral/multilateral funds, government grants, market based arrangements and incentive /reward schemes

Mandates continued...

- ✓ To secure watershed services used to fuel the socioeconomic development of the country. For this to happen, programs and activities need to be pursued to:
- Sustain or increase supplies of high quality water through improved quality and quantity of water in water course and water bodies
- Prevent excessive soil erosion to protect the productive potentials of land and reduce downstream sedimentation
- Take measure to increase ground water storage to restore mountain springs and improve the volume of base flow in natural watercourses

PES and its relevance

- Definition
  -Market based 'pay for performance' approach
  -Wunder's definition evolving and generally accepted
- Concepts and principles
  -Concepts/ingredients
  -Principles
  -Types and scales
  -Actors
  -Configuration and mode of payments
  -Packaging

PES and its relevance continued...

- Strategy to enhance watershed management
  -Need based, transparent and accountable
  -Direct involvement of stake holders
  -Enhance financial prudence and sustainability
  -Introduce market mechanism to finance conservation
  -Empowerment
- Potential ES for PES scheme
  -Hydropower
  -Irrigation and drinking water
  -Biodiversity
  -Scenic beauty
  -Carbon sequestration
  -All provisioning, regulating, cultural and supporting services
- Thinking above the canopy-start dreaming great

Designing and implementation of PES scheme

It follows a planning cycle that can be broadly dealt at five phases:

- Identify the basic ingredients of PES
- Establish applicable concepts and principles and resolve technical issues
- Negotiate and implement agreements
- Monitor, evaluate and review implementation
- Consider opportunities for multiple-benefit PES

Present status-plans, programs and activities related to watershed management and PES

- Development of basin and watershed level management plans in the country
- PES project under implementation with pilot sites and specific environmental service
- PES with potential services being internalised in future watershed projects and programs
- National framework/guidelines being developed to translate PES policy into actionable activities
- Stakeholder analysis and consultations vigorously pursued to take all relevant stakeholders on board to move the PES concept forward
- Action research planned to generate more science based data on environmental amenities to guide policy decisions on PES
- REDD+ program being advocated as an example of PES, CDM and compensatory programs funded by power projects

Constraints and limitations

- A relatively lower priority program
- Requires multidisciplinary intervention and hence more complex at all levels
- Desired institutional arrangement not operationalised
- Multiple land tenure is a constraint
- Inadequate technical capacity
- Integrated and embedded management is still poorly understood
- Watershed science not adequate especially on ecosystem processes

Scopes and opportunities

- Scope of enhancing the watershed services for general benefits
- Can contribute to increased socioeconomic benefits to local communities
- Accrue enhanced goods and services through proper land use
- Critical for conservation of rare fauna, flora and water source

Scope and opportunites continued...

- Development of basin and watershed level integrated plans through collaborative and embedded management approach
- Establishment of national guidelines/frame work for implementation of PES
- Valuation of potential environmental services for PES
- Development of viable PES schemes
- Internalizing PES within watershed plans
- Research on ecosystem services for better management and science based policy decisions
- Graduating from management to governance in planning and implementation of PES schemes

Collaboration-national, regional and beyond

- Relevant government agencies- NLC, NEC, RNR, etc
- National NGOs-RSPN etc
- International NGOs- WWF-Bhutan, IUCN, ICIMOD etc
- International agencies
- Research institutes and academic institutions
- Communities
- Regional cooperation-SAARC etc

Talking Points

- PES as a model in Watershed Governance
- Added significance in the fragile mountain ecosystems
- Step towards economic sustainability
- Consolidating the experiences for forward movement
- Knowledge and gaps in PES scheme in totality
- Start modest and upscale
- Influencing the political discourse and decision

Annexure I

SAARC Expert Group Meeting
6 & 7 August, 2014

INTEGRATING PAYMENT FOR ENVIRONMENTAL SERVICES (PES) IN MOUNTAIN ECOSYSTEM MANAGEMENT IN THE SAARC REGION

Venue: Paro, Bhutan

Questionnaire

1. Are there any ongoing PES schemes in your country? If so, provide brief details of the schemes.

2. If the answer to question no. 1 is yes, what do you think were the factors that contributed to the start of PES schemes? And any key lessons learnt in success/failure of the schemes?

3. Do you see the potential in your country for PES gaining (further) strength in conservation of forests and wild ecosystems? Please elaborate

4. Does PES find place in any conservation policy of your country? If so, please elaborate

5. In which sector/ ecosystem service (like water, watershed management, biodiversity, tourism, carbon sequestration etc) do you see the maximum potential for implementation of PES in the forests and wild ecosystems? Please elaborate

6. What are the challenges that you visualize in increasing the use of PES in your country?

7. What are the steps that you envisage that could be taken to enhance the use of PES in forest and wild ecosystem conservation in your country?

Name of Expert Country Signature