



Proceedings of Nepal country workshop on
**ENVIRONMENTS OF THE POOR IN THE CONTEXT OF
CLIMATE CHANGE AND THE GREEN ECONOMY**

Government of Nepal
National Planning Commission
United Nations Development Programme
United Nations Environment Programme

Kathmandu
July 2011



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Organized by:

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PEI Nepal Brief

The Poverty-Environment Initiative (PEI) in Nepal will support poverty reduction and inclusive development by integrating pro-poor climate and environmental concerns into development planning and economic-decision making. The PEI is not designed as a stand-alone project as such but rather it aims to provide a programmatic framework for targeted support to national and local level planning, budgetary and economic decision making processes through ongoing UNDP supported programmes, in particular, Strengthening Planning and Monitoring Capacity of NPC (SPMC-NPC) and the Local Government Community Development Programme (LGCDP). At the national level, the PEI will help strengthen the NPC's capacity to integrate pro-poor climate and environment concerns in the national planning, budgeting and monitoring processes. Similarly, at the local government level, it will provide technical support to the Ministry of Local Development (MoLD), and select District Development Committees (DDC) and Village Development Committees (VDC) to integrate pro-poor climate and environment priorities into local level planning and budgeting process with a particular focus on rural infrastructure. The proposed timeframe for PEI in Nepal is 35 months from February 2010 to December 2012. The PEI Programme Framework will complement the existing project documents of the above two projects, which will include the stipulated PEI activities in their respective Project Annual Work Plans (AWPs).



FOREWORD

Re-examining the environmental issues and related policies from the perspective of the poor helps in understanding the linkages between them and in identifying the constraints faced by poor people in their day to day lives. With this understanding, the National Planning Commission (NPC) organised a national workshop on "Environments of the Poor in the Context of Climate Change and the Green Economy" to discuss specific research and policy issues. The workshop was supported by the Poverty Environment Initiative (PEI) programme - Strengthening Planning and Monitoring Capacity of National Planning Commission (SPMC-NPC).

National experts and academicians presented papers that reviewed the national programmes and strategies initiated by the Government of Nepal to enhance the environments of the poor in the context of climate change and the green economy. The papers also reviewed the periodic plans of Nepal and the decentralisation process being practiced by the Ministry of Local Development (MoLD).

As the apex body responsible for formulating national development plans, the NPC has always focused on critical developmental issues while preparing them. During the Tenth Plan period, Poverty Reduction Strategy Paper (PRSP) was prepared in order to understand the linkages between poverty and environment. Attempts were also made to examine the conceptual dimensions of environment and poverty. The current Three-Year Plan (2010/11-2012/13) focuses on integrating environmental issues, particularly addressing

environment and climate concerns in development plans and programmes.

Efforts to enhance economic growth in Nepal's fragile mountain topography have their limitations. The rural roads that have been constructed without considering the environmental impacts have started leading to land degradation problems in the hills. What is needed is to protect natural resources while improving the livelihood of the rural poor. Poverty Environment Initiative (PEI) is a timely effort to promote a middle path of development that helps improve livelihood without damaging the environment.

The effort made by SPMC-NPC in bringing out the workshop proceedings is praiseworthy. The recommendations of this national workshop will be helpful in prioritizing poor people's concerns and streamlining investment in boosting a green economy. As a follow-up to this initiative, the NPC has already commissioned a Climate Public Expenditure and Institutional Review Study, which will contribute towards institutionalizing the concept of green economy.

I would like to commend the valuable contributions made by the resource persons, MoLD, UNDP, UNEP, SPMC-NPC project staff and the PEI development partners in making this workshop a fruitful one. I hope that the insights of the workshop would help all development agencies to reflect upon the environments within which the livelihood of the poor hinges, and take the context of climate change and the green economy as directives while preparing development plans and programmes.



Dinesh Chandra Devkota, PhD

Vice Chairman

National Planning Commission

July 2011

ACKNOWLEDGEMENT

The proceedings are the outcome of a one-day country workshop on "Environments of the Poor in the Context of Climate Change and the Green Economy" held in Kathmandu on 18 November 2010.

The workshop had a two-fold objective. Firstly, to make recommendations to the NPC for next Periodic Plan, and to make recommendations to the MoLD to strengthen the decentralization process.

The workshop would not have been possible without the commitment and hard work of many people, particularly the resource persons – Pushpa Lal Shakya, Joint Secretary, Economic Management Division, NPCS and NPD, SPMC-NPC; Ganesh Raj Joshi, Secretary, Ministry of Environment; Batu Krishna Upreti, Joint Secretary and Chief, Climate Change Management Division, Ministry of Environment; Raj Babu Shrestha, Executive Director, PAF; Govinda Koirala, NRM Economist; Som Lal Subedi, Joint Secretary, Local Self-Governance Coordination Division, MoLD and NPD, LGCDP; Narayan Prasad Chaulagain, Executive Director, AEPC; Raju Laudari, Manager, Climate and Carbon Unit, AEPC; Bharat Pokharel, Project Director, NSCFP, SDC; Peter Branney, Programme Advisor, LFP/DFID; Mohan Wagley, PEI Advisor; and Consultant Mukunda Raj Pandeya. Equally important is the support provided by Paul Steele, Advisor, UNDP/APRC, Bangkok, who travelled all the way from Bangkok to Kathmandu to participate in the workshop.

We would like to thank Session Chairs Krishna Gyawali, Secretary, Ministry of Local Development; and Krishna Prasad Acharya, Joint Secretary, Ministry of Physical Planning & Works for chairing the sessions and for their valuable guidance. Our thanks also go to Prof.

Bishwambher Pyakuryal, Prof. Bishwo Nath Tiwari, and Chandra Mani Adhikari, Chairman, CIT, for their constructive comments as lead commentators, and all the participants for their active participation in making the sessions lively through their valuable inputs.

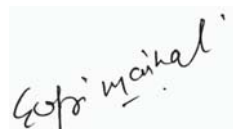
We would like to extend special thanks to Jagadish C. Pokharel, Former Hon'ble Vice Chairman, NPC; Dinesh Chandra Devkota, Hon'ble Member, NPC; Barry J. Hitchcock, Country Director, ADB, Nepal Resident Mission; and Jorn Sorensen, Deputy Country Director–Programme, UNDP-Nepal for encouraging us by addressing the opening and closing sessions of the workshop.

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Irish Aid-Department of Foreign Affairs, Norwegian Ministry of Foreign Affairs, Spanish Ministry of Foreign Affairs and Cooperation, Swedish Environmental Protection Agency, Swedish International Development Cooperation Agency, UK Department for International Development and US Department of State. The support from these organisations is duly acknowledged.



Gopi Nath Mainali
Joint Secretary and Division Chief
Infrastructure Development Division
National Planning Commission Secretariat
July 2011

Last but not the least, we duly acknowledge the technical and logistical services provided by Mukunda Raj Pandeya, Consultant, who not only took the responsibility of organising the country workshop at a very crucial time but also prepared the proceedings. Without his hard work and patience, the proceedings would not have come out in this form. Bhai Kaji Rajbahak prepared the design and layout of the report.

ACRONYMS AND ABBREVIATIONS

ADB	Asian Development Bank	HHs	Households
ADB/N	Agricultural Development Bank/Nepal	HLFFDP	Hills Leasehold Forestry and Forage Development Project
ADDCN	Association of District Development Committees of Nepal	ICIMOD	International Centre for Integrated Mountain Development
AEPC	Alternative Energy Promotion Centre	ICS	Improved Cooking Stoves
AFB	Adaptation Fund Board	IEE	Initial Environment Examination
APRC	Annual Percentage Rate of Change	IGA	Income Generating Activities
B/C	Benefit/Cost	IIDS	Institute for Integrated Development Studies
CD	Clean Development	ILO	International Labour Oragnisation
CDM	Clean Development Mechanism	INGOs	International Non-Governmental Organizations
CF	Community Forestry	IPCC	Intergovernmental Panel on Climate Change
CFUG	Community Forest User Group	IUCN	International Union for Conservation of Nature
CID	Climate-induced Disaster	kW	Kilowatt
CIT	Citizen Investment Trust	LB	Labour Based
CO ₂	Carbon dioxide	LDC	Least Developed Country
COs	Community Organizations	LDCF	Least Developed Countries Fund
DDCs	District Development Committees	LF	Leasehold Forestry
DFID	Department for International Development	LFGs	Leasehold Forestry Groups
DFO	District Forest Office	LFP	Livelihood Forestry Programme
Div.	Division	LGCDP	Local Governance and Community Development Programme
DOLIDAR	Department of Local Infrastructure Development and Agricultural Roads	LHF	Leasehold Forestry
DRR	Disaster Risk Reduction	LSG	Local Self Government
DTMP	District Transport Master Plan	LSGA	Local Self-Governance Act
EB	Equipment Based	LSGR	Local Self-Governance Regulation
EIA	Environment Impact Assessment	MCCICC	Multi-stakeholder Climate Change Initiative Coordination Committee
FAO	Food and Agriculture Organization	MDGs	Millennium Development Goals
FCCC	Framework Convention on Climate Change	Mgmt	Management
FECOFUN	Federation of Community Forest Users Group Nepal	MoE	Ministry of Environment
FGDs	Fundamental Geographic Data Set	MoF	Ministry of Finance
FY	Fiscal Year	MoLD	Ministry of Local Development
GDI	Gender Development Index	MoU	Memorandum of Understanding
GDP	Gross Domestic Product	MTOE	Million Tons of Oil Equivalent
GEF/UNEP	Global Environment Fund/United Nations Environment Programme	MW	Megawatt
GHGs	Greenhouse Gases	NAPA	National Adaptation Programme of Action
GLOF	Glacial Lake Outburst Floods	NAST	Nepal Academy of Science and Technology
GNI	Gross National Income	NCSA	National Capacity Self-Assessment
GoN	Government of Nepal	NDC	National Development Council
GTZ	Technical Cooperation of the Federal Republic of Germany		
HDI	Human Development Indicator		

NGOs	Non-Governmental Organizations	SDC	Swiss Agency for Development and Cooperation
HIN	Hunger Index for Nepal	SDGs	South Asia Development Goals
NIE	National Implementing Entity	SMEs	Small and Medium Enterprises
NLSS	Nepal Living Standard Survey	SNC	Second National Communication
NPC	National Planning Commission	SPMC-NPC	Strengthening Planning and Monitoring Capacity of National Planning Commission
NPCS	National Planning Commission Secretariat	SREP	Scaling Up Renewable Energy in Low Income Countries
NPD	National Programme Director	SWERA	Solar & Wind Energy Resource Assessment in Nepal
NPM	National Project Manager	SWH	Solar Water Heaters
NRM	Natural Resources Management	SWMRMC	Solid Waste Management and Resource Mobilization Project
NSCFP	Nepal Swiss Community Forestry Project	TDMP	Tax Deductible Mortgage Plan
NTFPs	Non-timber Forest products	TU	Tribhuvan University
PAF	Poverty Alleviation Fund	UK	United Kingdom
PEI	Poverty-Environment Initiative	UNDP	United Nations Development Programme
PO	Programme Officer	UNEP	United Nations Environment Programme
PPCR	Pilot Programme on Climate Resilience	UNFCCC	United Nations Framework Convention on Climate Change
PPP	Public Private Partnership	UNICEF	United Nations Children's Fund
PRSP	Poverty Reduction Strategy Paper	US	United States
R&D	Research and Development	USD	United States Dollar
REDD	Reducing Emissions from Deforestation Degradation	VDCs	Village Development Committees
RET	Renewable Energy Technology	WB	World Bank
SAARC	South Asian Association for Regional Cooperation	WWF	World Wildlife Fund
SANDEE	South Asian Network for Development and Environmental Economics		
SC	Solar Cookers		
SD	Solar Dryers		

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PART I

EXECUTIVE SUMMARY

A workshop on "Environments of the Poor in the Context of Climate Change and the Green Economy" was held in Kathmandu on 18 November 2010 under the leadership of the National Planning Commission (NPC) of Nepal. More than 70 participants from the government (NPC, Ministry of Local Development - MoLD, Ministry of Environment - MoE, and Poverty Alleviation Fund - PAF), non-governmental organizations, development partners, the private sector, community organizations and academic institutions attended the workshop. The objectives of the workshop were twofold: to make recommendations to the NPC for next Periodic Plan, and to make recommendations to the MoLD to strengthen the decentralization process.

The workshop was divided into two thematic areas: firstly, Inclusive National Development: Need for Pro-poor Environment and Climate Resilience Policy, and secondly, Local Level Policies and Practices for Pro-poor Development.

There were three presentations in the morning session that focused on national policy framework related to pro-poor environment and green economy. Similarly, in the afternoon session, four presentations that focused on local framework and practices related to pro-poor environment were made.

The workshop highlighted the following key conclusions:

- ◆ There is a clear linkage between poverty and the environment. Degradation of the environment affects the livelihoods of poor women and men who are the most dependent on natural resources. Poor people are also more vulnerable to climate related risks, e.g. floods, landslides and droughts. The environment also affects the health of poor people through indoor air pollution and lack of clean water and sanitation.
- ◆ Both the NPC and MoLD have a key role to play in identifying pro-poor environmental and climate investments in line with the priorities identified in the National Adaptation Programme of Action (NAPA) for climate change document.
- ◆ The NPC and MoLD need to invest carefully in rural infrastructure - carefully combining labour based roads and properly designed heavy equipment based roads. Even though they are more costly in the short run, labour based roads last longer. Also, labour based roads have an internal rate of return that is 30% higher than heavy equipment based roads.
- ◆ Nepal must think carefully about how it extracts its mineral resources to maximise economic benefits and minimise negative social and environmental impacts.

- ◆ Upland poverty requires empowering rural households by combining traditional knowledge with modern science. These households are already facing adversities of changing climate along with other difficulties.
- ◆ Renewable energy already provides 9% of electricity, but these schemes need to be further upscaled.
- ◆ Leasehold and community forests can be pro-poor but require a multi-stakeholder and landscape approach.

Opening Session

Addressing the inaugural session of the workshop, UNDP-Nepal Deputy Country Director Mr. Jorn Sorensen stated that climate change poses a major risk to many development projects and programmes. To maximise growth, both the NPC and MoLD can play a key role by paying more attention to climate change in the planning and budgeting process. The NAPA or National Programme of Action for Climate Change has been developed. But its key recommendations and proposed programmes need to be included in the Periodic Plan and in District Development Plans. He also stressed the importance of environmentally friendly rural roads and the effective use of natural resources, especially minerals.

Vice Chairman of the NPC, Dr. Jagadish Chandra Pokharel, pointed out that Nepal's growth and development path needed to address climate and environment issues. He emphasized the need to take a location-specific approach as the type of poverty and environmental issues varied significantly across the country.

Secretary at the MoLD, Mr. Krishna Gyawali, asserted that the MoLD is serious about address-

ing natural resource and climate issues. The twenty-two districts that are involved in natural resource extraction are now implementing tougher environmental monitoring criteria.

Dr. Dinesh Chandra Devkota, member of the NPC, lay special importance on the need for national climate and environment policies developed by the NPC to be effectively linked with local level actions promoted by the MoLD, and by DDCs and VDCs.

Themes Presented and Discussed

Paper 1

A paper on "Integrating Environment, Poverty and Green Economy into National Planning Process" was firstly presented by Mr. Pushpa Lal Shakya, Joint Secretary, Economic Management Division, NPC, and NPDP, SPMC-NPC; and Mr. Gopi Nath Mainali, Joint Secretary, Infrastructure Development Division, NPC.

Main highlights of the paper are:

The five-year plan is being drafted. Challenges include ownership of the plan due to the failure in consensus-making between the political parties. We are still not able to integrate the South Asia Development Goals (SDGs – 2007-12). The SDGs identify a set of 22 goals of which 8 are related to livelihood, 4 to health, 4 to education, and 6 to environment. We need to attempt to integrate them in the coming plan. Poverty and social marginalisation are closely linked to environmental degradation such as floods, rising temperatures etc, which are the examples of environmental crisis. As such, inclusion of a mitigation mechanism for such environmental hazards is a daunting task.

Study shows that every 1% increase in per capita agricultural output leads to a 1.61% in-

crease in the incomes of the poorest 20%. Biotechnology needs to be applied in agricultural processes. Genetic modification technology has made agriculture competitive – viz., development of virus-free potato seeds, banana etc. There has to be more research in this area. Adoption of Green Technology that reduces environmental damages for economic development activities is one of the key factors for bringing about sustainable development. It requires a lot of investment in R&D in the future.

Paper 2

A paper on "Climate Screening, Adaption Actions, Financing and Policies: Essentials for Improving the Livelihoods of the Poor" was presented by Mr. Batu Krishna Upreti, Joint Secretary and Chief, Climate Change Management Division, MoE.

Main highlights of the paper include:

Institutional development is the key for effective implementation of any programme. Following institutional arrangements have been made for mitigation and adaptation of climate change in Nepal: Nepal is a signatory to UN FCCC, which is already ratified. The Ministry of Environment is the focal agency for UN FCCC. A separate high level Climate Change Council headed by the Rt Hon Prime Minister co-ordinates climate change agenda at the national level. A Climate Change Management Division has been established within MoE as a dedicated constitution to desk on climate change programming and resource mobilization. The National Adaptation Programme of Action is already prepared and launched (November, 2010). Local Adaptation Plan of Action is under preparation and is going to be finalized within a few months to translate the NAPA into priorities at the local level. At least US\$ 350 mil-

lion is urgently needed for taking adaptation actions to climate change to implement priority projects identified under NAPA. The amount available from the donor community, however, is very little.

Some of the challenges and recommendations are:

There is a gross lack of data on the impact of climate change on different sectors. In view of this, it is difficult to make effective planning and monitoring of the programmes on disaster risk reduction and climate change adaptation.

There is a need for implementing the targeted programmes focusing on the poorest of the poor to cope with the negative impact of climate change. Most of the poor are agricultural laborers or small farm holders; the impact of climate change affects both of them. Therefore, separate targeted programmes need to be implemented for the improvement of their livelihoods. Improvement in infrastructure and services to enhance the coping capacity of the disaster prone communities on the one hand and disaster risk reduction on the other are required.

Nepal has negligible carbon emission compared to its neighbors and other developed countries. Nepal has been expanding its protected areas. The benefits of such protection are global whereas its opportunity cost in terms of foregone benefit is local. Therefore, Nepal has to make a strong argument to garner international support for poverty reduction and disaster risk management.. Of all the measures, improving governance is a must. This requires a proper incentive structure. The major problem for the execution of the NAPA is lack of funds.

Paper 3

A paper on "Upland Poverty: Examining Causes, Identifying Solutions" was presented by Mr. Raj Babu Shrestha, Executive Director, Poverty Alleviation Fund.

Main highlights of the paper include:

There is higher incidence of poverty in the mountains and the hills. The visible impacts of climate change seen in mountains and hills include erratic rainfall pattern, depletion of water sources, decrease in winter snow fall leading to less moisture, less availability of fodder and grass in pasture land, and more incidences of landslides. As 80% of the poor depend on agriculture, there is a need to assess the impact of climate change on agriculture to respond to poverty. The poor coping mechanisms need to be complemented by modern science.

Paper 4

A paper on "Economic Analysis of Local Government Investments in Rural Roads: Reducing Poverty through Managing Climate and Environment Risks" was presented by Dr. Govinda Koirala, NRM Economist.

Main highlights of the paper include:

Study shows that rural roads that are constructed using equipment based technology are more vulnerable to landslides and also cause damage to environment. Roads constructed using labour, on the other hand, are "green" roads and are less prone to landslides. It was also found that though the cost of labour based roads is more, they have 30 % higher return compared to equipment based roads. Labour based roads also provide more employment to the poor and are, therefore, always found to be pro-poor and environment friendly.

Some of the challenges and recommendations are:

There is a need to be clear about the approach of rural infrastructure development, including

roads. Additionally, there is a need to specify the sources of fund and its modality of disbursement while developing a road construct project, enforce financial related laws and regulations during implementation, taking care of technical and environmental issues, and initiative for providing technical assistance to and capacity development of local bodies.

The operation and maintenance of rural roads should be considered while planning, designing and constructing them, and rural infrastructures and their significance in livelihood should be included in the curriculum of school education. Alternative options need to be developed for displaced households, communities and groups due to rural road construction through employment, income and land.

Roads should be pro-poor, resource-adequacy based, environment friendly, technically viable, risk free, inclusive, and market friendly. Hence, considering the cost, the environment and pro-poor mechanism, blended technology combining both labour based and equipment based, depending upon the physical condition of the area, should be adopted.

Paper 5

A paper on "Local Government Revenue Raising from Natural Resources: How Better Natural Resource Management can Increase Local Tax Revenues in Nepal" was presented by Mr. Som Lal Subedi, Joint Secretary, Local Self-Governance Coordination Div., MoLD; and NPD, LGCDP.

Main highlights of the paper include:

There are many provisions that provide local governments the opportunity to utilise natural resources and generate revenue for development activities. Since all policies and programmes developed by the central government are implemented at the local level, the local government must be strengthened.

This requires:

There should be clear legal provisions, and effective implementation of existing legal provisions on environmental screening. There is a need for implementing guidelines for sustainable and environment friendly development activities, and for educating human resources available at the local level.

We need to design a revenue policy as per the nature of natural resources considering intergenerational equity while managing the natural resources, and correlating the expenditure functions and revenue generation.

Policy guidelines, procedures and norms need to be developed so as to avoid policy gaps and conflicts in resource extraction, use, revenue generation and sharing. The revenue mobilisation from natural resources should be associated with the overall development of local government. In this regard, the raising of revenue should be considered not only by focusing on harvesting, but also by emphasising revenue generation activities like development of enterprises etc.

Paper 6

A paper on "The Environments of the Poor in the Context of Climate Change and the Green Economy - Alternative Energy Linking Climate and Environment Consideration" was presented by Dr. Narayan Chaulagain, Executive Director, Alternative Energy Promotion Centre (AEPC).

Main highlights of the paper include:

Use of renewable energy is one of the viable options for the mitigation of climate change issue and other environmental problems. However, the use of Renewable Energy Technology is relatively low in relation to the potentiality of resources available in the country. It is less than 20% of all the available capacity of the technology. HDI and per capita energy consumption are directly related. Provisioning of energy services is a proven catalyst for eco-

nomic and social transformation. Hence, Alternative Energy plays a positive role in achieving the MDGs.

Paper 7

A paper on "Community Based Forestry and Climate Change: Implications for Environment and People Living in Poverty in Nepal" was presented by Dr. Bharat Pokharel, Project Director, NSCFP, SDC; and Mr. Peter Branney, Programme Advisor, LFP/DFID.

Main highlights of the paper include:

Community forestry in Nepal has proved to be one of the best policies to protect the forests in Nepal. The policies and practices of Community and Leasehold Forestry are increasingly becoming pro-poor and climate resilient. Study shows that there are visible and measurable impacts of community and leasehold forestry in reducing poverty and the negative effect of climate change.

Some of the challenges and recommendations are:

Both community forestry and leasehold forestry should complement each other rather than compete as rivals; effective monitoring of leasehold forestry is necessary so as to make it an effective pro-poor programme.

Both community forestry and leasehold forestry can regenerate forest resources whose benefits extend beyond Nepal. Therefore, larger grants from other countries are required for climate adaptation in view of Nepal's low carbon emission and the large amount of forest resources generated due to the community and leasehold forestry programmes.

Community and leasehold forestry should serve as poverty reduction programmes. The government should support these two programmes and mobilize communities and their resources for the benefit of the communities as well as the country.

PART II

OVERVIEW

1. INTRODUCTION

Over the past decade, the Asia and Pacific region has shown a rapid decline in income-based poverty as a result of broad-based and largely pro-poor economic growth. In addition, social indicators of poverty in the region as expressed in the Millennium Development Goals (MDGs) have shown substantial improvement.

However, the development path followed by most countries has resulted in a host of negative impacts on the environment. There has been a corresponding increase in the incidence of poverty that can be attributed to environmental causes. While the Asia-Pacific region will continue to make progress in poverty reduction both in terms of income and social dimensions, environmental poverty in the region is likely to increase. It is estimated that by 2020, more than two-thirds of the vulnerable and poor population in the region will suffer from environmental poverty – up from less than one-half today. For the very poor, the environment will increasingly be the main factor for their poverty while environmental causes of poverty are declining for the moderately poor. Aggravated by climate change and migration, rural dry land and urban slum poverty especially are increasing. The "environmental poverty" perspective categorizes poor

people in a manner that demonstrates how environmental conditions affect their wellbeing. Furthermore, adapting to climate change and policies to make "green" growth are also pro-poor and pose additional challenges for promoting inclusive development.

Nepal is currently preparing its Periodic Plan which will give greater attention to climate and environment issues for poverty reduction and inclusive growth. In addition, the decentralization process, which is providing larger funds for local governments to spend at the local level, is leading to both opportunities and challenges in terms of natural resource management and adapting to climate change. In this context, it is also useful to carefully examine how successful government and non-government interventions that seek to offer solutions to both poverty reduction and environmental change have been.

To address these issues of the environment and climate at the national and local levels, development partners (UNDP/UNEP, ADB, ILO, SANDEE) and other government and non-governmental agencies were involved in a national workshop on Understanding the Environments of the Poor: Responding to Climate Change and the Green Economy. This has contributed to a regional conference that is being planned in Delhi from 24-26 November 2010.

The Nepal Country workshop on "Environments of the Poor in the Context of Climate Change and the Green Economy" was held in Kathmandu on 18 November 2010. The participants of the Nepal Country workshop were a core team/panel of representatives from the government, selected non-governmental organizations, development partners, the private sector, community organizations and academic institutions.

The National Planning Commission (NPC) took the lead role in organizing this national workshop with the support of UNDP/UNEP under PEI. The workshop discussed country-specific research and policy papers prepared for the Delhi conference as well as other relevant papers on "the environments of the poor". The country workshop was intended to discuss country programs and strategies initiated to enhance the environments of the poor in the context of climate change and the green economy, including the "Periodic Plan" and the decentralisation process being practiced by the NPC and the Ministry of Local Development respectively.

2. OBJECTIVES

The country workshop discussions revolved around new research findings and country policy and programmes relevant for the environments of the poor in the context of climate change, green growth, and building resilience against natural hazards. Contemporary issues faced by the poor with regard to development were highlighted and recommendations were also suggested for policy measures in the national and local context.

The NPC is currently leading the process of developing the next periodic plan and so the outcome of the workshop would be to provide inputs in adopting poverty and climate responsive strategies and programmes. Appropriate

action in the context of climate change and green economy that show the way forward for policy makers in the coming years is the need of the day.

As part of the country experience, the outcome (issues and recommendations) of the workshop will be shared during the regional workshop to be held in Delhi from 24-26 November 2010.

3. PARTICIPANTS

More than seventy participants attended the workshop. They represented various ministries working on the interface between poverty reduction, climate and environmental issues. These included the NPC, Ministry of Local Development, Ministry of Environment, Ministry of Forest and Soil Conservation, Ministry of Energy, Ministry of Foreign Affairs.

Participants also included those from specialized government agencies like Poverty Alleviation Fund, Natural Resource and Conservation Committee, National Trust for Nature Conservation, National Academy of Science and Technology, DOLIDAR, Solid Waste Management, LGCDP/MoLD, AEPC and ADDCN. Also taking part were representatives from development partner organizations, academia, think tank organizations, community organizations and the private sector. Donor communities who participated in the national workshop were UNDP, World Bank, ADB, ILO, LFP, DFID, SDC, GTZ, and REDD. Representatives including those from academic and research institutions from Tribhuvan University and Kathmandu University, the SAARC Secretariat, ICIMOD, WWF, IUCN, and WINROCK were also invited. Other INGOs and NGOs that were invited to share their experiences in the relevant subject included CARE Nepal, IIDS, SANDEE, FECOFUN and Practical Action. The list of participants is given in Appendix I.

4. INAUGURATION PROGRAMME

The opening session of the programme was chaired by Dr. Dinesh Chandra Devkota, Hon'ble Member of the NPC.

Mr. Gopi Nath Mainali, Joint Secretary of the NPC, first welcomed all the guests and participants and also highlighted the objective of the workshop.

Speaking at the inaugural session, Mr. Krishna Gyawali, Secretary of the Ministry of Local Development, stated that as a developing country, Nepal needs to utilize natural resources for the economic wellbeing of its people. Though the effect of climate change is global, the adaptation and mitigation of its effects needs local action. Hence, all activities need to be localized. He emphasized that there is a need for environment friendly development activities at the central as well as local levels. For this, educating, listening to and facilitating local bodies is required.

He added that the issues are related to the performance and/or non-performance of the local bodies. For this, decentralization of service delivery at the local level is needed. This requires:

- ◆ Clearly stipulated mandate, i.e. popularly elected local bodies or alternative arrangement, in our special case, for popular representation
- ◆ Clear legal provision
- ◆ Guidelines for sustainable and environment friendly development activities
- ◆ Educating human resources available at the local level

He further added that the major concern of today is the utilization of natural resources without considering the environment at the local level. About 22 out of the 75 districts are heavily involved in the use of natural resources. He also assured that the MoLD is going to make

mandatory arrangement for adopting IEE and EIA for these districts within a couple of months. Now, all contracts related to utilization of natural resources would be awarded on the basis of IEE and EIA, he said.

Mr. Jorn Sorensen, Deputy Country Director, UNDP-Nepal, also gave his remarks at the opening ceremony. He mainly highlighted the objectives of the workshop and raised the issue of river erosion, food security, risk of climate change and man made disaster. He said that climate change poses a major risk to many development projects and programmes. To maximise growth, both the NPC and MOLD can play a key role by paying more attention to climate change in the planning and budgeting process. The NAPA or national plan of action for climate change has been developed, but its key recommendations and proposed programmes need to be included in the Periodic Plan and District Development Plans.

He emphasized that there is over utilization of natural resources due to under pricing. He suggested that social cost be considered while utilizing natural resources. He also suggested that there has to be inter-generational equity.

In his keynote address, Dr. Jagadish Chandra Pokharel, Hon'ble Vice Chairman of the NPC, stated that during the tenth plan period PRSP was initiated and the initiation was made to link poverty with environment. He said that an attempt was also made to understand the dimensions of environment and poverty conceptually. He added that the new plan emphasizes the NAPA. The main focus of the new plan will be on the new dimensions of poverty, i.e. minimum requirement for decent living.

He pointed out that there is a problem of physical services (water, sanitation etc.) faced by the poor. Growth dependent on natural resource extraction may result in increased dependency on natural resources. This may lead to an in-

crease in road networks without government notice. And such roads that will be constructed without considering the environmental impacts may result in environmental hazards. He further added that the tools used for Environmental Impact Assessment should be re-sharpened and reframed legally so that they may cover broader dimensions.

In his concluding remarks from the chair, Dr. Dinesh C. Devkota raised issues like protection of biodiversity and livelihood of the rural poor, and made the following suggestions:

- ◆ Conduct development activities and protect the environment
- ◆ Preserve the resources and fulfill the requirement of the stakeholders
- ◆ Reduce poverty and climate change adaptation and mitigation measures

He stated that there is a need for developing a mechanism in the current planning process and macro-economic framework for incorporating these agendas.

Following this, Mr. Atma Ram Pandey, Officiating Secretary of the NPC, delivered the vote of thanks.

Closing Session

At the end, a closing session was held. The session was chaired by Mr. Krishna Gyawali, Secretary, Ministry of Local Development.

Mr. Barry J. Hitchcock, Nepal Residence Mission Office, Country Director, Asian Development Bank, gave the closing remarks. In his remarks, Mr. Hitchcock highlighted that in the approach paper of the coming plan, the issue of climate change is addressed properly. He further added that the ADB is in the process of helping prepare a joint mission with the government and multilateral banks for the preparation of pilot projects for mitigation plans and

also for global climate change negotiations. He emphasized that many things are to be done on climate change related disaster. Lastly, he gave assurance that the bank is ready to address poverty reduction activities and environmental sustainability in all projects and programmes as a development partner.

Mr. Krishna Gyawali, in his remarks from the chair of the closing session, pointed out that the workshop could not have been organized at a better time. He said that Nepal has just prepared the NAPA and that the discussion in the workshop would be on the right issues and at right time. The papers that would be presented, he said, have raised many issues, and some of them are related to the Ministry of Local Development. He assured that the harmful activities within the purview of local government would be controlled within a few months by implementing IEE and EIA in all activities related to natural resource utilization. Finally, he thanked all the participants before declaring the session closed.

5. METHODOLOGY ADOPTED FOR CONDUCTING THE COUNTRY WORKSHOP

Workshop Structure

The workshop was divided into two thematic areas: firstly, Inclusive National Development: Need for Pro-poor Environment and Climate Resilience Policy, and secondly, Local Level Policies and Practices for Pro-poor Development. The Programme Schedule is given in Appendix II.

There were three presentations in the morning session that focused on national policy framework related to pro-poor environment and green economy. The papers were critically examined by an expert to filter what could be

really used for future course of actions under PEI in Nepal as well as what could be taken as feedback to the Delhi Conference. After the expert gave his comments on the presentations, the floor was opened for plenary discussion. The session was then wrapped up by the Chair.

Similarly, in the afternoon session, four presentations that focused on local framework and practices related to pro-poor environment were made. The papers were then scrutinized and critically examined by an expert. This was followed by plenary discussion and then the session was finally wrapped up by the Chair.

Resource persons providing inputs for the country workshop were national and international experts. All presentations were made by national experts. The theme papers and resource persons were as follows.

Morning Session Theme

Inclusive National Development: Need for Pro-poor Environment and Climate Resilience Policy

- 1) Integrating Environment, Poverty and Green Economy into National Planning Process – Mr. Pushpa Lal Shakya, Joint Secretary, Economic Management Division, NPCS, and NPD, SPMC-NPC; and Mr. Gopi Nath Mainali, Joint Secretary, Infrastructure Development Division, NPCS
- 2) Recommended Climate Policies and Investments from the National Adaptation Programme of Action and Climate Screening from Investment Projects with focus on Safeguarding Pro-poor's Livelihood – Dr. Ganesh Raj Joshi, Secretary, Ministry of Environment; and Mr. Batu Krishna Upreti, Joint Secretary and Chief, Climate Change Mgmt. Div., Ministry of Environment
- 3) Upland Poverty: Examining Causes, Identifying Solutions – Mr. Raj Babu Shrestha, Executive Director, Poverty Alleviation Fund

Afternoon Session Theme

Local Level Policies and Practices for Pro-poor Development

- 4) Local Government Expenditure and Rural Roads: Economics of Reducing Poverty while Managing Climate and Environment Risks - Dr. Govinda Koirala, NRM Economist
- 5) Local Government Revenue Raising from Natural Resources: How Better Natural Resource Management Can Increase Local Tax Revenues - Mr. Som Lal Subedi, Joint Secretary, Local Self-Governance Coordination Div., MoLD, and NPD, LGCDP
- 6) Alternative Energy Linking Climate and Environment Consideration: Implication on the Improved Livelihood of the Poor - Dr. Narayan Chaulagain, Executive Director, Alternative Energy Promotion Centre (AEPC)
- 7) Leasehold Forestry and Community Forestry: Implications for the Poor, Environment and Climate Change - Dr. Bharat Pokharel, Project Director, NSCFP, SDC; and Mr. Peter Branney, Programme Advisor, LFP/DFID

6. MORNING SESSION AND PRESENTATION BY EXPERTS

The morning session started at 10:30 hrs. The session was chaired by Mr. Krishna Prasad Acharya, Joint Secretary at the Ministry of Physical Planning & Works. Three papers were presented during this session.

The first paper titled Integrating Environment, Poverty and Green Economy into National Planning Process was presented by Mr. Pushpa Lal Shakya, Joint Secretary, Economic Management Division of NPCS. Mr. Shakya stated that the planning process mostly tries to address development concerns. While considering de-

velopment activities, IEE and EIA processes are mandatory so as to achieve sustainable development. He showed that there is a clear linkage between poverty and environment. If there is degradation of the environment, it creates problems for the livelihoods of poor people who depend on natural resources. The poor people are more vulnerable due to environmental risks, e.g. floods and droughts. He emphasized that the current plan is trying to incorporate measures to address such issues.

He also emphasized in the paper that there are problems of indoor air pollution, lack of clean water and sanitation, and decrease in water and biomass as well. The planning process needs to develop environment friendly programmes such as:

- ◆ Sustainable small-scale natural resource based industries.
- ◆ Public works programmes for natural resource management
- ◆ Redesigned programmes that take account of climate risks
- ◆ Labor based environment friendly roads
- ◆ Public works programmes that promote natural resources

He also suggested that more investment is required in environment related issues like environmental health and better natural resource management.

The full text of the paper is given in Paper Presented I.

The next presentation by Mr. Batu Krishna Upreti, Joint Secretary, Ministry of Environment, was on Recommended Climate Policies and Investments from the National Adaptation Programme of Action and Climate Screening from Investment Projects with a focus on Safeguarding the Livelihood of the Poor. Mr. Upreti highlighted the institutional arrangements made so far for the mitigation and adaptation of climate change in Nepal. He added that

Nepal is a signatory party of the FCCC and that it is ratified. A separate Ministry of Environment is established, and that there is a separate Climate Change Council headed by the Vice Chairman of NPC. There also is a Climate Change Management Division within the Ministry of Environment. Further, the National Adaptation Programme of Action (NAPA) has already been prepared and launched since 4 November, 2010. The Local Adaptation Plan of Action (LAPA) to translate the NAPA into action is under preparation and is going to be finalized within a few months. He pointed out that there is a need for at least US\$ 350 million urgently for adaptation to climate change as per the NAPA. The funding available from the donor community, however, is very low, he said.

The full text of the paper is given in Paper Presented II.

The third paper presented in the morning session was by Mr. Raj Babu Shrestha, Executive Director, Poverty Alleviation Fund (PAF). The topic of the paper was Upland Poverty: Examining Causes, Identifying solutions. In his presentation, Mr. Shrestha pointed out that the incidence of poverty is higher in the mountains and hills. He said that visible impacts of climate change are being seen in the mountains and hills. These include the following:

- ◆ Erratic rainfall pattern
- ◆ Depletion of water sources
- ◆ Decrease in winter snow fall resulting in less moisture
- ◆ Less availability of fodder and grass in pasture land
- ◆ More incidences of landslides.

He suggested the following adaptation and mitigation measures:

- ◆ Short term relief projects
- ◆ Increased investment in priority sectors
- ◆ Diversification of crops
- ◆ Blend of traditional practices with modern science for improving knowledge

- ◆ Empowerment of local communities on information technology
 - ◆ Different action research for different localities as the impact of climate change is different depending upon the locality
 - ◆ More focus on infrastructure development in the mountains and hills
 - ◆ Focus on pro-poor programmes
 - ◆ Focus on community centered initiatives and empowerment of community level institutions
 - ◆ Education and empowerment of deprived groups
 - ◆ Emphasis on and encouragement of PPP
 - ◆ Development of a mechanism for rewarding the services provided by mountain communities
 - ◆ Balancing and improving the linkage between the plain, hills and mountains.
- The full text of the paper is given in Paper Presented III.
- ◆ Poverty and social marginalization are closely linked to environmental degradation - floods, rising temperatures etc. are the examples of environmental crisis. Inclusion of mitigation mechanism for such environmental hazards is therefore a daunting task.
 - ◆ Study shows that every 1% increase in per capita agricultural output leads to a 1.61% increase in the incomes of the poorest 20%. Bio-technology needs to be applied in agricultural processes. A genetic modification of micro-organisms through bio-technology has made agriculture competitive - viz., development of virus-free potato seeds, banana etc. There has to be much more research in this area.
 - ◆ Adoption of Green Technology that reduces environmental damages for economic development activities is a key to sustainable development. It requires a lot of investment in R&D in the future.

The Lead Commentators, Prof. Bishwambher Pyakuryal and Prof. Bishwo Nath Tiwari, gave their comments on each of the presentations. While Prof. Pyakuryal commented on the papers presented by Mr. Pushpa Lal Shakya and Mr. Raj Babu Shrestha, Prof. Tiwari commented on that presented by Mr. Batu Krishna Upreti.

Prof. Pyakuryal raised the following points:

- ◆ There is a problem of ownership of the plan document due to the failure in consensus-making between political parties. When political interests converge, economic plans survive; but when political interests diverge, economic policy making is completely stalled.
- ◆ Nepal still has not been able to integrate the South Asia Development Goals (SDGs, 2007-12). The SDGs identify a set of twenty-two goals. Of these, 8 are related to livelihood, 4 to health, 4 to education and 6 to environment. There is a need to make efforts to integrate them in the coming plan.

Prof. Pyakuryal's detailed comments are given in Comment I.

Commenting on the paper presented by Mr. Upreti, Prof. Bishwo Nath Tiwari pointed out that there is a gross lack of data on the impact of climate change as well as the impact of disaster risk. In view of this, it is difficult to effectively plan and monitor the programmes on disaster risk reduction, mitigation or climate change adaptation. Therefore, it is desirable to collect regular data on disasters risks and their impacts.

He further emphasized the need for implementing the targeted programmes focusing on the extreme poor so that they can cope with the negative impact of climate change. Most of the poor are agricultural laborers or small peasant holders; the impact of climate change affects both of them. Therefore, separate targeted programmes should be implemented for the improvement of their liveli-

hoods. He also pointed out that Nepal has negligible carbon emission compared to its neighbors and other developed countries. On the other hand, the country has been expanding its protected area network. The benefits of such protection are global whereas its opportunity cost in terms of foregone benefits is local. Therefore, Nepal has to make a strong argument to garner international support for poverty reduction and disaster risk management.. Prof. Tiwari also brought to the fore the fact that improvement is needed in infrastructure and services that reduce disaster risk for the improved coping capacity of disaster prone communities. He also suggested that improvement in governance and initiation of incentive mechanism are needed. He concluded by saying that the major problem for the execution of the NAPA is the availability of funds. Since Nepal, as a developing country, is not able to contribute all the expenditure for NAPA execution, donor community support is needed, he said.

The details of Prof. Tiwari's comments are given in Comment II.

Floor Discussion

After the comments from the lead commentators, the floor was opened for discussion. The following comments were made from the floor on the papers presented during this session.

Yam Nath Sharma - MoLD

- ◆ Process should be screened from the environmental sustainability aspect and should be addressed from the point of environmental hazards too.
- ◆ The role of the local government is very important for the implementation of adaptation processes.

Mani Nepal - SANDEE

- ◆ There is no uniform situation with regard to poverty incidence among the mountains and hills in the regional context.
- ◆ There is lack of information or data to understand the impact of climate change on agriculture. Hence, data base should be developed.

Rajendra Khanal - Chief, IUCN Nepal

- ◆ We need to analyze the outcome of our plans and programmes. Even with all these plans and programmes, we are still net importers of food grain. We therefore need to analyse the root cause of this situation.
- ◆ We need to consider why we are facing water scarcity even though we have the second largest water resources.
- ◆ We need to analyze the prerequisites for carbon trade.
- ◆ There is dependency syndrome in the high hills due to subsidized rice provided by the Nepal Food Corporation. To cure this syndrome, we need to promote indigenous crops.
- ◆ There are high prospects of medicinal herbs, and we need research on relevant crops suitable to the region.

Shyam Upadhyaya

- ◆ Mr. Raj Babu Shrestha's paper is too general and not specific. It is not based on a case study or project or programme.

Prof. Madan Koirala

- ◆ There is limitation in translating policy into action. Hence, it is difficult to turn plans into reality.

Dina Nath Tiwari - Practical Action

- ◆ Mr. Raj Babu Shrestha's paper is general and, in reality, the situation is different from what he has portrayed. All deprived classes of people are not affected in the

same manner. The effect of climate change depends upon profession. Those who make gold jewelry ornaments as a profession are not affected by climate change; however, people involved in and dependent on natural resources are vulnerable to the impact of climate change.

- ◆ The adaptation measures stated in the paper are not only due to climate change but also due to other socio-economic factors. This has to be revised.

On Batu Krishna Upreti's paper

- ◆ Are we going to be driven by outsiders? We need to think properly. It seems that we are going to be workers for donor agencies. We need to consider whether we are going in the proper direction.

Dr. Dinesh Bhuju - NAST

- ◆ Poverty will not be reduced due to policies or processes; rather it can be reduced only with the help of science and technology.
- ◆ Thus, we need to invest in science and technology as well as Research and Development, which is lacking in Nepal.
- ◆ Prof. Pyakuryal rightly pointed out the need for bio-technology which is important for agricultural development.
- ◆ Emerging countries like India and China are investing heavily in R&D. For example China invests about 2 % of its GDP in R&D.

Dr. Sumitra Amatya - SWMRMC

- ◆ Action is more important than policies and programmes to save our earth.

Jishnu Subedi - Institute of Engineering, TU

- ◆ Many of the plan statements are not realized in action.
- ◆ Adapting mitigation mechanism can contribute to micro-climate. Hence, we need not minimize the issue of mitigation mechanism.

After the comments were made, the presenters of the respective papers clarified the issues raised.

Batu Krishna Upreti's response:

- ◆ The Ministry of Environment is not doing any implementation work. It is working as a coordinating agency.
- ◆ We need to consider the poor but develop pro-rich programs.
- ◆ We need funds for the adaptation programmes. In order to get the funds, more prerequisites are required to be fulfilled.
- ◆ It is our compulsion to follow adaptation.
- ◆ The NAPA is prepared and executed as a prerequisite for funding.
- ◆ There is a problem of data.
- ◆ Our strategy is to strengthen the local institutions.
- ◆ We will follow a low energy development path. And even though it is not a requirement, we will follow it voluntarily.
- ◆ Carbon trade can be beneficial for the country. However, the government does not involve itself in carbon trade but will facilitate for the private sector.
- ◆ To achieve the desired goal, all organs of the government should follow the policy prepared by the government.

Mr. Raj Babu Shrestha accepted all the suggestions made by the commentators and gave his assurance to address the comments made on his paper.

At the end of the session, the Chairperson gave his concluding remarks and stated that climate change is a global phenomenon but its impact is local. He said that we need to follow mitigation measures along with adaptation measures. We also need research on how different sectors and areas are affected due to climate change and what can be done.

7. AFTERNOON SESSION AND PRESENTATION BY EXPERTS

The second session started at 13:30 hrs. The session was chaired by Mr. Krishna Gyawali, Secretary at the Ministry of Local Development. Four papers were presented in this session. The first paper, presented by Dr. Govinda Koirala, NRM Economist, was on Economic Analysis of Local Government Investment in Rural Roads. The paper was the outcome of the findings of a study sponsored by UNDP. The paper compared labour based technology with equipment based technology in rural road construction in terms of their economic performance and environmental hazards and greenery. It showed that roads built through equipment based technology are more vulnerable to landslides and also damage greenery. Roads constructed using labour, on the other hand, are green roads and are less prone to landslides.

The study also showed that equipment is cheaper than labour because of which the use of equipment for the construction of rural roads is more prevalent. Similarly, the budget is released during the last month of the fiscal year and, if it is not used within the fiscal year, it will be frozen. Due to this, equipment is used for rural road construction as this is faster than labour so as to utilize the budget within the stipulated time frame.

The study further showed that even though the cost is high in the case of labour based roads, such roads have 30% higher return than equipment based ones. As labour based roads provide more employment to the poor, it is always pro-poor and environment friendly.

The paper suggested the following:

- ◆ Use of bulldozers and rock blasting materials should be banned in rural road construction.

- ◆ Blended technology, i.e. use of both labour and equipment in rural road construction, is a viable option. Excavators, for instance, can reduce the cost and can also perform faster and be less harmful for the environment.
- ◆ Use of equipment is more desirable in the case of road widening, road construction in an area of long unmanned alignment, and when breaking of rocks is involved.
- ◆ The practice of development budget freezing at the end of fiscal year should be stopped.
- ◆ Budget should be made available at the beginning of the lean season (i.e. November)
- ◆ A separate budget head for hiring technical manpower should be provided.
- ◆ TDMP should be revised and updated

The full text of the paper is given in Paper Presented IV.

The second presentation on Local Government Revenue Raising from Natural Resources was presented by Mr. Som Lal Subedi, Joint Secretary of the Ministry of Local Development. Mr. Subedi shed light on the different legal provisions under which revenue is collected for the utilization of natural resources. He also highlighted the provisions of sharing of revenue. He estimated that about 5,000 million rupees comes as revenue from natural resources to the local and central government.

He raised the following issues in this regard:

- ◆ Need for participatory local planning and targeting vulnerable communities
- ◆ Lack of institutional capacity of local bodies for pricing and investment
- ◆ Lack of central coordination and monitoring mechanisms
- ◆ There is less effort on the part of local bodies as the present resource seems to be already sufficient for them

- ◆ It is difficult to implement the provisions of the Acts related to extraction and processing of natural resources as well as contracting Acts
- ◆ Lack of investment plan even in the face of continued revenue yield
- ◆ There is a problem in providing compensation to affected people
- ◆ Lack of a national integrated frame on natural resources utilization
- ◆ Lack of understanding of new phenomena, and lack of vision and revenue planning
- ◆ Environmental, poverty and disaster concern are not taken seriously
- ◆ Lack of expenditure credibility and transparency
- ◆ Many negative impacts seen: floods, landslides, biodiversity loss, local conflict, vested interests of the local elites, deteriorating law and order situation
- ◆ Lack of a localized technology

In order to address the issues that he raised, Mr. Subedi made the following general as well as technical suggestions:

General

- ◆ Role delineation of the different tiers of government under federalism
- ◆ Matching services to be delivered by the respective tier of the government
- ◆ Linking with overall fiscal transfers and equalization
- ◆ Protection of natural resources and environmental degradation
- ◆ Special local benefits assurance
- ◆ Integration of institutional capacity, accountability and financial discipline
- ◆ Deepening democracy and inclusive budgeting at the local level
- ◆ Political commitment
- ◆ Understanding the link between climate change and development
- ◆ Compliance of laws and policies

Technical

- ◆ Potentiality assessment and cost benefit analysis, including social cost
- ◆ Vulnerability mapping/Hazard mapping
- ◆ Preparation of land use planning
- ◆ Sectoral framework and coordination
- ◆ Specialized human resource
- ◆ National perspective and monitoring tools
- ◆ Development of long-term leasing policy
- ◆ Viable geographical size of local government
- ◆ Adoption of disaster risk reduction techniques, including that for earthquake risk reduction, in infrastructure development and operation

The full text of the paper is given in Paper Presented V.

After the two presentations, Lead Commentator Dr. Chandra Mani Adhikari gave his comments. Commenting on Dr. Koirala's paper first, Dr. Adhikari raised the following issues:

- ◆ We need to be clear about the approach of rural infrastructure development, including roads
- ◆ Need to specify the sources of funding and its modality while designing the budgetary framework
- ◆ Need to enforce financial related laws and regulations
- ◆ Need to be aware about the technical and environmental issues and take the initiative for providing technical assistance to and the capacity development of local bodies
- ◆ Need to consider the operation and maintenance parts while planning, designing and constructing roads
- ◆ Need to include rural infrastructure and their significance in livelihoods in the curriculum of school education
- ◆ Develop alternative options for displaced households, communities and groups due to rural road construction through employment, income and land

- ◆ Roads should be pro-poor, resource adequacy based, environment friendly, technically viable, risk free, inclusive and market friendly

The details of Dr. Adhikari's comments are given in Comment III.

Dr. Adhikari also commented on Mr. Som Lal Subedi's paper and raised the following major issues:

- ◆ Develop programmes related to revenue generation on the basis of plan designed for the conservation and management of natural resources and use these optimally as per the geographical location-specific strategies and the resource mobilization capacity and potentiality of different categories of VDCs in line with the proposed federal system
- ◆ Preserve the rights of the poor while mobilizing revenue and encourage the poor to conserve and preserve resources
- ◆ Design the revenue policy as per the nature of natural resources
- ◆ Consider inter-generational equity while managing natural resources
- ◆ Correlate the expenditure functions and revenue assignments with basic functions like Planning, Regulation and Institutional Management
- ◆ Develop policy guidelines, procedures and norms so as to avoid policy gaps and conflicts in resource extraction and use, and revenue generation and sharing
- ◆ Revenue mobilization from natural resources should be associated with the overall development of local governments. In this regard, revenue raising should be considered not only in terms of harvesting but emphasis should also be given to plantation and other revenue generation activities like enterprise development.

The details of Dr. Adhikari's comments are given in Comment IV.

Floor Discussion

Following the comments from the lead commentator, the floor was opened for discussion. The following are the comments raised during the floor discussion by the respective participants on the papers presented during this session:

Shailendra Kumar Jha - ILO

- ◆ The cost for road construction is very high i.e. Nrs. 3-4 million per km. Hence, roads should not be constructed haphazardly.
- ◆ There is lack of feasibility study while constructing rural roads
- ◆ There are many bulldozer roads within the country
- ◆ DTMP is not yet updated, which may cause problems in road construction
- ◆ Wage rate fixation system should be harmonized and made scientific
- ◆ The guidelines for VDC and DDC for the construction and utilization of natural resources should be implemented

Narayan Chaulagain - AEPC

- ◆ It is not clear how to measure return from rural roads
- ◆ The use of vehicles on rural roads may have been affected due to other reasons – it is difficult to measure the impact
- ◆ Should social or environmental benefit from the road be measured?

Sandesh Hamal - Care Nepal

- ◆ It would be better if the paper presenter would have linked the topic with today's context, i.e. how the poor are affected due to the use of different technologies in rural road construction

Dr. Koirala's response:

- ◆ The report covered unaccounted cost and benefits, and many other issues are also addressed in the full report

Som Lal Subedi's response:

- ◆ Functions, funds and functionaries should go simultaneously at the local level
- ◆ There is no problem of budget release; the problem is in the plan formulation process
- ◆ There is a problem of execution of programmes and policies

With the floor discussion having been completed, two additional papers related to alternative energy, and community and leasehold forestry were presented.

The first paper, presented by Dr. Narayan P. Chaulagain, Executive Director of AEPC, was on Alternative Energy: Linking Climate and Environment Consideration. He raised the following issues in his paper:

- ◆ The use of Renewable Energy Technology is relatively low in relation to the potentiality of resources. It is less than 20% of all the available capacity of the technology.
- ◆ HDI and per capita energy consumption have a direct relationship
- ◆ Energy services are proven catalysts for economic and social transformation
- ◆ Alternative energy plays a positive role for achieving the MDGs

Dr. Chaulagain explained the role of Renewable Energy Technology (RET) on Climate Change Mitigation & Adaptation through livelihood improvement of the poor. In this regard, the paper highlighted the following with regard to the role of RET:

- ◆ Reduces deforestation, use of fossil fuel and indoor air pollution related diseases
- ◆ Contributes to GHG emission reduction
- ◆ Supports the establishment of micro-enterprises
- ◆ Provides access to information (TV, Radio, Telephone)
- ◆ Saves time which can be utilized in IGA and community development
- ◆ Leads to savings on the regular expenses (energy, health etc.) of HHs

- ◆ Reduces indoor air pollution and improves the physical environment of surroundings
- ◆ Enhances women empowerment and provides girl children with the opportunity for education

The full text of the paper is given in Paper Presented VI.

The last paper of this session was: "Community and Leasehold Forestry: Implications for the Poor, Environment and Climate Change" by Dr. Bharat Pokhrel and Mr. Peter Branney.

The paper highlighted the following points:

- ◆ Policies and practices of Community and Leasehold Forestry are increasingly becoming pro-poor and climate resilient
- ◆ There are visible and measurable impacts of community and leasehold forestry in reducing poverty and the negative effect of climate change
- ◆ For Nepal, the MDG goal of reducing poverty is still a national priority, and the climate change agenda is expected to contribute towards that goal
- ◆ Pro-poor governance is the key to increasing poor people's access to forest resources as well as their capacity for climate resilience
- ◆ We can learn from multi-stakeholder institutional mechanisms in targeting the poor in a coordinated way, and the landscape approach is the way forward to initiate the climate change agenda
- ◆ There are nearly 20,000 community groups working for the management of natural resources, and about 15,000 are community forest user groups
- ◆ These user groups are our social capital. Thus, undermining them will be counterproductive for the economy and the society
- ◆ Community forestry and leasehold forestry have given user rights but no property rights

- ◆ Without clear transferable property rights, there is less scope of protection of natural resources.
- ◆ Thus, it is necessary to include the concept of property rights over the common property resources in the coming constitution

The paper also highlighted the following practical issues related to climate change and poverty:

- ◆ The poverty agenda still remains important and it cannot be replaced by the climate change agenda until poverty is eradicated
- ◆ Climate change adaptation and mitigation measures should contribute to reduce poverty and vulnerability
- ◆ No livelihood rights - possibly no benefits from REDD
- ◆ No property rights - possibly no benefits from REDD
- ◆ Property rights of land does not necessarily guarantee the 'rights over carbon'
- ◆ Community and leasehold forestry have high performance but low prospect of benefits from REDD
- ◆ Climate change adaptation measures are likely to benefit Nepali farmers more than mitigation measures

Recommendations

- ◆ Recognise the contribution of CF and LHF in protecting the environment and reducing poverty
- ◆ Draft clear policy and legal framework, simple procedures and local level institutional mechanisms to reach the poorest households
- ◆ Value multiple functions of forests for both climate change adaptation and mitigation
- ◆ Do not divert attention from the poverty agenda; promote pro-poor governance as the prerequisite to fight against poverty and climate change instead

- ◆ Reduce the transaction cost of the poor in securing services by recognising the role of local groups as service delivery agencies and the local government as the coordinating agency
- ◆ Focus on building technical capacity of communities for climate change adaptation
- ◆ Recognise climate change and poverty as overarching themes that every agency has to contribute to collectively through multi-stakeholder mechanisms
- ◆ Recognise landscape as the unit of intervention for poverty reduction and climate change

The full text of the paper is given in Paper Presented VII.

Prof. Dr. B.N. Tiwari, the Lead Commentator, commented on the paper on Community and Leasehold forestry. He highlighted some issues and challenges in leasehold and community forestry. Among the comments that he made, the significant ones include the following:

1. Conflict between Community and Leasehold Forestry

With the successful implementation of the Community Forestry Programme in Nepal, the HLFFDP has been implemented. However, after a decade of implementation, it has been realized that there is some sort of conflict between the community forestry and leasehold forestry programmes in Nepal. There are studies suggesting that the poverty aspect of the leasehold forestry approach can be included in the community forestry programme. Thus, they suggest that a separate leasehold forestry programme is not warranted.

On the other hand, there are studies revealing that the community forestry programme is not pro-poor and is not targeted. Moreover, it does not focus on the economic aspect. Therefore, these studies justify the HLFFDP which targets the poor.

However, as the HLFFDP targets the poor, there is conflict between those who are the project beneficiaries and those who are not. Using case studies in the middle hills of Nepal, an investigation was made on the interactions between the leasehold forest user groups and the dependent community, which was not included in the programme. It has been revealed that there is a high degree of social conflict between users and non-users with an increase in forest degradation. Moreover, it has also been found that poor and marginalised people are excluded from the benefits of the HLFFDP.

2. Forest Policy in Favour of Community Forestry

The Forest Policy is in favour of Community Forestry Programme. According to the Forest Act 1993, community forest gets priority over leasehold forest. There is no legal mechanism for the formation of leasehold forest groups like community forest groups. Moreover, the smaller group size formed under the HLFFDP is vulnerable and faces tremendous managerial problems.

Prof. Tiwari then made the following recommendations:

- ◆ Both community forestry and leasehold forestry should complement each other rather than work as rivals
- ◆ Effective monitoring of the leasehold forestry is necessary so as to make it an effective pro-poor programme
- ◆ Both community forestry and leasehold forestry can regenerate forest resources whose benefits extend beyond Nepal. Therefore, the government should be able to put forth arguments for larger grants from other countries for climate adaptation in view of Nepal's low carbon emission and larger amount of forest resources generated as a result of the community and leasehold forestry programmes.

- ◆ Community and leasehold forestry should serve as poverty reduction programmes
- ◆ The government should support these two programmes and mobilize communities and their resources for the benefit of the communities and the country.

The details of Prof. Tiwari's comments are given in Comment V.

Floor Discussion

After the comments from the lead commentator, the floor was opened for discussion. The following are the comments raised during floor discussion by respective participants.

Mani Nepal - SANDEE

The findings of the household budget survey show interesting results, i.e. households using improved stoves use more energy as comfort since they generate less smoke or no smoke. The use of energy, as a result, has increased rather than decreased due to the improved technology.

Dr. Chaulagain's response:

Technology does not work properly if it is not utilised properly.

Dr. Pokharel's response:

- ◆ Only 30000 households are covered by leasehold forestry, and about 80% of the households with leasehold forestry are also members of community forest user groups. Thus, it does not make much of a difference if we discuss the impact by combining the two together.
- ◆ Community forestry learned much from leasehold forestry and it is a more pro-poor institution than any other institution in the country.
- ◆ Community forestry is an appropriate sustainable development programme

8. WORKSHOP CONCLUSION

At the end, Mr. Krishna Gyawali gave his concluding remarks from the chair. He pointed out that road planning is already there in the VDCs and DDCs. He said that although the DTMP is not being updated properly, the Ministry of Local Development is planning to update it in the near future for all the districts. According to him, the ministry is going to revisit the User

Committee Operation Manual. After approval from the Cabinet, it will help further improve good governance. He also informed that the ministry is preparing the directives for the management of all party mechanisms. After the completion of these directives, it will be much easier to manage local development activities. Mr. Gyawali added that the ministry is planning to revise the road tax on LSGA from Appendix since it is very old and not practical.

PART III

PAPERS PRESENTED

PAPER I

Integrating Environment, Poverty and Green Economy into National Planning Process

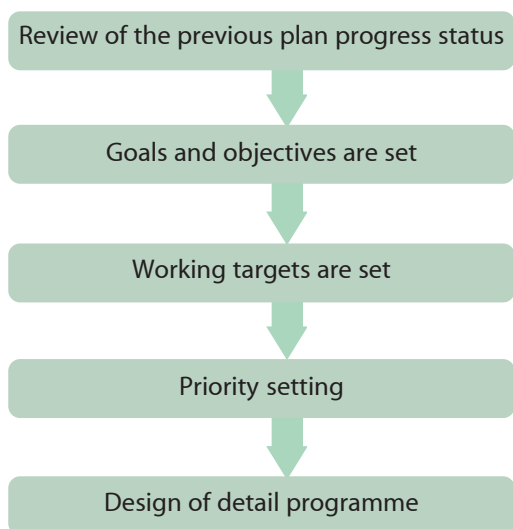
Pushpa Lal Shakya¹
Gopi Nath Mainali²

Periodic Plan

The periodic plan is the systematic management of available resources to achieve a definite objective/goal within a specific period of time.

- ◆ This is a plan of action of all the sectoral ministries
- ◆ It is usually made for a 3 to 5-year period
- ◆ It tries to address development concerns
- ◆ It contains goals, objectives, strategy, working policies
- ◆ Prioritization of programmes and projects with budget are made
- ◆ Implementation, Monitoring and Evaluation mechanisms are set

Schematic View of Periodic Plan Preparation Process



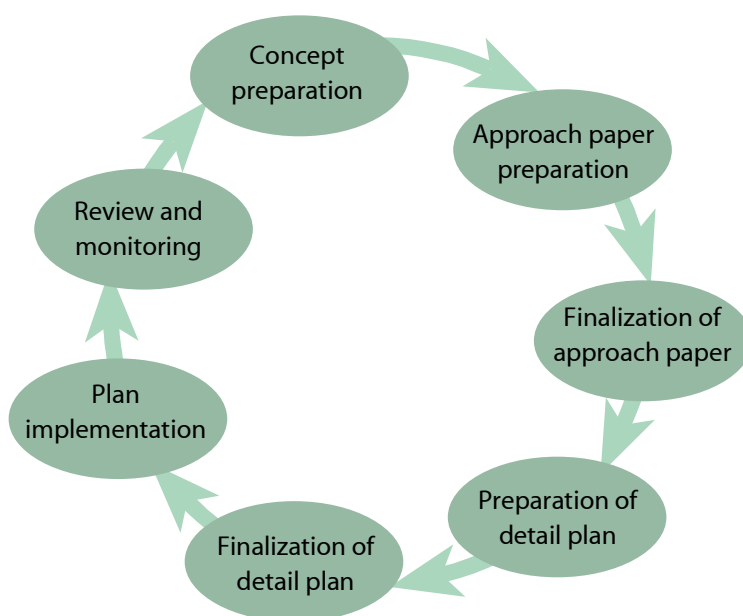
¹ Joint Secretary, Economic Management Division, National Planning Commission Secretariat, Kathmandu, Nepal.

² Joint Secretary, Infrastructure Development Division, National Planning Commission Secretariat, Kathmandu, Nepal.

The NPC planning process is based on the following steps:

- ◆ Review/analysis of previous plan
- ◆ Development of preliminary concept paper
- ◆ Consultation with multi stakeholders
- ◆ Preparation of draft approach paper
- ◆ Consultation with multi stakeholders
- ◆ Endorsement by the NPC and discussion in the National Development Council (NDC) meeting for its approval
- ◆ Approval of approach paper by the NDC
- ◆ Preparation of detailed Plan document (Thematic groups of sectoral ministries, technical groups and the NPC)
- ◆ Review
- ◆ Approval by the NPC and endorsement by the Cabinet
- ◆ Plan implementation

Schematic View of the NPC Planning Process



Why should Poverty and Environment be Integrated in the Planning Process?

MDG 1 Poverty: environment linkages

Livelihoods: natural resource dependence of poor and disadvantaged i.e. subsistence agriculture, NTFPs, grazing, tourism and portering

Vulnerability to climate shocks such as floods and droughts and long term changes (glacial retreat and lake outburst)

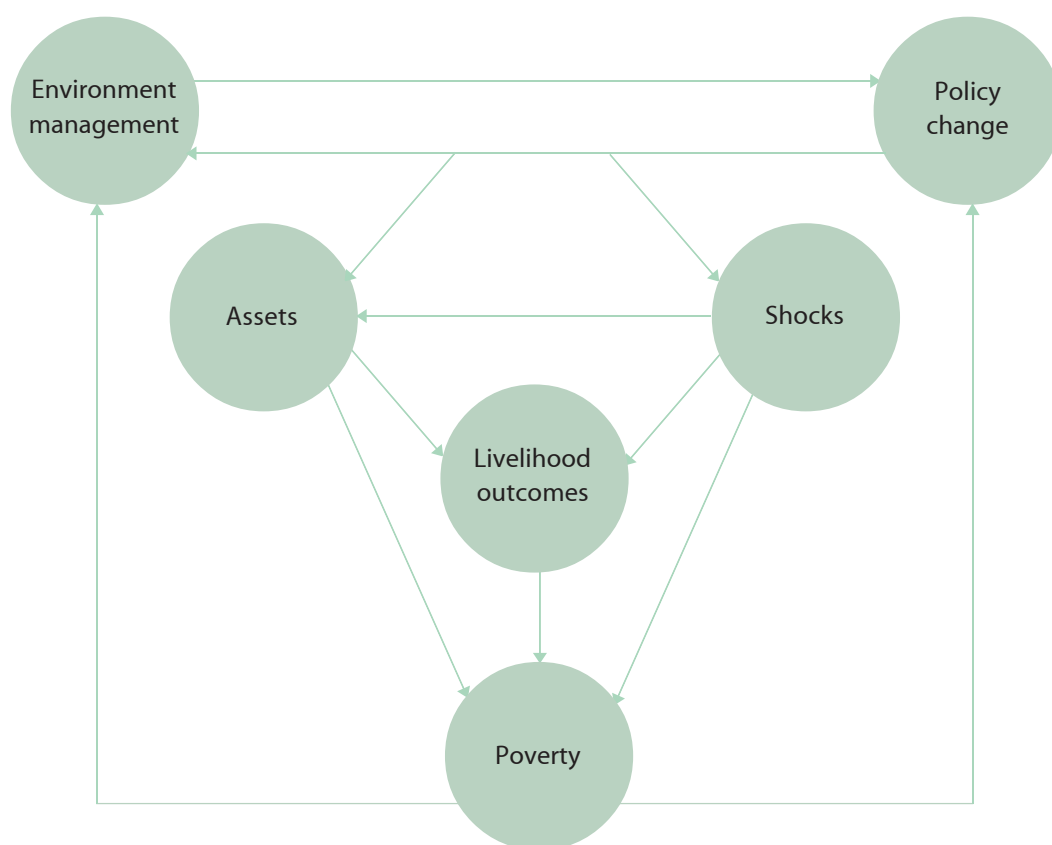
MDGs for health, education and gender – environment linkage

Illness from **dirty indoor air**, especially for women and children

Lack of **clean water and sanitation**

Declining availability of water and biomass affects women and children most

Poverty - Environment Nexus



What is a Green Economy for Nepal?

Ways to increase economic development and employment through environmental opportunities

- ◆ Small scale natural resource based enterprises (e.g. NTFPs, tourism, renewable energy etc.), and urban employment (waste management)
- ◆ Public works programmes for natural resource management (e.g. water, soil and forestry conservation) and urban management (waste management)

Recommendations: Why poverty, environment, climate issues for the planning and budgeting?

- ◆ Development programmes redesigned to take account of climate risks
- ◆ More investment in environment issues that matter to poor people: environment health, better natural resource management
- ◆ Rural road investment must be economic – less “bulldozer” roads and more labour based environmentally friendly roads
- ◆ Public works programmes that promote natural resource management

PAPER II

Climate Screening, Adaptation Actions, Financing and Policies: Essentials for Improving the Livelihoods of the Poor

Ganesh R. Joshi, PhD¹
Batu Krishna Uprety²

Background

The Earth's climate has changed and will continue to change naturally and through anthropogenic emissions of greenhouse gases (GHGs). Anthropogenic activities have accelerated the changing pattern of climate systems, and this change is of priority concern to all of us.

The First World Climate Conference in 1979 identified climate change as the major global challenge and called upon the governments to take urgent actions to safeguard life, livelihoods and life-support systems from the adverse impacts of climate change. Outcomes of scientific studies and such conferences resulted in the preparation and adoption of the UN Framework Convention on Climate Change (UNFCCC) in 1992, and the Kyoto Protocol in 1997. Scientific understanding and awareness of climate change have increased along with the reports of the Inter-Governmental Panel on Climate Change (IPCC). The IPCC states that warming of the climate system is unequivocal, as is now evident from observations in global average air and ocean temperatures, widespread melting of snow and ice, and rising glo-

bal average sea level (IPCC, 2007). Furthermore, potential threats and impacts of climate change are evident on agriculture, forests, biodiversity, water resources, and health sectors. Observed scenario with high level of confidence clearly indicates the change in the climate system at a faster rate. Our increased understanding about the potential threats and economies of adverse impacts, cost of inaction and/or delay in action have been instrumental in drawing the attention of world leaders - politicians, scientists and academicians, and religious and civil society leaders – to take immediate actions to address the adverse impacts of climate change with the principles of common but differentiated responsibilities and respective capabilities.

Countries are at different stages of development. Some countries are already developed using the scarce global resources, developing technologies, building capabilities and providing finance. Some are developing, trying to increase and/or maintain growth rate, and some are still least developed and are made more dependent on technical and financial resources. The trade imbalance, conflict, economic recession, attitude to support and make

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others dependent, unequal resource use and high rate of products consumption, common property (such as air, atmospheric space) use leading to “tragedy of the commons”, and shared responsibilities for cleaning the environment, population growth, food production, energy production and use, and monopolized technologies etc. are all challenging the very survival of human beings in this planet by sufficiently disturbing the very functioning of the life-support systems. This has created a great disparity with increased gap between the rich and poor, developed and developing countries, and increased conflicts between the “haves” and “have nots”. This ground reality has yet to be understood clearly by the countries and people having the capacity to cope with the challenges financially, technically and technologically, and expand a new mode of cooperation to support the livelihoods of the “have nots”.

Climate change is a serious and immediate threat to development. It has accelerated insecurities of food, water and energy, and challenged our efforts to protect people from climate induced disasters such as floods, droughts, and disease outbreaks. Damages from climate change have already been felt, and mitigation or reduction of GHG emissions is urgently required.

The World Bank’s 2010 World Development Report (a report dedicated to development and climate change) advocates for a climate-smart world, and urges the international community *to act now, to act together and to act differently* (WB, 2010). It provides hope, but requires substantial efforts, political will, finance, technologies, and capacities to have a decarbonized economy. The challenge is who should and will fulfill these conditionalities; when action will start; when and how funding will be provided; who will benefit from funding – GHG “emitters” or the “sufferers”. There are several unanswered questions as current

financing for adaptation and mitigation is only \$10 billion as indicated in the Copenhagen Accord, and the projected need for \$70 billion for adaptation and \$400 billion for mitigation by 2030 (WB, 2010). It is still unclear who is administering this fund. It is estimated that the present pledged fund is less than 5% of what may be needed by 2030 to address the ongoing threats of climate change.

Climate Change Threatens Nepal

Nepal – a mountainous country known for continued supply of ecological, economic and social services and with the most vulnerable ecosystems – is increasingly threatened by the adverse impacts of climate change. Mountains – the depository of ice, glaciers and water – are being challenged for their existence due to increased emissions of GHGs having varied global warming potentials. Scientific information about the impacts of climate change in the Himalayas is grossly lacking.

Prevalence of wide-spread poverty and economic deprivation is a major challenge in the mountains. The challenge of poverty reduction is extremely daunting even if there are opportunities. The abundant natural resources, which are waiting for their full utilization, would contribute to address this challenge, but again it needs sufficient finance, technology, and capacity to rationally utilize them.

Mountaineers’ first-hand experiences related to fast rate of snow and glaciers melting call for urgent actions. Several mountaineers including Mr. Appa Sherpa, 20-times Mt. Everest Summiteer and the SAARC Climate Ambassador, has repeatedly informed us about the high rate of snow melting in Mt. Everest and other mountains. Sebastian Smith wrote in The New York Times (16 July 2010): “Main Rongbuk Glacier experienced an average vertical loss of 330 feet between 1921 and 2007”. Out of 2315 gla-

cier lakes of various sizes in Nepal, 20 glacier lakes are highly vulnerable. In some glaciers, the rate of glacier retreat is as high as 20 m/year. Snow and glacier melting might increase water in Nepal's river system by about 5% till 2030, and decrease by 28% by the end of this century (Chaulagain, 2007).

At present, one can see a number of black stones (Kalapatthar) that were previously covered with white snow on Mt. Everest. It means that Mt. Everest – roof of the world, a pride of the global community, and a global heritage for mankind – deserves special attention to be saved from climate change. Furthermore, the number of “climate refugees” is increasing as about 150 people from the high lands to lowlands (Mustang district) were encouraged to resettle due to adverse impacts of climate change. If “vertical Tsunami” occurs, it will affect the people, ecosystem and livelihoods of people living both upstream and downstream. Climate change has equally impacted agriculture and farmers, forests and users, water resources and business communities, and human health adversely. These diverse challenges should be undertaken as opportunities for sustainable mountain development to benefit people living both in the mountains and lowlands, resources and livelihoods.

A recent study indicates that 1.9 million people are vulnerable to climate change in Nepal, and an additional 10 million people are increasingly at climate risks (MoE, 2010). Climate change has increased risk of Malaria, Kala-azar and Japanese Encephalitis outbreaks; early sprouting, flowering and fruiting have been observed in some wild plants in recent years; and there has been a shifting of herbs and vegetation towards higher altitude. Climate-induced disasters have repeatedly damaged infrastructure like roads, bridges, community and public buildings, schools etc., and around 2.45% of GDP has been estimated lost by disaster every year. More than 4000 people have died

in the last ten years due to climate-induced disasters with corresponding economic losses of about \$ 5.34 billion. Loss of human lives and property from floods and landslides as well as fire are increasing rapidly.

What has been done so far?

Mountain fragility could be protected by increased vegetation cover and environment-friendly infrastructure development. As a Party to UNFCCC and KP, Nepal has given continuity to a number of activities that directly or indirectly contribute to address the adverse impacts of climate change in the mountains. These include:

1. Natural resource conservation, in particular the forests, soil and water through user group approaches, has been promoted. Forests have been managed through different management regimes such as community forests, leasehold forests, collaborative forests, and buffer zones.
2. Active engagement of more than 2 million people with about 18,000 user groups (of different management regimes) in forest conservation and from which they are benefiting.
3. The focus of the government's development policy on maintaining forests to cover about 40% of the total land area of the country. About 24% of the landmass is already under the protected area system, and are also managed by NGOs and communities.
4. People living in the buffer zone areas receive 30 to 50% of the total revenue generated by protected areas. This has also developed functional carbon sinks and allow for appropriate level of carbon sequestration. Nepal has shifted its policies towards the betterment of the people and country. Strict protection approaches have been changed to wildlife farming for poverty reduction.

5. Previous approaches of forest exploitation have been converted to sustainable use and benefit sharing, and management models have been expanded from community forestry to collaborative forest management (where distant users also benefit). Biodiversity conservation has been integrated into environmental impact assessment. Previous approaches of considering forests as a “free gift” of nature has been shifted towards economic valuation of goods and services.
6. NGOs are given management responsibilities for conservation areas etc. etc.
7. Sustainable development path and clean energy development policies have been adopted, a clear indication that the country’s economic development does not emit GHGs that accelerate global warming.
8. Even though our development path is always geared towards low emission development, our greenhouse gas emission is negligible.
9. Alternative energies are extensively promoted to meet the demand for clean energy in the rural areas. The GoN has launched and is launching massive micro-hydro, solar and wind energy programmes in feasible areas to benefit the local communities and poor people.

A number of initiatives have been implemented to benefit from the UNFCCC process after being a Party to this Convention in 1994. Some of the milestones are as follows:

1. During the period 1994 to 2006, Nepal prepared the first Initial National Communication Report in 2004 and shared it with the Parties to UNFCCC. Some activities were implemented towards raising public awareness.
2. During 2007 to 2009, Nepal initiated the following: (i) prepared the National Adaptation Programme of Action (NAPA); (ii) issued procedures for the approval of the Clean Development Mechanism (CDM) projects to benefit from KP provisions; (iii) accessed funding from the World Bank’s Climate Investment Fund to launch a Pilot Programme for Climate Resilience; (iv) identified capacity building needs under the National Capacity Self-Assessment (NCSA) Project; (v) Initiated the preparation of the Second National Communication (SNC); (vi) developed and implemented the ADB-funded project on strengthening capacity for managing climate change and the environment; (vii) constituted the Climate Change Council under the chairmanship of the Rt. Hon’ble Prime Minister as a high-level policy coordinating body; (viii) organised the South Asian Regional Climate Change Conference (from Kathmandu to Copenhagen) and signed MoU with 14 donors and development partners wishing to support Nepal on climate change activities; (ix) prepared a status paper for COP15; (x) organised a Cabinet Meeting at Kalapatthar at the base camp of the Mt. Everest on the eve of COP 15 so as to send a message of the imminent threat of climate change to a mountainous country; (xi) organised a summiteers summit to save the Himalayas in Copenhagen; (xii) highlighted the urgency of mountain platform through the statement of the Rt. Hon’ble Prime Minister during COP15; and (xiii) organised an inception workshop on GEF/UNEP-supported SNC and technology needs assessment. A majority of the activities were conducted in 2009 because of which it is considered as the ice-breaking year on climate change regime in Nepal. Nepal put climate change as a national agenda of high priority in 2009.
3. In 2010, the Government of Nepal established the Climate Change Management Division at the Ministry of Environment (MoE). The GoN has initiated a number of activities during May to October 2010 for the effective implementation of the climate change regime. The GoN has: (i) de-

cided to take the lead role to form the Alliance of Mountain Countries, and MoE signed a 3-year-long MoU with ICIMOD to work jointly for raising mountain issues during the negotiations of the Multilateral Environment Agreements in general and UNFCCC in particular, and make every effort to benefit from legal instruments; (ii) designated MoE to function as the National Implementing Entity (NIE) to the Adaptation Fund Board (AFB) to UNFCCC which will help Nepal to directly access funding for the implementation of the adaptation actions; (iii) approved NAPA on 28 September 2010, and organized a launching programme on 4 November 2010; and (iv) accessed funding of the CIF Programme for Scaling Up Renewable Energy in Low Income Countries (SREP).

4. In order to operationalise NAPA, MoE has:
 - (i) signed a MoU with DFID for, *inter alia*, the design and piloting phase to formulate country framework and strategies on adaptation and climate resilience and piloting the Local Adaptation Plan of Action (LAPA); (ii) formed Multi-stakeholder Climate Change Initiative Coordination Committee (MCCICC) to promote functional level coordination amongst the stakeholders and streamline climate change activities in Nepal; (iii) organized jointly with ICIMOD an International Expert Consultation Meeting on Climate Change; (iv) also organized in collaboration with the UNFCCC Secretariat the 18th meeting of the LDC Expert Group (LEG) in October 2010. The MoE is also engaged in developing low carbon and climate resilient development strategy for Nepal, and activities related to down scaling and community vulnerability assessment. The readiness plan for REDD has also been developed. The MoE is equally engaged in improving the draft climate change policy initiated in 2007.

In order to benefit from the climate regime and reduce the adverse impacts of climate change, Nepal underscores the importance of climate screening, NAPA, and new and additional financing.

Climate Screening

Climate screening – a tool to evaluate the proposed projects – would be considered useful to making our development process climate-friendly by knowing the perceived and identified impacts of the proposed action on the climate system. It will help countries to minimise risks, promote understanding about project and associated climate risk, and attain the goals of sustainable development. Nepal is exploring possibilities and identifying barriers in using this tool in the national planning process.

Risks from climate-induced disaster on the development process and livelihoods of the poor could be minimised through interventions after knowing the degree, magnitude and duration of the risks. Climate-induced disasters such as floods, droughts, epidemic, mass wasting, sedimentation, and fire would greatly affect farmland, livestock and forests/grasslands – the livelihoods of the poor people of Nepal.

As a starting point, sector-based climate screening forms could be developed and human resources, particularly involved in planning and implementation, could be oriented and/or exposed to best utilise them. This will help to ensure and address climate concerns in development planning, programmes and projects. This screening will also provide information about climate sensitive initiatives and ways and means to mitigate adverse impacts and augment beneficial ones.

NAPA

NAPA has been a national development agenda for Nepal. NAPA has been developed to open windows to access finances for the implementation of most urgent and immediate prioritised adaptation actions in response to the COP7 decisions in 2002. In Nepal's NAPA, priority adaptation actions have been identified for most important sectors

such as agriculture and food security, water resources and energy, climate-induced disasters, forests and biodiversity, public health, and urban development and infrastructures. The NAPA endorsed by the Government of Nepal on 28 September 2010, and launched on 4 November 2010, includes the following integrated programmes where priority activities have been clustered (Table 1) (MoE, 2010):

Table 1: NAPA Prioritised Programmes

SN	Programme	Estimated Cost (USD)	Remark
1	Promoting Community based Adaptation through Integrated Management of Agriculture, Water, Forest and Biodiversity Sector	50 million	Integrated Watershed Management in Churia to ensure ecosystem and community adaptation to climate change
2	Building and Enhancing Adaptive Capacity of Vulnerable Communities Through Improved System and Access to Service Related to Agricultural Development	44 million	Enabling climate vulnerable communities sustain livelihoods, and increasing adaptive capacity
3	Community Based Disaster Management for Facilitating Climate Adaptation	60 million	Building capacity to enhance community adaptation to climatic hazards and launching community based disaster risk reduction measures
4	GLOF Monitoring and Disaster Risk Reduction	55 million	GLOF monitoring and DRR, including early warning system development and hazard mapping
5	Forest and Ecosystem Management for Supporting Climate Led Adaptation Innovations	25 million	Tree management outside forests, energy plantations, and community based forest fire management
6	Adapting to Climate Challenges in Public Health	15 million	Reducing public health impacts of climate change through evidence based research and piloting and scaling up programmes
7	Ecosystem Management for Climate Adaptation	31 million	Rehabilitation of degraded mountain ecological zones, and conservation and promotion of medicinal plants and NTFPs in all potential ecological zones
8	Empowering Vulnerable Communities through Sustainable Management of Water Resource and Clean Energy Supply	40 million	Conservation of lakes, promotion of rain water harvesting structures and technologies, and improvement of multi-use system
9	Promoting Climate Smart Urban Settlement	30 million	Enforce building codes in municipal areas, rehabilitation of the vulnerable communities, and CDM projects to generate additional revenue
Total Estimated Budget		350 million	

*Note: Each programme focuses on capacity building, research and development, and awareness-raising.
Source: MoE, 2010.*

In order to bring NAPA options in the field, it also includes the implementation framework. The framework ensures the involvement of many actors and agencies – public sector, civil society and private sector – in implementing adaptation actions. The framework will facilitate the channeling of at least 80 percent of the financial resources and technical expertise for adaptation actions to the local level as efficiently as possible (MoE, 2010). The framework provides opportunities for coordination and management of adaptation actions at the central, regional and local levels as well. The MoE has already started exploring finances to implement the ground-level adaptation actions.

Finance

There are several financial packages that are in operation to implement climate change and NAPA activities. Adaptation actions could be implemented through national funding, and through international support. A number of funding arrangements have been made for climate change activities (Table 2). The developed countries have made pledges in several meetings and conferences, and roughly 30% of the total pledged funds (USD 26 billion) out of USD 25.8 billion has been deposited and 23% has been disbursed as of 9 August 2010 (Othmar et al, 2010).

Table 2: Existing Funds for Climate Change-related Activities

SN	Fund	Acronym	Type	Nepal's access
Within UNFCCC Regime				
1	GEF Trust Fund	GEF	Multi-lateral – GEF	For NAPA preparation and implementation
2	Strategic Priority for Adaptation under GEF Trust Fund	SPA	Multi-lateral – GEF	
3	LDC Fund	LDCF	Multi-lateral – GEF	
4	Special Climate Change Fund	SCCF	Multi-lateral – GEF	NIE yet to be accredited
5	Adaptation Fund	AF	Kyoto-multilateral	
Contribution to UNFCCC				
6	UN – REDD Programme	UN-REDD	Multi-donor Trust Fund	For REDD
7	Forest Carbon Partnership Facility	FCPF	Donor Trust Fund	
8	Forest Investment Programme	FIP	Donor Trust Fund	
9	Amazon Fund (Fund Amazonia)	FA	Norway/bilateral	
10	Congo Basin Forest Fund	CBFF	Development Bank, multi-bilateral	
11	International Forest Carbon Initiative	IFCI	Australia, bilateral	About USD 110m
12	Pilot Programme for Climate Resilience	PPCR	Donor Trust Fund	
13	Scaling up Renewable Energy Programme for Low Income Countries	SREP	Donor Trust Fund	USD 40m accessed Approached for NAPA implementation
14	Global Climate Change Alliance	GCCA	EU; bilateral	
15	Global Energy Efficiency and Renewable Energy Fund	GEEREF	EU; bilateral	
16	International Climate Initiatives	ICI	BM U-D; bilateral	Multi-bilateral
17	Clean Technology Fund	CTF	WB, Multi-bilateral	
18	Hatoyama Initiative	HI	Bilateral (JP)	
19	MDG Achievement Fund	MDG	UNDP;	
	(Environment and Climate Change Thematic Window)		Multi-bilateral	
20	Bilateral fundings			

It seems that funding for climate change programmes are available at the international level, and Nepal would have opportunities to access these funds to meet the needs of the climate vulnerable communities, and safeguard the lives of the impacted people. Nepal would get additional funding being a climate vulnerable country (out of 15 countries so far identified) and also being a LDC in the spirit of Article 4.9 of the UNFCCC. The basic issue and concern for Nepal is how to access the available funds and best utilise them for the poor and climate vulnerable people, thus linking climate change with its overall economic development.

Climate Change-friendly Policies

The Ministry of Environment initiated the development of climate change in 2007. It conducted studies, reviewed policies and legislations, organised 5 regional workshops and consultation programmes in Kathmandu, collected inputs, opinions, concerns and ideas from workshops, interpersonal contacts, interviews and questionnaires, and drafted a comprehensive policy. A number of activities were initiated after policy formulation started. In general, adaptation is mostly related to poor people and mitigation to entrepreneurs, commonly understood as comparatively rich in the society. Taking into consideration the emphasis of the draft policies, on-going climate change activities (such as NAPA, PPCR, institutional strengthening, SNC, PEI etc.), issues raised at international climate debates, approaches of the Three Year Plan, approval of the NAPA, existing coordination mechanisms and institutional arrangement, the MoE is revisiting the draft climate change policy. The policy will hopefully address the following broader areas in order to address the impacts of climate change in the mountains, and scaling up the on-going activities (MoE, 2010).

- 1. Climate adaptation, disasters and risk minimisation:** (i) implementation of NAPA in general and most urgent and immediate adaptation needs in particular in climate vulnerable communities, and climate-induced disaster (CID) areas and CID-prone areas; (ii) integration of income generating activities as an integral part of adaptation measures; (iii) making social and economic development climate adaptive for sustained benefits; (iv) mitigation of GLOF risk; (v) installation and continued monitoring of the functioning of the early warning system; and (vi) implementation of action plan-based interventions through local governments, NGOs, youth, women, private sector, and climate vulnerable communities.
- 2. Low carbon development and climate resilience:** (i) promotion of clean and renewable energies; (ii) implementation of climate screening procedures; (iii) development and implementation of climate-resilient design standards for infrastructures; (iv) identification of sectors and technologies emitting GHGs and options to reduce GHG emissions; (v) regular conduction of energy audit in GHG emission installations; and (vi) promotion of low carbon intensity of development path for accelerated macro and sectoral economic growth.
- 3. Fund generation and utilisation:** (i) vigorously accessing the climate funds; (ii) development and usage of self-financing (in-country) mechanism to address climate change; (iii) promotion of carbon trade such as Clean Development Mechanism and through waste-to-energy conversion; (iv) implementation of “polluter pays” principle and payment for ecosystem services; and (v) estimation of financial needs and economic impacts of shifting to cleaner carbon energy development path.

- 4. Capacity building, people's participation and empowerment:** (i) capacity development at all levels, particularly of local governments, youths, women, indigenous communities, and climate vulnerable communities, and promotion of their participation to address the impacts of climate change; (ii) development of trained personnel for accessing international funding and through CDM project, and/or carbon trade related activities; (iii) implementation of promotional activities such as award and recognition; (iv) preparation, production and dissemination of climate-related data, information, learning and best practices; and (v) introduction of climate change aspects in formal, informal and non-formal education at all levels.
 - 5. Research and development:** (i) identification of climate vulnerable areas and impacts mitigation options; (ii) GLOF study and updating of risk potentials; (iii) documentation of traditional and local knowledge, skill, practices, technologies, and best practices related to climate adaptation; (iv) development of flood (too much water)-and/or drought (too little water)-resistant cereal and cash crops; (v) downscaling and utilisation of climate change models; (vi) identification of technological options to address climate change impacts in different ecological zones; (vii) continued documentation of the impacts of climate change in the Himalayas, glaciers, and natural resources; and (viii) assessment of climate impacts on poor, indigenous, disadvantaged and marginalised people, and development of action plans.
 - 6. Technology development, deployment and transfer:** (i) development and sustained use of clean and green energy-efficient technologies (for mitigation of GHG emissions); and (ii) identification, customisation and utilisation of indigenous climate-friendly technologies.
 - 7. Climate-friendly natural resource management:** (i) integration and implementation of climate concerns while utilising natural resources; (ii) conservation of all kinds forests for promoting carbon sequestration, and utilisation of forest products on sustained-yield basis including through avoiding forest fires; (iii) promotion of REDD and REDD+ approaches (Reducing Emissions from Deforestation and Forest Degradation and Sustainable Management of Forests); and (iv) expansion of broad-leaved forest cover for carbon sequestration.
 - 8. Support mechanisms for policy implementation:** institutions, legal aspects, monitoring and evaluation, and potential risks: (i) establishment of Climate Change Centre for research, capacity building, technology development promotion and coordination, and technical back-stopping; (ii) establishment of separate community and national disaster insurance and crop insurance; (iii) integration of climate change concerns and needs in sectoral policies, legislations, guidelines and other instruments; (iv) allocation of funds for policy and strategy implementation; (v) promotion of public and private sector national and international funding sources; (vi) implementation of capacity building, public awareness and empowerment programmes with active participation of local governments, youths, NGOs and their federations and associations; and (vii) conduction of regular and intermittent indicator-based monitoring and evaluation.
- Intensive adoption of low-carbon growth could be achieved by reducing energy consumption having high carbon intensity. There exist opportunities to expand investment in economic growth with energy use of low emission intensity.

Taking into consideration the ongoing effects of climate change and emerging impacts, the climate change policy should provide space for establishing an institution such as Climate Change Centre that is equipped with technical human resources and modern equipment to address climate concerns in a professional manner. Efforts should be made to strengthen existing institutions from the central to the local levels, and/or establish new ones where necessary. For country-wide activities, the Environment and Energy Section or Unit of each District Development Committee could be considered as an entry point and strengthened to promote the field implementation of climate change activities. Also taking into consideration the finances available globally and Nepal's efficiency to access and spend funds, it is high time that a Trust Fund for climate change be established. The Fund should also be equipped, *inter alia*, with knowledge-based human resources capable of developing proposals, and accessing and disbursing funds. This will contribute toward meeting the specific needs of the climate vulnerable communities, promote sustainable development, and ensure poverty reduction.

Persistent Challenges

Climate change will continue, and people will further realise its visible impacts. Countries having resources and technologies will be able

to avoid or reduce the impacts to acceptable levels, while countries like Nepal will be greatly impacted due to low or non-existent coping capacities and financial and technological resources. There are two sets of broad challenges: (i) GHG emission reductions even by changing the gear of social and economic development; and (ii) internalising low-emission and climate-resilient strategy by changing the direction of development. Opportunities exist, but poor people cannot wait days for a single meal. Nepal has been greatly impacted by climate change and the Nepalese people should benefit from opportunities provided by the climate regime. All this will depend upon development and mobilisation of knowledge-based human resources, and the future course of action.

At the End

The policy for the poor should follow a pro-rich approach. This means that policy focus should be oriented towards making the poor people rich by improving their living condition, and engendering climate-friendly livelihood options for them. The pro-rich approach will also have a positive psychological impact on finding ways to become rich, thus making it one of the most appropriate means of improving the livelihoods of the poor. It would, therefore, be beneficial that our policies have a pro-rich orientation in order to properly address the needs of the poor.

PAPER III

Upland Poverty: Examining Causes, Identifying Solutions

Raj Babu Shrestha¹

1. Poverty in Nepal

Despite some progress in poverty reduction in recent years, Nepal remains one of the poorest countries in the world. Nepal Living Standard Survey (NLSS) II conducted by the Central Bureau of Statistics in 2003/04 shows that 31 percent of the total population lives below the poverty line. Poverty in Nepal is a deeply entrenched and complex phenomenon. About 80 percent of Nepal's population live in rural areas and depend on subsistence farming for their livelihoods. Household food security and poor nutrition are still major concerns in rural areas. Most households have little or no access to basic social services such as primary health care, education, clean drinking water and sanitation services. Small, fragmented subsistence farming is a characteristic of Nepalese agriculture, and the average landholding is only 0.8 hectares. The most vulnerable and marginalized groups are the lowest social castes, indigenous peoples and women (FAO. www.ruralpovertyportal.org).

ity, marginality, isolation, and poverty, which are generally associated with the mountain region, still affect the people of the mountain. Although some 'trickle-down effect' from the growing global economy is evident, Mountain people remain poor with only a limited amelioration of physical hardships in spite of some development of road networks and information technology.

Over half of the populations in the mountain region fall below the poverty line (Table 1). Although incidence of poverty has decreased remarkably over the period, mountain and hills still have higher incidence of poverty compared to the Terai.

Human Development Index (HDI) in the country also varies by ecological belt. On average, mountain dwellers have much lower human development index 0.436 Vs.0.509 as compared to the national average (UNDP, 2009).

Table 1: Poverty Incidence by Geographic Region

	1995-96 (%)	2003-04 (%)	Change (percentage points)
Nepal	41.8	30.8	-11
Ecological Belts			
Mountain	57	32.6	-24.4
Hills	40.7	34.5	-6.2
Terai	40.3	27.6	-2.7

Source: Nepal Living Standards Survey 2003-04.

2. Highland Poverty

According to the 2001 census, around 1.69 million people (7.3 percent of country's total population) live in the mountain region of Nepal. If hills are also considered, the population becomes 11.94 million (nearly 51.58 percent of Nepal's total population). Inaccessibil-

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Human Poverty Index¹, a different measure than income poverty, also indicate that poverty in the mountain is more severe when compared to the national average.

Table 2: Regional Dimensions of Human Poverty in Nepal, 2001 and 2006

Regions	2006	2001
Mountain	43.3	49.1
Hill	32.7	38.8
Tarai	36.9	39.6
Nepal	35.4	39.6

Source: Nepal Human Development Report 2009.

The estimation of a sub-regional Hunger Index for Nepal (NHI²) by WFP, 2009, shows that the Mountain zone ranks the worst in terms of hunger (NHI = 27.9) followed by the Tarai (NHI = 23.1) and Hills (NHI = 21.5) (Table 3).

The high rate of poverty and low poverty reduction rate compared to national levels are a serious concern in terms of increasing inequalities within the country and region. According to ICIMOD (2010a), inequality between mountain communities and those in other areas is increasing. With increasing climate related stress, these inequalities might increase still further. Increasing inequality can foster unsustainable upstream-downstream linkages like increased out migration and pressure on already overburdened urban centers, and structural conflict.

Also, the mountain women face many of the same challenges faced by women throughout the country, but those challenges are further accentuated by altitude, steep terrain and isolation. Women in the Nepalese mountain region have to negotiate the hardships imposed by the mountains, compounded by their pov-

erty and the burden of raising their families. The current trend of migration of a growing number of men to cities in the country or abroad in search of jobs leaves women to carry the burden of maintaining the home and farm alone. Despite their additional responsibilities in maintaining the home and their dependence on farming income, few women are given title to mountain farmland, and fewer still have access to financial credit (<http://www.mountainpartnership.org>). In many of the Nepali societies, women's movements and acquaintances are restricted, preventing them from benefiting from educational and extension opportunities, which help to reduce poverty. The poor condition of mountain women is reflected in their lower Gender Development Index (GDI). Women in the mountains have a lower GDI value (0.363) than those in the hills (0.498) and Tarai (0.450). The magnitude of gender inequality in human development is most pronounced in rural areas of the mountains and the Far Western Development Region (UNICEF, 2006).

The lower value of all these indices in the mountain indicate that chronic and widespread poverty in all its dimensions prevails in a large part of the Nepalese mountains.

Table 3: Sub-regional Hunger Index for Nepal

Ecological Regions	Population undernourished (below 1810 Kcal/person)/day)(%)	Underweight in Children under 5	Child mortality (%)	NHI
Nepal	22.50	38.6)	6.1	22.40
Mountain	28.5	42.4	12.8	27.90
Hill	25.1	33.2	6.2	21.50
Tarai	18.5	42.3	8.5	23.10

¹ Human poverty index takes into account chronic malnourishment among under five children, adult literacy, proportion of population with life expectancy of below 40 years and population without access to safe water.

² Sub-regional Hunger Index for Nepal (NHI) is an adoption of the Global Hunger index which takes into account the percentage of population undernourished, prevalence of underweight in children under the age of five, and mortality rate of children under the age of five.

3. Examining Causes of Mountain Poverty

3.1 Factors of Mountain Poverty

Nepal Human Development Report 2001 identifies the following major factors of poverty in Nepal. However, the report has emphasized that these factors are not all strictly causative. Alternatively, they can be viewed as effects of poverty.

- ◆ Low economic growth
- ◆ Low agricultural productivity
- ◆ Low levels of social and economic infrastructure
- ◆ High population growth and adverse impact on environment
- ◆ Lack of non-agriculture employment opportunities
- ◆ Social and cultural factors
- ◆ Institutional weaknesses at both the government (central and local) and non-government levels, lack of good governance

While talking of mountain poverty, the above factors may not be sufficient. Mountain poverty is intensified by factors such as remoteness, poor accessibility, the fragility of the ecosystems, and marginalization. This complex phenomenon cannot be explained using the existing definitions of poverty. Mountain specificities, such as poor accessibility and marginalization, must be taken into account to fully comprehend the complexity of mountain poverty (ICIMOD, 2010a). Residing uphill to extreme altitudes, many mountain people can barely scratch out a living as they struggle to grow crops on steeply sloped fields with fragile soils and short growing seasons.

In the developing world, mountain communities generally tend to suffer disproportionately from poverty and lower levels of development than those in lowland areas. The prevalence of poor and vulnerable people increases with elevation (Hassan et al., 2005; Huddleston and Ataman, 2003). Poverty in the mountain area

is generally higher than the adjoining areas all around the world. Factors such as uneven distribution and quality of land, poor access to education and health facilities, low level of infrastructure development, and lack of employment opportunities provide possible explanations for such variation. The generally poor access in mountain areas, the complexity and fragility of mountain conditions, and the marginalization of mountain communities from the mainstream, coupled with climate stresses and proneness to natural disasters, contribute to the high levels of income and food poverty (ICIMOD, 2010a). As a result, mountain people are increasingly exposed to growing physical, social, and economic risks and vulnerabilities.

ICIMOD is analyzing the national representative livelihood data to delineate a system to explore and understand mountain poverty as a basis for improving understanding of the triggers of poverty in mountain areas compared to the rest of a country. The analytical framework helps to explain mountain poverty through the interrelations of infrastructural (access to facilities and accessibility) and individual (socioeconomic) characteristics. The indicators relevant for explaining poverty in Nepal, and mountain/plains differences, are summarized in Table 4.

Apart from the factors described in Table 4, there is a need to examine the effects of factors like trends on agriculture productivity, migration, remittance globalization etc. on mountain poverty.

3.2 Agriculture Productivity

Even though an overwhelmingly large proportion of the employed population in Nepal – 79% in Mountain and 66% in Hills – has agriculture as their major occupation (Table 5) and food crop is the main product of the mountain farm, the farmers in the mountain region have not been able to produce enough

to feed themselves. Mountain and hill, together with 51.6 percent of the country's population, produce only 37.2 percent of the country's total available cereal calories (Table 7). According to Huddleston and Ataman, 2003, low productivity in agriculture in mountains can be attributed to environmental constraints such as unfavorable climatic conditions, poor-quality or shallow soils, and sloping terrain. Other factors like lower availability of irrigated land³, poor accessibility to agriculture centre and cooperative shop (Table 4) and lower use of improved variety seeds and chemical fertilizers (Charts 1 and 2) can also be correlated to this lower agricultural productivity in the hills and mountain.

At higher altitudes, where mountain environments are harsh and suitability for agriculture is restricted, pastoralism is the most common livelihood strategy. Pastoral systems, however, are becoming increasingly vulnerable due to population growth and the resulting increasing pressures on the land, the impacts of more frequent and severe droughts, and the breakdown of traditional trade routes and patterns of exchange (Huddleston and Ataman, 2003). Thus, poverty in the mountain region can be related to high dependency on the agriculture sector and lower productivity in the agriculture sector in the mountain region.

3.3 Migration and Remittance

High rate of migration, generally from the mountain and hills to lower altitudes, is a common trend observed in Nepal (Chart 3). International migration for work is another common and growing trend in the country. According to the World Bank (2008), for Nepal, the stock of emigrants was around 750,000 compared to a total population of 28 million. In 2007, remittances constituted almost 20% of GDP of Nepal. However, there is lack of separate data for highland and lowland emigrants. NLSS 2003-04 has depicted that even though the percentage of households receiving remit-

Table 4: Indicators for Determinants of Poverty (ICIMOD, 2010a)

Indicators	Mountains/ Hills	Plains
General poverty indicators		
HH under the food poverty line (%)	38.3	30.5
HH under the non-food poverty line (%)	49.3	31
HH under the total poverty line (%)	40	27.6
Social status		
Dalit HHs (%)	13.1	13.6
Uneducated head of HH (%)	62.4	59
Percentage of literate HH members over 5 years of age (mean)	48.1	44
HH Composition		
HHs with female head (%)	17.7	10.9
Dependency rate (mean)	1.14	1.04
Land ownership		
Land owned by HHs in ha (mean)	0.74	0.77
Number of plots (mean)	3.4	2.3
Number of livestock per head (mean)	2.3	1.2
Percentage of HH members in non-agricultural professions (mean)	54.7	40.8
Access to basic facilities		
Basic Facility Index	-0.16	-0.06
HHs with improved source of drinking water (%)	69.1	89.5
HHs with toilet facilities (%)	40.2	27.8
HHs with electricity (%)	24.5	35.2
Accessibility		
Accessibility Index	-0.36	0.31
Hours to next paved road (mean)	19	1.1
Hours to next market centre (mean)	7.3	1.1
Hours to next bus stop (mean)	13.3	0.6
Hours to next agricultural centre (mean)	6.1	1
Hours to next cooperative (mean)	8.1	1
Hours to next bank (mean)	10.1	1.4

Source: ICIMOD, 2010a.

Table 5: Percentage Distribution of Usually Economically Active Population by Major Occupation for Ecological Region, 2001

Major Occupation	Mountain	Hill	Tarai
Agriculture	78.48	65.91	49.15
Non-Agriculture	21.51	34.06	50.81

Source: (CBS 2003) Population Monograph of Nepal.

tance is similar in all ecological regions, the average amount of remittance among mountain household recipients is nearly Rs. 10,000 less than the households of the hills and Tarai (Table 8). The higher proportion of remittance received by mountain households as internal

³ The percentage of irrigated land according to NLSS 03/04 is 44% in the mountains, 36.8% percent in the hills and 68.6% in the Tarai.

Table 6: Basic Crops – their Production and Yield in Nepal (5-Year Average Production 1997/98-2001/02)

Crop	Mountain		Hill		Tarai	
	Total (Mt.)	Yield (Mt./per ha)	Total (Mt.)	Yield (Mt./per ha)	Total (Mt.)	Yield (Mt./per ha)
Barley	13408	1.08	16639	1.16	1556	1.12
Maize	119436	1.41	983619	1.72	335081	2
Millet	55390	1.06	218878	1.11	13089	1.21
Paddy	91119	1.54	894390	2.36	2964724	2.63
Wheat	62746	1.3	381445	1.58	692996	1.97
Potato	197650	3.37	550964	9.56	450249	9.65
Total	539749	1.71	3045934	2.08	4457695	2.61

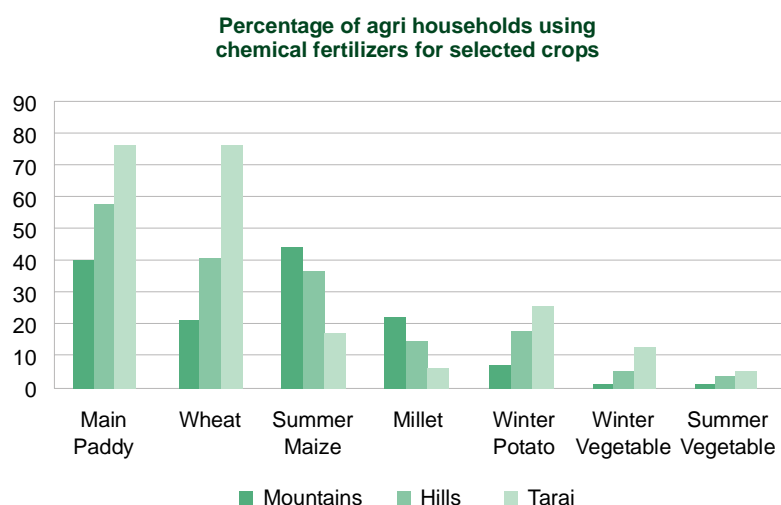
Source: (CBS 2003) Population Monograph of Nepal.

Table 7: Population Distribution Vs Availability of Cereal Calorie by Ecological Zones

Region	Population (%)	Available Cal (%)
Mountain	7.3	5.6
Hill	44.3	31.5
Tarai	48.4	62.9
Total	100	100

Source: (CBS 2003) Population Monograph of Nepal.

Chart 1: Agri Household using Chemical Fertilizers for Selected Crops by Ecological Region



remittance should be the main reason for it (Chart 4).

The effects of migration on mountains may include prosperity through social and economic remittance and reduction of the dependency on the fragile mountain ecosystem. However, out migration may also cause depopulation and the degradation of hill slopes (DE Veliegher, 1993). Migration of able-bodied people from a region can lead to serious social problems and a missing labour force, thus reducing the overall productivity of the region. The Nepalese economy has begun to rely even more heavily on remittances, as the remittance-receiving households move in increasing numbers from rural hamlets to market towns and urban centers. Studies show that with the increased role of remittances, income inequality may increase and economies expose themselves to increased vulnerability. The data (Table 8) shows that highland people have not been able to benefit from remittance compared to people of lower land.

3.4 Climate Changes and Mountain Poverty

The impression that soil erosion in the mountains is a major cause of poverty and environmental degradation, held before the onset of the 21st century, is changing. Now, global warming and climate change add a new dimension to our understanding of environmental and related issues of mountain poverty. It is said that global warming will affect mountain areas quicker and faster than the plains (ICIMOD, 2008).

Nepal is among the most vulnerable countries to climate change since the annual mean temperature growth (0.06° C) is at least six times higher than the global average. Between 1977 and 1994, average warming in annual temperature was 0.06° C per year (Shrestha et al., 1999). Warming was much pronounced in the high

altitude regions of Nepal such as the middle mountain and the high Himalaya, while warming was significantly lower in the Tarai and Siwalik regions. According to a recent study, Nepal's temperature is rising by about 0.41° C per decade (Dahal, 2005; Kansakar et al., 2004; Shrestha et al., 2000). The summary of climate trend projections through the General Climate Model shows that mean annual temperature across Nepal is projected to increase by 3 to 6.3° C with a multi modal mean of 4.7° C by 2090, while mean annual precipitation is projected to show a variation of -43 to +80 %, with a mean of +8%, by the 2090s. (NCVST, 2009).

Poverty and resource degradation issues are already serious in the mountain areas, and global warming will further accentuate this. There are already indications of less rain, changes in past annual weather patterns, a serious drying up of hill springs, proliferation of vector related diseases of warmer regions like malaria and Japanese Encephalitis, changes in horticultural zones, and receding glaciers and associated GLOFs.

Climatic variability such as change in precipitation intensity and frequency can trigger natural disaster events such as landslides, flash floods, soil erosion, drought, and so on. The loss of top fertile soil due to soil erosion, landslide and floods coupled with the negative effects of climate change, may adversely reduce agricultural production. Disturbances in natural rainfall pattern caused by climate change will be responsible for enhanced food insecurity. Global warming may cause forest damage by causing changes in their composition and extinction of species. This would affect not only the vast biodiversity of mountains but also the livelihoods of a majority of people who derive fuel, food, fodder, timber and medicines from forests. The aforementioned impacts of climate change will certainly exacerbate the problem of mountain poverty if not addressed early.

Table 8: Remittance Received by Households of Various Ecological Regions

Ecological Region	Percent of HHs receiving remittance	Average amount of remittance among recipients (Rs.)	Average per capita remittance (Rs.)
Mountains	31.4	25,583	1,588
Hills	31.9	35,289	2,292
Tarai	32.1	35,533	2,012

Source: NLSS, 2003-04.

Chart 2: Agri Households using Improved Seed for Selected Crops by Ecological Region

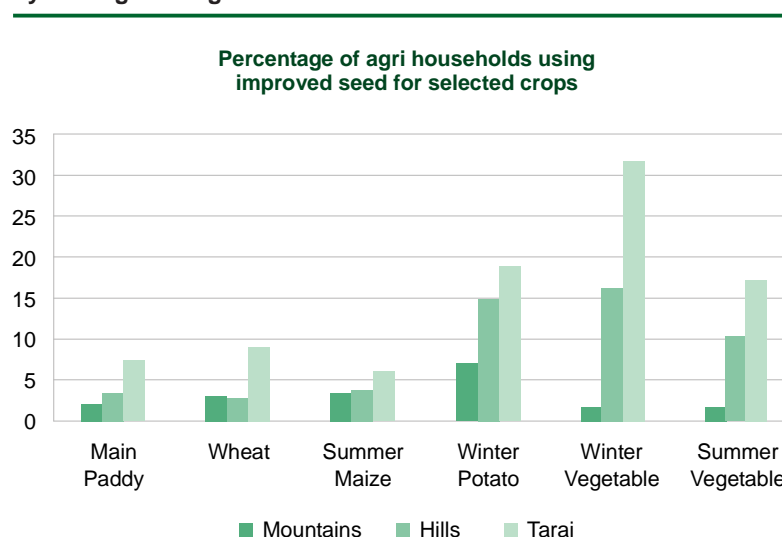
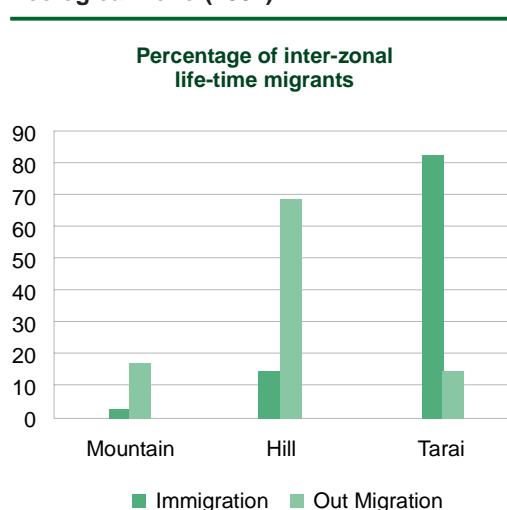
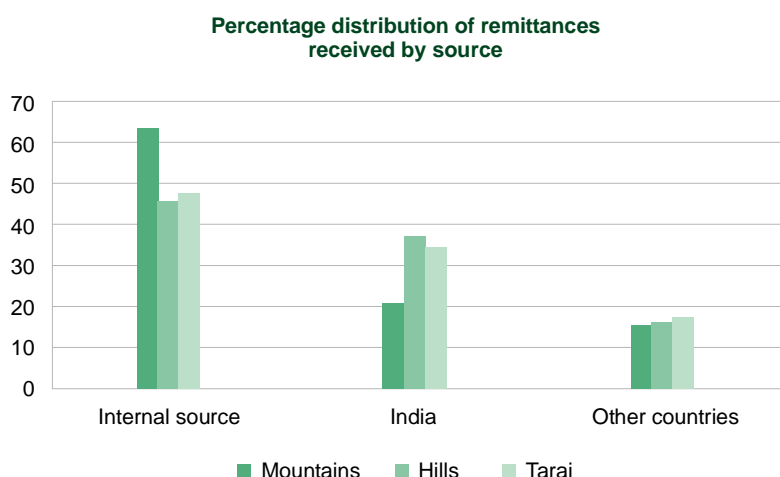


Chart 3: Migration across Various Ecological Zone (2001)



Source: CBS 2003.

Chart 4: Distribution of Remittance Received by Source



Source: NLSS 2003/04.

Climate change in the mountain is threatening sustainable development, especially poverty alleviation. The mountain poor will face more serious impacts in the future due to the likelihood of more and more frequent occurrences of extreme events, and their economic development prospects are increasingly facing risks (Macchi M.; ICIMOD, 2010).

In its fourth assessment report, the Intergovernmental Panel on Climate Change (IPCC) depicts the Hindukush-Himalaya, as a “white spot”, a region about which scientific information on climate change is limited or lacking altogether. This lack of information at a regional scale hinders proper planning and decision-making. There is dearth of scientific information on the trends in key indicators related to temperature, melting of snow, water availability, environment, hydrology, meteorology, and adaptation to climate change. However, some documents have started to become available regarding perception on climate changes and observations made at the local level by the mountain community. Often, observation documented at the local level can detect criti-

cal change patterns long before they can be quantitatively documented through formal scientific research. For the meantime, until hard-facts science produces a concrete result on climate trend and its possible effects, our mitigation and adaptation planning against climate change should give due emphasis on these observations made by the local community.

3.4.1 Community Observation and Experience on Current Trends of Climate Change.

The Nepal Climate and Vulnerability Study team organized three consultative meetings – one each in Biratnagar, Pokhara and Nepalgunj in 2009 – with the grassroots representatives from across nine geophysical and hydrological regions of the country. The summary of their experience and observations on gradual changes in climate and their effects, including their impact on local hydrology and agriculture, was as follows:

- ◆ Rhododendron, *chanp*, and *katus* are flowering/blossoming earlier as compared to the previous years. Apples are affected by insects (unusual) and hail. The elevation for growing apple moved to higher altitude. Decrease in production of crops. Fast maturity of crops/plants is experienced. Local agriculture calendar is changing.
- ◆ Snowline is shifting higher than ten years ago. Decreasing winter snowfall has resulted in less moisture and fodder growth in pastures. New types of plant and animal diseases were seen, migrating plants are choking local vegetation.
- ◆ Unusual hailstorm and variability has occurred in winter snowfall (late snowfall).
- ◆ Rainfall is turning erratic, drought period is increasing. Water for irrigation is declining. Drying of spring sources is becoming more common. Landslide and bank cutting is increasing in the hills. Frequency of flash floods increased in the Chure area. Inundation and sediment casting increased in the lower Tarai.

- ◆ Episodes of fire are increasing, thus decreasing forests and pasture areas.
- ◆ Warming temperatures have hampered yak-rearing in the mountains. Increase in mosquito infestation in the upper region.
- ◆ Reliability of traditional and indigenous knowledge about climate and plants is declining, and historical conditions can no longer serve as a guide to the future.

SAGUN, 2009, ICIMOD, 2010b, and Oxfam, 2009, indicate similar experience of local communities regarding climate change.

In the mountains, the livelihood sources of the poor are usually narrower and more climate-sensitive than those of the non-poor. Poor people are particularly vulnerable to deviations from average climatic conditions such as prolonged drought, and to natural disasters such as landslides. In periods of stress, they may be forced to sell off their physical assets such as land and livestock, thereby undermining the sustainability of their livelihoods over the longer term. Among the poor, vulnerability varies since some groups like women and dalits are more lacking in the financial, social, and political means of securing alternative livelihoods less exposed to risk than others. Women, for example, may be constrained by social and cultural structures that place them in inferior social positions, limiting their access to income, education, public voice, and survival mechanisms. In addition, the coping capacities of the poor are often already strained due to a number of trends, including increasing population densities, occupancy in natural hazard prone areas etc. Climate change will add to these trends and increase vulnerabilities.

Although chronic and widespread poverty in all its dimensions prevails in the mountains, there is a clear lack of the knowledge needed to fully understand poverty from a mountain perspective, and the reason for the disparities that exist between the mountain and hill ar-

eas and the rest of the country. Hence, we should take more effort to understand mountain poverty by integrating indicators such as inaccessibility and marginality into the poverty analysis. Development of a regional analytical framework to describe mountain poverty should be helpful to understand mountain poverty.

3.4.2 Environment, Poverty and Climate Safeguard Measures Adopted by Upland People

Poor people are experts at coping with and adapting to prevailing circumstances, and they use a variety of strategies and types of knowledge in order to attempt to cover their basic needs and live a decent life. Mountain communities have been using traditional methods of adaptation for generations based on local knowledge and innovations. The following examples show how mountain communities are coping with climate changes and adapting to it.

- ◆ In Ramche of Rasuwa District, communities changed their cropping patterns, i.e. cultivation of potato and maize one month earlier than before (SAGUN, 2009)
- ◆ Some communities are trying to adapt to the warmer winters and erratic rainfall by growing different crops, such as vegetables, instead of rice and wheat that need more water (OXFAM, 2009). In Deupuje of Dhading District, there were also changes in cropping pattern by replacement with less water-requiring crops such as finger millet, lentil, mustard and tomato (SAGUN, 2009)
- ◆ People are starting to harvest rainwater and re-use water. Simple practices such as building small ponds or installing rainwater tanks to collect rainwater for consumption and to irrigate kitchen gardens are becoming increasingly popular, as are steps to improve the re-charge of water sources through construction of check dams and reforestation catchment areas (OXFAM, 2009).

- ◆ Employment pattern have also changed due to climatic hazards. Decline in productivity in Dhunche area caused many local people to shift their occupation to tourism, hotel and other services (SAGUN, 2009)
- ◆ In response to degradation of the grassland and shortage of fodder and forage, farmers in the highlands have reduced livestock numbers, larger ruminants have been replaced by smaller ruminants like goats (ICIMOD, 2010c).
- ◆ To cope with the variability in rainfall, communities are developing innovative methods such as sprinkling water on coffee trees in dry seasons to induce flowering. To cope with the drought, potatoes were grown in rows so that less amount of water is required. Some farmers are spraying ashes in the periphery of nurseries to control ant attacks (Kirsten et al., 2008)
- ◆ Community people have suggested the need to earn incomes independently of farming by being involved in professions such as tailoring, pot-making, basket-weaving and other cottage industries to cope with declining agriculture output. Income diversification is suggested as a key livelihood strategy and coping measure. In some areas, simple savings and credit schemes have provided the opportunity for poor people to build their livelihood assets such as through rearing of goats. Other people have used credit for planting other crops that can diversify their income. (Kirsten et al., 2008)

However, local strategies and knowledge have their limitations and are not sufficient for reducing poverty due to a range of constraints and structural barriers that contribute to maintained poverty. In addition, existing strategies and knowledge may have limitations under circumstances of increasing climatic changes occurring in parallel with factors such as rapid demographic and socio-economic changes, loss of biodiversity, soil degradation and in-

creasing water scarcity (Nass, 2005). New, relevant knowledge can be added to existing knowledge; the options for income-generating strategies can be strengthened and widened, and the barriers for such strategies can be identified and addressed. Hence, autonomous adaptation measures undertaken by mountain communities should be supplemented by planned adaptation involving programs and projects from governments, NGOs, and international donors.

3.4.3 National Policy Responses to Climate Change

Nepal responded to climate change by signing the UN Framework Convention for Climate Change (UNFCCC) in June 1992. UNFCCC entered into force in Nepal in July 1994. Nepal is preparing the National Climate Change Policy. The Ministry of Environment is implementing NAPA (National Adaptation Programme for Action) Project for the preparation of a National Adaptation Programme of Action to address climate change. Nepal participated at COP15 and associated with the COP15 Accord with Reservations. The GoN, in consultation with various regional and global stakeholders including the Mountain Partnership, initiated and launched the Mountain Alliance initiative for climate change (endorsed by GoN in May 2010). There are other national initiatives like the Pilot Programme on Climate Resilience (PPCR) and Reducing Emissions from Deforestation in Developing Countries (REDD).

Although the government, realizing the brunt of climate change in Nepal, has responded in a positive direction, its current effort to address the problems of climate change has been slow and inadequate. Although the climate change risks are noted by the GoN and donors, they currently have a relatively low priority due to the ongoing peace and democratization process and overall post-conflict situation (DANIDA, 2008).

4. Solutions to Highland Poverty: Climate Responsive Sustainable Development

As described earlier in this document, poverty is widespread and deep rooted in the mountain community, and the ongoing phenomenon of climate change is dampening the efforts to overcome it. In this section, firstly, the focus will be given to the mitigation and adaptation issues of climate changes, especially the response of mountain people and suggestions for the planned coping measures. The focus will then be shifted to how overall poverty reduction can be achieved in the mountains.

4.1. Dealing with the Climate Change Issue

Mitigation of climate change includes policies and development actions that reduce the emissions of carbon dioxide (CO₂) and other Green House Gases (GHGs). Options for GHG mitigation in Nepal include:

- ◆ Support to low-emission development paths, e.g. through energy efficiency, investments in renewable energy and technology transfer
- ◆ Protecting and enhancing carbon sinks in forests and agriculture as a by-product of sustainable forest and land-use management

The population of Nepal is less than 0.4% of the world, and is responsible for only about 0.025% of annual greenhouse gas emissions (NAPA/MOE, 2009). Hence, it is unlikely that Nepal will have to spend much resources in implementing the mitigation measures. However, there are also opportunities for Nepal to access international funds through international mechanisms such as CDM (Clean Development Mechanism) and REDD (Reducing Emissions from Deforestation and Degradation) by undertaking mitigation efforts. This potential can be realized especially by invest-

ing in renewable energy, and protecting and enhancing carbon.

On the other hand, the mitigation measures described above will take very long (about 100 years) to respond properly to climate change. However, implications of the climate changes to the fragile mountain ecosystem, fresh water, and extreme weather events, agriculture, human health and others could be serious problem for Nepal if not addressed promptly. Therefore, for Nepal, adaptation measures are more important in order to adjust during this longer-term period.

Adapting to climate changes is possible – at least for the present – and there may even be advantages in high mountains where growing seasons are extended, or new crops can be grown. Adaptation, however, requires information and resources. In shortage of both these assets, the poorest communities are the most vulnerable to climate changes and have the least resources to cope, mitigate, recover and adapt. Adaptation is more difficult in the mountains as adaptation here will be location specific and needs to be tailored to local conditions (e.g. impact of climate change on mountain valley may be different from that of mountain ridge only a few km above due to which adaptation measures may vary considerably). Hence, blanket measures for the entire mountain region will not work. The challenge is thus to develop tailor-made adaptation measures for the mountain communities of Nepal.

Suggestions to Tackle

Climate Change – Planned Adaptation

Very little has been achieved so far in supporting vulnerable communities facing the brunt of climate change towards planned adaptation. There is a need to build capacity at all levels, and engage with research partners to come up with the tools and technologies that can benefit the rural poor in terms of mitigation and adaptation to climate change.

As indicated earlier, there is a lack of climate change related information, which has created difficulty in proper planning and decision making. The scientific world and particularly Nepal should play a significant role in reducing the scientific uncertainties by creating country-wide databases on different aspects of the mountain, and tracking the trends in key indicators related to temperature, melting of snow, water availability, environment, and adaptation to climate change. However, until the result of high science produce robust results useful for development planning, the impacts of climate change observations made at the local level should be documented and utilized to predict the impacts, and devise adaptive and mitigation measures.

Appropriate technologies, suitable for the local context, need to be developed and disseminated to the community people. Adaptation measures such as crop diversification, crop and livestock insurance and risk transfer mechanisms should be developed to minimize the risk of climate change.

Adaptation activities should be based on sufficient understanding of local livelihood strategies and contexts, poor people's problems, efforts, values and aims, and how these relate to local climate variability and change. Blending traditional practices with modern science for improving knowledge on natural resource management like (rain water harvesting, soil nutrient and water management, forest management), crop and livelihood diversification, use of stress tolerant crop varieties, participatory seed selection, seeds bank and exchange etc., provides one way of coping with different climatic variability.

Empowering communities with information, technological skills, education and employment is the best way to address vulnerability. A location-wise action-research is therefore necessary to identify and document climate change impacts and adaptation strategy.

Information flow on impacts of climate change and methods to cope with or adapt to them should be disseminated to the community through effective knowledge management and sharing. School curricula, social mobilization process, and agricultural extension services can be used to provide crucial knowledge for local food security and livelihood options, including marketing, micro enterprises training and technical training. Proper dissemination of experiences achieved so far, with sustainable development efforts, increases the options for the poor in choosing different solutions for adaptation and climate resilience.

Climate change adaptation should be carried out as part of broader development measures and not as isolated climate adaptation policies or projects. Hence, the climate change component should be integrated in all policies and projects involving its stake.

Due to the uncertainty of future climate changes and the increased variability and unpredictability of weather patterns, future activities for sustainable development and adaptation should not respond only to specific types of climatic events. Rather, they need to be developed with regard to their potential to increase resilience towards a variable climate as well as economic, political and other stresses affecting local communities. The activities and strategies should contribute to increased resilience and reduced vulnerability.

Importantly, the poorest and women in particular are the least able to adapt as they lack the resources to undertake new activities, the mobility and confidence to seek information, and the time and energy to take on more hard labour. Hence, programmes should be targeted to provide them all kinds of financial and capacity related support. As they have very limited resources, with only simple and appropriate mechanism for financial services and risk insurance processes in place, the poorest of the poor can venture on the process towards climate change adaptation.

4.2 Recommendation for Reducing Mountain Poverty

Sustainable poverty reduction in the mountain region will be achieved through: (i) job generation and increased incomes resulting from faster and broad-based pro-poor economic growth; (ii) equitable improvements in basic social services to enhance human development; and (iii) good governance. In addition, poverty can be reduced in more efficient ways if the climate aspect is taken into account (elaborated in section 4.5). The following measures can be undertaken to achieve this:

1. Investment on Priority Sectors for Economic Growth

Increased economic growth in the mountain is urgently required to combat poverty. Economic growth, preferably through increased investments in potential sectors like agriculture, water resources, biodiversity and tourism, however, are not sufficient. Realizing this, Nepal should promote and provide a supportive and enabling environment for investment towards improved management of water resources; ecosystem services such as biodiversity, forest, rangelands, and watersheds; and livelihood sources such as high quality mountain niche products (for example, honeybees and medicinal plants) and services (for example, tourism and clean energy) to achieve a quick and lasting impact on the livelihoods of the poor and marginalized people of the mountains. To achieve this, investment should be focused on infrastructure building, especially roads, telecommunications, electricity and irrigation facilities, and providing educational and agriculture research and extension services to the community. Out of the infrastructure expenses, road has the highest rate of return (Kandel, 2006). Rural road networks offer new opportunities and prospects for socio-economic development in rural and remote areas.

All these priority sectors of the mountain region are vulnerable to climate change because of which this aspect should be given due attention while investment is being made.

2. Public-Private Partnership

Internal resource mobilization should be improved to reduce donor-dependency and harness public-private complementarities in promoting sustainable mountain development. While focusing on the priority areas mentioned above, Public Private Partnership should give priority to encouraging and enabling the private sector to undertake such services and facility which it will not undertake simply based on market forces and mechanisms. Environment should be created for more active involvement by the private sector in all parts of the value chain for high-quality mountain products like Production, Collection, Grading, Storage, Processing, Packaging and Marketing.

3. Mountain Specific Approach

Nepal should formulate and implement national strategies and programmes for sustainable mountain development. Because of specific characteristic of the mountain environment, traditional blanket approach of development will not work for the mountain region. To achieve mountain-tailored development, central emphasis should be maintained on the mountain context and the imperatives of mountain specificities as outlined in the Mountain Perspective Framework⁴ while addressing complex issues with knowledge and anticipatory or forward planning. Effort should be made to ensure that mountain issues are more effectively mainstreamed and that they receive high priority within development agendas and processes dealing with poverty reduction, food security, climate change and other issues that are critical to sustainable development in the mountain areas.

⁴ Mountain Perspective Framework (MPF), implies definition, recognition, understanding, and adoption of the landscape specific status and imperatives of mountain conditions (mountain specificities) such as a high degree of inaccessibility, fragility, marginality, diversity, niche opportunities, and human adaptations, and takes these into account when designing and implementing interventions in hill and mountain areas.

4. Rewards for Services Provided by Mountain Communities

Mountain people, through their still predominantly sustainable land management practices, provide a number of positive externalities including (agro-) biodiversity conservation; carbon sequestration and climate mitigation; soil protection and preservation; water/watershed management; protection from and prevention of natural hazards (e.g., avalanches, floods); and preservation of cultural and natural landscapes for recreation (FAO 2009). Payment for environmental services is one way to reward mountain communities for the vital services they provide. So far, there are only a few examples of mountain people being rewarded for such services, in part because there is a lack of public awareness and a lack of methodology for such valuation. Effort to develop a system to provide an estimated economic value for these services should be made. The government should facilitate the promotion of payments for the environmental services provided by the mountains with a view to protecting these services as well as enhancing the livelihoods of the poor mountain communities.

5. Fostering Community Centered Initiatives

Community-centered initiatives should be facilitated and supported and partnerships should be developed with a focus on community-owned resources and indigenous knowledge systems. Traditional institutions and community groups such as Mothers' group, Community Forest User groups, Buffer zone User Groups, Community Managed Cooperatives, Vegetable farmers' group should be strengthened through supportive education, extension and capacity-building programmes to further sustainable mountain development at all levels.

6. Inclusion and Local Values

The role of mountain women, Dalits, minorities and unprivileged people in planning and

decision-making processes that affect their communities, cultures, livelihoods and environments should be strengthened. These groups are the most vulnerable to the effects of climate change. Through more effective engagement of all stakeholders in the decision-making process, it should be ensured that indigenous cultures, traditions and knowledge are fully recognized and included in development policy and planning in the mountain region and that access and agreed-to rights to land and natural resources are respected. Higher priority should be given to human resource development, equity and women's issues to reduce poverty and make development more inclusive and sustainable.

7. Balancing Upstream-Downstream Concerns

As access to mountain regions increases, the potential for exploitation of mountain people and mountain resources also increases. Putting power back into the hands of the mountain people, and advocating policies and practices that ensure equitable access to and distribution of the benefits from mountain rangeland, water, forests and mining are important steps towards alleviating poverty in mountain communities and, in turn, protecting mountain resources. Effective and equitable market links (especially with the lowland economy) should be developed to ensure development gains for mountain people. Hence, balance should be found between upstream-downstream concerns focusing on balanced regional development and the interdependence of each region and community.

8. Short-Term Relief Projects

Policies and programmes should always be in place to adequately and urgently respond to problems like severe food deficit, disease epidemics, and related challenges for mountain communities, which are often among those most severely affected.

9. Targeted Programmes

Large inequalities still exist between various groups and communities in Nepal. Hence, special targeted attempts are required to empower the poorest, most marginalized and unprivileged groups like Women, Dalits, Indigenous People and the most unprivileged who have, in the past, been excluded from many of the opportunities and social networking activities available to more powerful groups. Targeted program are very much required to improve their access to resources so that they can improve their livelihood and participate in the sustainable development of the country. Hence, poor targeted programmes like Poverty Alleviation Fund (PAF) should be promoted in addressing poverty in the mountain region. In this approach, direct identification of poor households is done through the participatory well-being ranking at settlement level by the communities themselves. Then the identified communities are organized in the form of community organizations (COs), their capacity is built and they are supported through the mechanism of direct funding and demand driven approach in Income Generating and Infrastructure activities so they can sustainability come out of the poverty trap. Experiences with PAF so far have shown that targeted programmes like PAF will be very effective in reducing poverty (Refer Box 1). Investment on such programmes should, therefore, be increased.

10. Institution Governance and Partnership

Institutions should be reformed to enhance local participation in policy-making/implementation, implying genuine decentralization. The political and economic fate of Nepal lies in the crucial new linkage between political parties and local people in all forms of government. Non-political NGOs and self-help organizations can help to provide effective links. Interactions between stakeholders at different levels should be balanced to better balance top-down and bottom-up ap-

proaches and processes required to promote sustainable development of the mountain community.

The collaborative efforts of the Mountain Partnership should be supported, and the active involvement of relevant government, civil society, and, in particular, private sector institutions at the regional and national levels should be fostered. Mutual sharing and systematic synthesis of past development/policy intervention experiences can be very useful in building the future approaches for poverty reduction and sustainable mountain development.

Establishment of regional mechanisms should be promoted for coordinated trans-boundary cooperation for sustainable mountain development and strengthening existing mechanisms like the Alpine Convention and the Carpathian Convention, and learning opportunities should be exchanged between them. The Mountain Alliance initiative for climate change launched by the GoN in consultation with various regional and global stakeholders, including the Mountain Partnership initiative, is a welcome move.

11. Poverty and Climate Change in Nepal's Planning

A review of various Governmental Plans and Policy documents suggests that at the national level, the impact of climate change on poverty and the actions needed to deal with it have not been properly embedded into policy and planning processes. Climate change has been directly addressed in periodic plans only in the Interim Plan (2008 -2010), which has mentioned priorities, policies and strategies related to climate change in the development agenda. The coming Three Year Plan should be one step further in formulating a plan responsive to the climate change scenario, especially with focus on the poor of the mountain region who are the most vulnerable to it. The National Planning Commission (NPC) has initiated the Cli-

mate Resilience Planning Process with support from ADB Technical Assistance for the upcoming Plan (*Ghimire P., 2010*). The Poverty-Environment Initiative (PEI) in Nepal with support from UNDP and UNEP is also facilitating the NPC in the integration of pro-poor environ-

mental considerations in this key national development planning process. Hence, there is hope that climate change and mountain poverty related issue will get good priority in the forthcoming periodic plan and other governmental policies.

Box 1 PAF in Mountain Poverty Reduction

PAF is currently implementing its regular program in 40 districts of the country. Out of the 40 districts, its program was launched in 15 districts only in the 2nd quarter of the last fiscal year. Hence, not many households in these districts have been covered by PAF. Regarding the older 25 districts with more than 4 years with PAF, coverage of poor households has been massive, especially in the mountain/hill region (Table below).

Table: Number of PAF's CO member households Vs Total district households in the 25 districts covered by PAF

Region	Total HHs in Districts	CO Members	% of HHs with CO membership
Mountain/Hill (20 districts)	516472	281171	54.4
Tarai (5 districts)	465153	121934	26.2
Total (25 districts)	981625	403105	41.1

Independent studies have confirmed that PAF is well on track to mobilize the poor to unleash their potentials. A World Bank commissioned preliminary evaluation has indicated a good rate of return on PAF investments, ranging from 20-25 percent. Annual per capita incomes for beneficiary families have increased by 10-15 percent. The first ever impact assessment study, conducted by the Central Department of Population Studies, TU, covering 1,755 households (120 household from

control districts) has established that PAF, over the four years of its presence, improved the economic status of the poor, facilitated social integration of excluded communities and enhanced underprivileged communities' capacity, creating a base whereby they can evict themselves out of the poverty trap.

- ◆ PAF program spurred rise in income of its beneficiaries by 19 percent and increased their consumption by 23 percent, whereas people in similarly impoverished districts lacking PAF intervention recorded marginal growth on these fronts
- ◆ Agriculture as the main occupation gradually shifted toward other occupations – thanks to PAF – as it opened new income generating avenues for the poor
- ◆ Under-five child mortality rate in the district where PAF launched its program in 2004 was also found to have dropped by 57 percent in 2009
- ◆ The number of people visiting government health facilities for treatment increased by 10 percent over this period
- ◆ Literacy rates for excluded, marginalized and female population increased in 2009 compared to 2006 in PAF program districts
- ◆ Proportion of the schooling population (five years and above) also increased, and the proportion of primary schooling decreased with increase in higher classes
- ◆ PAF program increased school enrollment of children in the communities by 4 percent, whereas districts of similar status wherein PAF is absent showed gradual rise in drop out rates

Economic Analysis of Local Government Investments in Rural Roads: Reducing Poverty through Managing Climate and Environment Risks

Dr. Govind P. Koirala¹

Context

Roads are invariably the priority investments of the local bodies in Nepal. This is because the roads, if operational, will open a multitude of opportunities to enhance the local livelihoods. In the past, the local bodies used to transfer budgets from other heads to road construction, but this practice has now been stopped as other sectors have also become vigilant. Historically, the rural communities created local roads and other necessary infrastructure using voluntary and paid local labour. After the re-establishment of multi-party democracy, heavy equipment such as dozers, excavators, etc. began to be used as more resources, and authorities were channeled through the local bodies. Thus, there essentially are two broad technology groups – i) labour-based and ii) heavy equipment based. In the former, no heavy equipment is used in construction and maintenance, while in the latter, most works are done using heavy equipment. In between, there is a continuum of As of 2008, rural road length in Nepal totaled more than 20,000 kilometers of which about 3,000 kilometers are constructed following the Green Roads approach.

However, in the quest for quick road connection, the use of unsustainable methods began to be used. Because of the deliberate or forced/influenced choice of inappropriate technologies and construction timing, sustainability of

most rural transport infrastructure has become questionable as are the social and poverty impacts from rural roads. Although heavy machines have no fault of their own, most unsustainable rural roads in Nepal are associated with the use of heavy equipment.

Unsustainable roads are those which have one or more of the following – i) high gradient; ii) no protection structures in the critical spells; iii) no biological protection; iv) no water draining arrangements; v) not planned and part of the DTMP; vi) no prior alignment plan and largely left to the equipment driver; vii) no existence of O&M fund, etc. The country should design and effectively enforce the local road standards which avoid the above situations leading to unsustainable roads. In the case of Nepal, the above unsustainable conditions have strong correlation with the unplanned and non-engineered roads that have been built without prior feasibility and environmental studies and which generally use heavy equipment based technologies.

Unsustainable roads have one or more of the following characteristics: Road lengths are unduly increased at the cost of forests and trees and resources in order to avoid agricultural lands. The tremor of heavy machine, together with rock blasting materials, affects the surrounding geological formations and hill slopes leading to destabilization. Cut-throw method is used causing heavy mass wasting and in-

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creasing the probability of landslides. Deuja (1994) estimates that 400-700 cubic meters of landslide occurs per kilometer per year along the mountain roads, and 3,000 to 9,000 cubic meters of landslide occurs per kilometer during the construction of mountain roads in Nepal. The area damaged by the thrown material is much higher than the area actually covered by the road, about three times more than the land occupied by the road. Faulty road construction has been one of the principal reasons for deforestation and forest degradation, contributing to 18 percent of the total greenhouse gas (GHG) emissions in developing countries (Stern, 2006).

In the context of global warming induced climate change, rainfall in the country is expected to be increasingly intense and hence, the unsustainable roads are likely to cause increasingly more environmental damages.

Heavy equipment is imported and use imported fuel. This drains the poor country's precious foreign exchange resources. Since no local labourers are used, there is neither the local poverty reduction effect nor the much required local ownership of the road.

However, as the study has shown, heavy equipment use reduces the time and cost of road construction and maintenance. When these machines are used in i) road widening, ii) ridge alignments, and iii) long unmanned alignments that require labour camping under the LB methodology, then the negative environmental effects are also minimised. The use of breaker attachment with excavator is particularly useful in breaking very hard rocks within one to two hours which would otherwise take months with chisel cutting by skilled human labour. Much of the negative effects of heavy equipment use in rural road construction owes to the negative local practices and the roads not complemented by water management structures (side and cross drains), other pro-

tection structures and bio-engineering works in critical areas.

In many countries, studies have been carried out to evaluate the technologies and practices for suggesting appropriate technologies for rural road construction. In Nepal, no such study had been done to evaluate the alternative technologies and processes in rural infrastructure. Hence, a study was commissioned by LGCDP/UNDP with the objective of carrying out an evaluation of the alternative technologies and processes deployed in rural road construction/rehabilitation, operation and maintenance in selected districts of Nepal so as to suggest and effectively disseminate the right technologies and processes not only for cost-effectiveness but also for sustainability and poverty reduction.

Factors that Favour the Choice of Improper Method and Time

There are several situations in Nepal that have tilted the road construction technology choice in favour of heavy equipment use. These are:

- ◆ Late disbursement of budgetary grant funds to local bodies (usually in May-June) when i) local people are busy in agricultural operations; ii) there is very limited time (less than 2 months) to complete the work within the fiscal year end after which the budget is frozen.
- ◆ Price trends in the last 15 years – heavy equipment rental cost (excluding fuel, transportation and operator allowances) decreasing from about Rs. 3,500 per hour to less than Rs. 1,800 now in contrast to labour wage rate (unskilled), which has increased by almost 3 times. The cost of heavy equipment in real terms is also decreasing over time which, together with the increased supply (competitive), has allowed for reduction in the rental cost of equipment.

- ◆ Local people want roads built quickly. Road opening is generally faster using heavy equipment compared to using labour.
- ◆ Opportunities for rent seeking is higher in unplanned heavy equipment based roads. The common financial abuse nowadays is to use heavy equipment that costs around Rs. 5,000 per hour (rent, diesel, driver), but prepare a fake muster roll of human labour use, which will be about 2.5 to 3 times the cost of equipment use. A system of genuine public audit would have discouraged this practice, but there appears to be conjoined interest of local stakeholders not to let the public audit happen. This practice is also bolstered by the current budgetary process and the severe lack of technical persons within the local body structure.

Study Method

The study started with the review of relevant materials. A total of 6 roads were selected of which the financial and economic return analysis was done for 5 roads only as there were no vehicles plying on the sixth road. Data was collected from the local bodies, construction contractors, and from the user committees and general beneficiaries using FGD tool. The roads selected for the study is presented in Table 1.

In a small sample study, it is useful to take a single road which uses both technologies – but separately at different sections, for comparability purpose. The problem is that both road sections share the same benefit. The difference is that the EB section of the road required higher maintenance cost and had more frequent vehicle blockages than LB roads. In the case of road 1, the potential benefit from LB road may not have been fully realized because the EB road precedes the LB road, and the EB road's limitations may have affected the LB road's performance. In the case of roads 4 and 5, the case is reverse with the LB road preceding the EB road.

So, the analysis of this situation for comparison purpose could be more appropriate. This is a methodological question, and the methodology for the comparative study of these types of roads should be refined in future studies. Because of such situations, it was found that the districts are now trying to follow a "NETWORK APPROACH" in road construction so that the roads have neither a beginning nor an end.

It was found that the cost data for the roads are not properly and adequately maintained at the local body levels. Hence, some crude estimates had to be made, which constitutes one limitation of the study.

Economics of Heavy Equipment Rental

Renting out heavy equipment for road construction has been a lucrative business for equipment owners. This is the reason why the number of suppliers is increasing, and the business is becoming highly competitive. Given the data and assumptions presented in Table 6, the annual variable cost to owner works out to only Rs. 380,000 while it generates a gross annual earning of Rs.2.16 million. This gives the B/C ratio to the owner of 1.69 and an IRR value of 18 percent in financial prices, which is very high (Annex 2 for financial and Annex 3 for eco-

Table 1

District	Road	Total length (km)	Length considered (km)	Technology
DOLAKHA				
Road 1	Mude-Melung	44	21	Mixed
	2.5 -14 km (Mude-Deurali)	11.5	11.5	District EB
	14-28 km (Deurali-Bhainse)	14	14	LB (RCIW)
Road 2	Bhirkot-Gairimudi-Chhaunde		14	LB (DRSP)
Road 3	Barabise-Bigu	63	15	EB
MAKWANPUR				
Road 4	Bhakunde-Pakani	15	15	LB (GTZ)
Road 5	Pakani Kharka-Baikuntha	13	13	EB
Road 6	Sitalchowk-Jatiya Pokhari	6	2.5	EB

conomic returns). The owner recovers the full cost of equipment in just five years. The return on investment must have been much higher a few years ago when there was less competition and hourly rental rates were nearly double the present levels.

The above financial analysis shows that heavy equipment businesses may also have been lobbying in favour of equipment based local road construction.

The excavator can open 5 m road track at the rate of 150 m per hour if the soil is soft. At this rate a 1.5-km road is opened in 10 hours. However, the speed of construction in the rocky portion is slower, and the type of rock governs it. For breaking the hard rocks, a breaker bucket can be attached with the equipment. For breaker attachment with excavator, an additional Rs. 10,000 per day of breaker use and an extra Rs. 1,000 per hour for excavator machine has to be paid as rent. Extra charge for equipment is levied as more power is required to operate the breaker.

The lubricant is changed during servicing, which is generally done after 500 hours of operation. Basic driver and helper salary is borne by the owner, and they receive extra payment from the user when the equipment is in operation. The diesel consumption of the equipment is 12-18 litres per hour depending upon the size and capacity of the equipment. While renting the equipment, the renting party has to bear the diesel cost.

The user (renter) also bears the cost of transportation up to the site and back, which works out to an average of Rs. 192 per kilometre. So, the per hour cost is Rs. 5,013 at financial prices, and it becomes Rs. 4,891 in economic prices. At this cost, 150 meters of a 5 m-wide road is opened in the soft soil section. It would require 50 labourers for a whole day for doing this and would involve a labour cost of Rs.

15,000. The earth work is, therefore, nearly 5 times cheaper and 8 times quicker when done with heavy equipment. However, the average calculation must be misleading because it will not be possible to rent heavy equipment for just an hour because the cost of transporting the equipment up to the site will be prohibitive. If it is rented for multiple hours or days, then it cannot be kept idle.

Rural Road Construction and Maintenance Costs

The costs in road construction entailed survey and design, social mobilization, mostly phased construction in LB roads (track opening, widening, CD structures and bio-engineering works), and supervision costs. The breakdown of per km costs in the construction of the selected roads has been presented in Table 7 for Dolakha district roads and Table 8 for Makwanpur district roads. According to the tables, the road costs per km were Rs. 3.33 million for Road 1, 3.69 million for Road 2, 639 thousand for Road 3, 1.82 million for Road 4, and 620 thousand for Road 5. As stated in the limitations section, precise data on all cost heads were not found, and some estimates had to be used based on experiences elsewhere and also with the help of parameters provided by the stakeholders during FGDs.

The direct quantified costs of the selected roads by cost heads are presented in the tables below:

The indirect costs, including the environmental costs, are also estimated for each road and are considerably higher for the EB roads. The sources of benefits are local peoples' movement and migration, incremental income from agricultural products, savings in food purchase, incremental income from business merchandise, etc. There also are other unaccounted benefits.

Table 2

DOLAKHA									
Works	Bhirkot-Chhaunde (Road 2)			Mude-Melung (Road 1)			Thansing-Bigu (Road 3)		
	Cost/ km	Share of labour (%)	Labor wage	Cost/ km	Share of labour (%)	Labor wage	Cost/ km	Share of labour (%)	Labor wage
Survey and design	14.1	20	2.82	18.3	18	3.30	26.1	15	3.92
Social mobilization	80.4	80	64.34	80.4	65	52.28	15.7	80	12.53
Track opening	690	90	621.00	633.9	70	443.71	0	0	0.00
3m widening	861	80	688.80	788.8	65	512.73	0	0	0.00
5m widening	1530.6	80	1224.49	1408.6	65	915.59	522	20	104.40
CD structures	308.2	30	92.45	283.1	30	84.94	41.8	30	12.53
Bioengineering works	79.4	50	39.68	39.7	50	19.84	23.8	50	11.90
Supervision cost	125.0			75.0			10.0		
Total direct construction cost/km	3688.7		2733.6	3327.9		2032.4	639.3		145.3
Routine maintenance	14.3	95	13.57	10.0	95	9.50	19.6	95	18.62
Periodic maintenance	28.6	95	27.14	53.6	65	34.82	142.9	20	28.57

Table 3

MAKWANPUR						
Works	Bhakunde-Pakani (Road 4)			Pakani-Baikuntha (Road 5)		
	Cost/ km	Share of labour (%)	Labor wage	Cost/ km	Share of labour (%)	Labor wage
Survey and design	15.0	25	3.75	25.6	20	5.12
Social mobilization	74.0	80	59.20	30.7	80	24.59
Track opening	311.0	90	279.94	0	0	0.00
3m widening	389.1	80	311.32	0	0	0.00
5m widening	693.2	80	512.00	512.3	10	51.23
CD structures	139.3	25	34.84	41.0	20	8.20
Bioengineering works	75.0	50	37.50	0	50	0.00
Supervision Cost	125.0			10		
Total direct construction cost/km	1821.7		1238.5	619.6		89.1
Routine maintenance	16.0	95	15.20	22.7	95	21.57
Periodic maintenance	33.5	95	31.83	166.2	25	41.55

A typical case of transaction cost reduction from road was observed in the Mude-Deurali section of the road. The cost of transportation of goods is Rs. 1.10 per kg from Banepa. It is Rs. 0.80 up to Mude and Rs. 0.30 from Mude to Deurali bazaar (8 km). Without the road, a porter would take 4 hours to reach Deurali from Mude. At the existing wage rate of Rs. 215 per 8 hour day, the portering cost from Mude to Deurali with 50 kg load will be Rs. 1.70 per kg or Rs. 0.19 per kg/km. So, with the availability of vehicle transportation, the transportation cost is reduced ten times. The importance of

road in this context is that it reduces the transaction costs in input acquisition and output sales significantly to render the local economic activities to be competitive. Such competitiveness can be achieved if there are bulk volumes of exportable products. In areas where such export is not feasible, the roads will only reduce cost of some consumption items such as rice, sugar, etc. imported from outside. The savings in such petty costs can not finance the maintenance of the road, and these roads will die their natural death. This is what is happening in many rural roads financed by VDC resources.

Indirect Costs including Environmental Costs

The construction of the selected roads also incurred some indirect costs that would have been saved had these roads not been constructed in the first place. In the roads studied, two major cost heads were the loss of farmed lands – directly in the respective alignments and that destroyed by the debris disposal; and the loss of forest (trees and shrubs) and pasture lands. While the farmed lands were lost forever, forest losses have been assumed to regenerate after about a decade. Human losses during construction and loss of infrastructure due to roads are also found elsewhere, but such losses were not reported in the selected roads.

Road Maintenance Costs

In road maintenance, two cost heads are involved: i) regular maintenance and ii) periodic maintenance. Under regular maintenance, local paid worker groups are assigned at the rate of about one person per 3-4 km. They are provided basic training in minor road maintenance works, and are also provided with small tools. The function is to clean the roads and drains on a regular basis, and to fill small pot-holes. Periodic maintenance is carried out at least once a year and during emergency needs in case of road blockages due to landslides. The

function is to clear landslides, fill larger pot-holes, and improve damaged structures.

Unaccounted Costs

Besides the above reported direct and indirect costs during road construction, there are other costs also which have not been accounted for. These include: i) eco-costs like reduced carbon sequestration and loss of habitat of birds and animals; ii) debris flow to water systems affecting water quality and aquatic animals etc. In addition, roads have also had other negative influences. Youths, for example, have changed their consumption and recreation patterns with easier accessibility to imported commodities like alcoholic products, games, noodles, and, in some cases, even narcotics and drugs.

Benefits from Roads

Roads are constructed for development and prosperity mainly through increased economic activities because of enhanced competitiveness and cost savings in travel, and imports and exports. In the selected roads, the benefit heads were: i) benefit from cheaper travel for productive works; ii) production and export of agricultural products; iii) food import at reduced cost; and iv) incremental business benefits from other merchandise movements.

Table 4: Summary of Phased Total Road Construction Cost

Road	Road length traversed (km)	Total cost (Rs.000)	Years taken for construction	Annual investment Cost Distribution (Rs.000)				
				Year 1	Year 2	Year 3	Year 4	Year 5
DOLAKHA								
Mude-Melung	25.5	85115	5	8795.4	8492	20525	11847	35456
Bhirkot-Chhaunde	14	51641	5	5602.6	5405	12629	11289	16715
Barabise-Bigu	15	9590	2	4499.0	5091			
MAKWANPUR								
Bhakunde-Pakani	15	27326	4	3304.1	3079	6583	14360	
Pakani Kharka-Baikuntha	13	8055	2	3727.9	4327			

Unaccounted Benefits

Besides the benefits categorically accounted in the previous section, there are a few other benefits that have not been built in the benefit analysis. Such benefits include access to inputs, services and technologies; opportunities for educational access for children outside the village; extension of health facilities; awareness through social mobilization, etc.

Financial and Economic Returns

While the financial analysis of each road has been done using the market prices, the costs are also converted to societal costs using economic prices (SCF, opportunity costs or shadow prices, etc.) The results of the computations are presented in the table hereunder.

The findings from the financial and economic return computations using the data, parameters and assumptions have been summarised as follows:

- ◆ All roads have positive return on both financial and economic investments, and the returns to the country/society are more than the returns to households in all cases. This justifies state investment support in rural roads development.
- ◆ The roads built using labour-based technology fared considerably better than those built using heavy equipment. This is due to the higher number and days of vehicle movement per year on LB roads.

CONCLUSIONS

The following conclusions have evolved from the study:

- ◆ Road is a number one priority at the local level and it is rightly so considering the spatial nature of poverty in rural areas
- ◆ Labour based roads are more pro-poor and can provide self-targeted employment to the poor. Hence, rural road construction can be made a pro-poor initiative by using labour based technology
- ◆ The existing government processes, particularly the budgetary process, is not favourable to opting for labour based technology in road construction. Instead, it encourages and even compels heavy equipment based technology usage.
- ◆ The current price trends also favour the choice of equipment based technology
- ◆ Use of equipment based technology in road construction has a strong association with unsustainable roads – high gradient in several spells, no water draining structures, no protection structures, high environmental costs, about 5 times more prone to landslides compared to labour-based roads
- ◆ Equipment based technology is financially cheaper and faster, but not necessarily associated with high returns. In fact, the returns are considerably higher in roads built using LB technology.
- ◆ Most of the non-functioning and seasonal roads are constructed using equipment based technology

Table 5

		Financial			Economic		
Road		NPV	BCR	IRR	NPV	BCR	IRR
DOLAKHA							
Road 1	LB+EB	\$73,183	1.83	15.9%	\$85,712	2.27	18.9%
Road 2	LB	\$24,707	1.47	12.7%	\$41,915	2.34	19.7%
Road 3	EB	\$1,880	1.05	9.5%	\$7,328	1.24	14.3%
MAKWANPUR							
Road 4	LB	\$18,644	1.60	14.6%	\$29,764	2.71	24.6%
Road 5	EB	\$499	1.01	8.4%	\$6,915	1.25	14.7%

- ◆ The concept of linking each VDC, having a ring road in the district headquarters, and linking highly productive pockets in the district is fine. But the current trend is advancing much beyond this – to the extent of even reaching each and every house. This trend will have serious environmental consequences for the district and which have already begun to become visible.
- ◆ There are several known instances of financial abuses, but none has been examined and penalized. This is a clear state of impunity and lack of financial discipline.
- ◆ Whenever and wherever possible, the blend of LB and EB technology can be used in rural road construction to harness the positive features of each technology – cheaper and faster from EB, and sustainable and poverty-reducing from LB technology.

RECOMMENDATIONS

Road Planning

- ◆ The road to be built must be planned in a participatory way, and should be a part of the DTMP. No road should be financed by local bodies if it is not included in the DTMP.
- ◆ Feasibility and environmental assessment should be undertaken on a mandatory basis, and the problems found in the environmental reports should be factored into the road design

Fund Management

- ◆ No road should be started without sufficient funds in hand, or without an assured source
- ◆ The fund support from local bodies and the centre should be disbursed at the beginning of the lean season (November). For this, the following changes need to be made:
 - The fiscal calendar has to be changed in a way which will allow the develop-

ment funds to be available for use at the local level at about the middle of November

- The budget release process should be expedited
- The practice of budget freezing for development works at the end of the fiscal year should be stopped

Preparing the Community

- ◆ Social mobilization of the communities in the influence areas of the roads should be made an obligatory part of the road building process. This is important so as to garner local ownership and consequently prevent intentional tampering of the roads. The social mobilization message and mode of delivery should be tailored based on the social capital level of the community.

Road Construction

- ◆ The use of bulldozers and rock blasting materials should be fully disbanded as the tremor effect produced by these affects the surrounding geological formations, thus significantly enhancing the probability of landslides
- ◆ It is suggested to revise rural road policy to allow the
- ◆ LB technology in road construction should be encouraged. However, in order to harness some positive features of the EB technology, use of excavators should be allowed in: i) road widening; ii) ridge alignments; and iii) long unmanned alignments that require labour camping under LB methodology. Similarly “Breaker attachments” should be allowed to break very hard rocks that require tedious chisel cutting under the LB methodology. However, the equipment use should be duly complemented by water management structures (side and cross drains), other protection structures, and bio-engineering works in critical areas.

- ◆ DOLIDAR and local bodies should institute a system of annual POLICY AUDIT on rural road construction by the local bodies to assess policy compliance. Any failure to comply with the policies should be dealt with budget cuts.

Road Operation and Maintenance

- ◆ All rural roads should have O&M funds for timely maintenance. Such funds must be complemented by beneficiary contributions out of the incremental income from the roads. A system of reasonable taxing for goods movement can be put in place for this purpose.
- ◆ Local skill for road maintenance should be developed through training

Enhancing the Benefits from Road

- ◆ Public service packages in agriculture and social sectors (health, education, etc.) should be a part of the road design so that the benefits from road are enhanced to their full potential

Other Issues

- ◆ The rent-seeking practice is anti-poor and so the existing corrupt practice should be strictly controlled. For this, public auditing has to be made mandatory.
- ◆ One of the reasons for unsustainable infrastructure at the local level is the shortage of technical manpower. The resource availability with the VDCs has increased by up to ten times, but the availability of technical manpower remains the same. For this, a separate budget head for the outsourcing of technical manpower should be provided in the grant funds. It is also recommended that in the new state restructuring for new Nepal, the current Illakas have to be defined as the new local body equivalent to a current VDC. If Illaka is taken as the lowest local body structure, then it will have adequate resources and capacity to have its own technical unit.
- ◆ Compensation arrangement should be made in the case of those households whose entire plot of land is used by the road

PAPER V

Local Government Revenue Raising from Natural Resources: How better Natural Resource Management can Increase Local Tax Revenues in Nepal

Som Lal Subedi¹

1. Introduction

Almost all countries are now experimenting with decentralization, and 40%¹ of the world population is managing state affairs under a federal mode of governance. Many countries are adopting decentralization because they believe it will help in economic growth or rural poverty reduction, and achieving the central government's intervention goals. It is also considered as a means of deepening democracy. Designing decentralization is more complex if we considered fiscal decentralization. Under fiscal decentralization, two major components, viz. expenditure assignment and revenue assignment, are very important. The match between expenditure responsibilities and revenue determines the efficiency of decentralization. The share of revenue from natural resources given to local governments is primarily considered by the local governments as something over which they have a right to claim. Generally, the revenue sharing with local governments from natural resources has the rationales of proximity, efficiency, and sustainability.

Local governments are demanding more authority over fiscal resources globally. The ownership, exploration, extraction and processing of natural resources are directly linked with local governments. Currently, fiscal federalism is emerging, and the tiers of the governments are more aware about natural resource management and revenue potentialities. Minerals,

petroleum, forests, hydropower energy, and fisheries are the main types of natural resources that generate revenue for local governments.

In Nepal, sand, stone, gravel, hydropower, forests, mining, and mountaineering royalties are potential natural resources and revenue from those resources are being shared between the central government and local bodies.

2. Arguments for Assigning Natural Resource Revenues to Sub-national Levels

There is increasing pressure for recognizing the right of sub-national governments, and in some cases indigenous communities, to share natural resources. Arguments for assigning revenues from natural resources to the sub-national level can be briefly pointed out as follows:²

- a. Additional budget for investment in infrastructure
- b. Environmental protection
- c. Poverty and disaster concerns and impact on locality
- d. Constitutional/legal provisions
- e. Fosters competition among local governments
- f. Policy instruments are necessary to utilize revenue potentiality
- g. Capacity enhancement at the sub-national levels

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3. Instruments for Revenue Collection on Natural Resources and Acquisition of Revenues

There is no specific model for revenue collection on natural resources. Due to uneven distribution of resources, fiscal transfers should be the equalization means. For distribution derivation principle, central and regional pool creation and distribution mechanism can be adopted. Some of the instruments for revenue collection on natural resources and acquisition of revenues are as follows:

- i. Acquisition of equity in mining enterprises
- ii. Production sharing arrangements
- iii. Tax instruments: fixed fees, royalties, income tax
- iv. Resources rent tax
- v. Intergovernmental transfers based on the revenue from natural resources revenue

4. Nepalese Context

In order to provide revenue from natural resources, provision has been made in the Interim Constitution of Nepal, LSGA and LSGR. The governance of Nepal has taken various measures for collection and distribution of revenue from natural resources.

a. The Interim Constitution of Nepal, 2063 (2007)³

The Interim Constitution of Nepal, 2063 has made provision for arrangement and mobilization of resources. It is stated in the Interim Constitution of Nepal that there shall be mobilization and allocation of responsibilities and revenue between the Government of Nepal and Local Self Governance related authorities as provided by law in order to make the local self-governance related authorities accountable for the identification, formulation and implementation of local level plans while maintaining equality in the mobilization, appropriation of means and resources, and in the bal-

anced and equitable distribution of the fruits of development with a view to strengthening the local self governance related authorities for local development. It is also stated that while mobilizing and allocating the revenue, special attention shall be accorded to the overall upliftment of those classes and communities who are backward socially and economically in such a manner so as to have a balanced and an equal development of the country.

b. Constituent Assembly's Committee for the Allocation of Natural Resources, Financial Rights and Revenue⁴

The Constituent Assembly's Committee for the Allocation of Natural Resources, Financial Rights and Revenue has proposed revenue sharing from natural resources from the perspective of liability of the state, directive principle, and sharing benefit with communities and different tiers of government. The provisions under each heading are as follows:

Liability of the State:

Needs of local communities to be given priority, and benefits to be shared equitably while conserving, promoting and sustainably using the natural resources.

Directive Principle:

- ◆ To attain the goal of sustainable development while protecting the environment and maintaining intergenerational equity.
- ◆ Avoiding the concentration of natural resources in a limited number of people.
- ◆ Adopting the policy of conserving and promoting natural resources.

Sharing of Benefits with Local Communities:

State will make necessary arrangements to make equitable the benefits from the natural resources. A certain portion of such benefits will be availed to the people living in project-affected areas in the form of royalty or goods/ services.

If local communities are interested in investing particular projects, they will be allowed to do so up to a certain limit depending upon the nature and scale of the project.

Sharing of Benefits with Different Tiers of Government:

- ◆ Each level of government has the right to raise revenue from the sources and bases allowed to it (e.g. irrigation, electricity)
- ◆ Higher tiers of government to transfer revenue to the lower tiers on equitable basis following the principle of revenue sharing
- ◆ Concerned governments to avail the affected communities with the revenue thus generated on equitable basis

c. Local Self-Governance Act, 2055 (1999)⁵

The LSGA has made provision related to revenue allocation (clause 220), and selling of natural resources (clause 218) by local bodies. The provision related to revenue allocation points out that the concerned District Development Committee shall be entitled to the amount as prescribed out of the following amounts:

- i. Registration fees to be obtained by the Government of Nepal (GON) for the purchase and sale of house and land.
- ii. Amount to be obtained by the GON for royalty of mines, petroleum products, forests, water resources and other natural resources.
- iii. Entrance fee to be obtained by the GON for entry of tourists into district development areas.

Regarding the provision of selling of natural resources, it is mentioned in the LSGA that the District Development Committee may sell as prescribed the sand in the rivers and canals, gravel, stones, soil, wood swept by river etc. lying in its area. Out of proceeds of such sale of goods, up to 35-50 percent amount shall have to be provided to the concerned Village Development Committee and the Municipality.

d. Local Self-Governance Regulation, 1999 (2056)⁶

The Regulation has provisioned the following allocation criteria on revenue sharing for local bodies:

1. Out of the total revenue collected from registration fee of house and land,
 - (a) Ninety percent if the total revenue collected is five million rupees.
 - (b) After that, sixty percent of the amount up to ten million rupees.
 - (c) After that, thirty percent of the amount up to twenty million rupees.
 - (d) After that, twenty percent of the amount up to thirty million rupees.
 - (e) After that, fifteen percent of the amount up to fifty million rupees.
 - (f) After that, ten percent of the amount up to one hundred million rupees.
 - (g) After that, five percent on the amount exceeding one hundred million rupees.
2. Fifty percent of the amount collected from mining royalty.
3. Ten percent of the amount collected from forest products in forest areas.
4. Fifty percent of the royalty amount received by the GON from Magh 2060 (January/February 2004) from the production and sale of hydro electricity. Such amount shall be distributed on the following grounds as determined by the meeting of the committee comprising of the Chairperson of the District Development Committees or authorized representatives:
 - (a) Twelve percent to the District Development Committee in whose area electric powerhouse is operated.
 - (b) Thirty-eight percent to the District Development Committees of the development region in which electricity is produced.
5. Thirty percent of the fees and royalty amount received from trekking and tourists entering National Parks and Wildlife Reserves.

6. Thirty percent of the royalty to be received by the GON for mountaineering.
7. Thirty percent of the entrance fee collected by the GON from tourists entering District Development Areas.

e. Revenue Collection

The revenue sharing from different sources during FY 064/65 to FY 066/67 is shown below:

Revenue Sharing	FY 064/65 Rs. million	FY 065/66 Rs. million	FY 066/67 Rs. million
Royalty allocation (House and land registration, mining, forests, hydro power, tourism) to DDC	1088	1115	1643
House, land tax and integrated property tax collected by municipalities	298	446	—

Source: Ministry of Local Development and Local Bodies Fiscal Commission, 2067, MLD/Udle (2008-09).

f. Institutional Framework

There are different institutions directly or indirectly engaged in revenue collection. Central institutions are responsible for policy making and facilitation. Local institutions are directly involved in local revenue collection. The major institutional framework is as follows:

- ◆ Local Councils
- ◆ Executives
- ◆ Local tax advisory committees
- ◆ Bureaucrats and professionals
- ◆ Central government cooperation and sectoral behavior, including Local Bodies Revenue Advisory Committee at the Ministry of Local Development.

g. Safeguard Measures

The following provisions have been incorporated in the Acts as a safeguard measure:

- ◆ The revenue received under revenue sharing cannot be spent on current costs.
- ◆ As per the Environment Act, 2053 and its Regulation, Initial Environmental Evaluation and Environmental Impact Assessment are mandatory for the extraction and processing of natural resources. There are many sectoral acts and regulations which have defined the terms and condition and modality for using natural resources.
- ◆ Participatory planning process at the local level and its adequate maturity will be real safeguard measures.

h. Issues

The assignment of revenue from natural resources to sub-national level governments

tends to generate rivalries between the constituent units of the same nation – between central and local levels and also across local governments. In developing countries with an unevenly distributed endowment of natural resources, the sharing of natural resources often puts considerable strain on national unity. In Nepal, the natural resources potentiality is not fully utilized. There is no linkage between local taxes and local governance. The quality of governance is still far from desirable. But the increasing awareness of the people and the vested interests of national and international forces in natural resources are going to create stress in managing natural resources. As far as local revenue is concerned, there are many issues which have been bred by the imperfection in both central and local governance. Some of the major issues in this regard are as follows:

- ◆ Linkage with the services and no linkage with fiscal transfers
- ◆ Participatory local planning and targeting the vulnerable communities
- ◆ Institutional capacity of local bodies, pricing, investment
- ◆ Central coordination and monitoring mechanism
- ◆ Revenue potentiality vs. effort
- ◆ Extraction and processing of natural resources as well as contradicting Acts
- ◆ Investment plan and continued yielding of revenue
- ◆ Compensation to the affected people
- ◆ National integrated frame on natural resource utilization

- ◆ New phenomena, lack of vision and revenue planning
- ◆ Environmental, poverty and disaster concern are not taken seriously
- ◆ Expenditure credibility and transparency. Fiduciary risk is high, accountability is weak.
- ◆ Many negative impacts seen: floods, landslides, biodiversity loss, local conflict, vested interests of the local elites, deteriorating law and order situation
- ◆ Due to political transition and the delayed process of constitution building as well as state restructuring, the future structure of the levels of government is not predictable

i. Way Forward

Abundant natural resources provide a basis for growth in many developing countries, and investment can help expand the export sector. Developing value chains that link natural resources to processing activities using domestic suppliers of goods and services will help produce higher returns, create more jobs, and ensure that the resulting growth is broader-based and more sustained. In Nepal, the resources are highly centralized. In spite of popular slogans for a prosperous Nepal, decentralized governance is not prioritized by the centre. The prevailing tendency among political and administrative elites not to bring about democratic decentralization unless circumstances compel them to do so is the main constraint for developing an efficient governance mechanism at the local level.

In the context of state restructuring and adoption of a federal model of governance, assigning revenue authority on natural resources may need a wide range of analysis. Consider-

ing the immediate or the transitional period, the following can be prescribed (under two categories) as the way forward for bringing about better natural resource management and increasing local tax revenues:

a. General

- ◆ Role delineation of different tiers of government under federalism.
- ◆ Matching fund with services to be delivered by the respective tier of the government.
- ◆ Linking with overall fiscal transfers and equalization.
- ◆ Protection of natural resources and environmental degradation.
- ◆ Special local benefits assurance.
- ◆ Institution of capacity, accountability and financial discipline.
- ◆ Deepening democracy and inclusive budgeting at the local level.
- ◆ Political commitment.
- ◆ Understanding the links between climate change and development.
- ◆ Compliance of laws and policies.

b. Technical

- ◆ Potentiality assessment and cost benefit analysis.
- ◆ Vulnerability mapping/Hazard mapping.
- ◆ Land use planning.
- ◆ Sectoral framework and coordination.
- ◆ Specialized human resources (Sector wide and Institutional).
- ◆ National perspective and monitoring tools.
- ◆ Long-term leasing policy.
- ◆ Viable geographical size of local government.
- ◆ Adoption of disaster risk reduction technique, including earthquake risk reduction, in infrastructure development and operation.

The Environments of the Poor in the Context of Climate Change and the Green Economy – Alternative Energy Linking Climate and Environment Consideration

Dr. Narayan Prasad Chaulagain¹
Raju Laudari²

1. Background

Nepal's energy consumption in fiscal year 2008/09 was 9.4 Million Tons of Oil Equivalent (MTOE), which increased to 11.9 MTOE in 2009/10. The consumption ratio of traditional, commercial, and renewable sources of energy in the fiscal year 2009/10 stood at 87.3%, 12% and 0.7% respectively, demonstrating the persistent high dependency of the Nepalese economy on traditional energy sources (fuel wood, agric residue and dung). The low level of commercial energy consumption in the country reflects the very low level of industrial activities, which has changed little over the last decade. Another major characteristic of the energy scene is the dominance of the household sector (90.3%), over other sectors (9.7%) in total energy demand, mostly met by biomass fuels. Rural households account for about 83% of the total households in Nepal. About two-thirds of the energy is used for cooking in rural areas, and household monetary expenditure on energy is very low. There is a strong correlation between per capita energy consumption and the country's development status. Nepal's per capita annual energy consumption is about 14 GJ, and ranks among the lowest in the world. The demand for energy is growing at the rate of 12% per year (National Economic Survey, MoF, 2010).

Nepal has a very high potential of exploiting Renewable Energy Resources. However, this potential has not been utilised to the fullest. The positive role of Renewable Energy Technology (RET) for the fulfillment of the energy needs of rural people was recognized by the Government as early as the 80's in the Seventh Five Year Development Plan, and there was a gradual increase in the recognition of its role in rural development plans and programs. Since the establishment of AEPC in 1996, a number of related policies for speedy and equitable promotion of these technologies followed along with various projects/programs with support from the Government of Nepal and External Development Partners (bilateral and multilateral external assistances).

Only around 54% of the total population has access to some form of electricity (either grid power, solar or mini-grid), leaving 60% of the population without access to electricity. Of these, only 9% of the total population is using renewable energy, mostly derived from micro-hydro or solar power. Access to and use of renewable energy is becoming an issue of national priority with the increase in environmental awareness.

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2. Renewable Energy Technologies: Potentials and Achievement

The possible renewable energy technologies, which can generate power by exploiting the locally available energy resources, are pico-hydro and micro-hydro power, biomass (biogas, briquettes, gassifier), liquid bio-fuel, improved cooking stove, solar photovoltaic, solar thermal and wind powered plants. Of these technologies, micro-hydro, biogas, improved cooking stove, solar photovoltaic (PV) home systems, and solar water heaters are becoming popular and are at varying stages of commercialization. However, technologies such as solar cooker, solar dryer, briquettes, wind and geothermal are only in the research and demonstration phase, and still need to be commercialized.

The estimated total technical potential and economical viability of biogas plants is about 1.1 million plants of which 1,000,000. As of December 2010, more than 220,000 biogas plants of varying capacities (4, 6, 8, 10, 15 and 20 m³) have been installed. There is a huge potential for biomass technologies like Improved Cooking Stoves (ICS), Beehive briquettes, Briquetting mechanism and Gassifier. More than 331,000 ICS have so far been installed through various governmental and non-governmental organizations.

In Nepal, hydro power stations for the generation of mechanical and electrical energy up to a capacity of 100 kW come under micro-hydro. The Government of Nepal is providing subsidies for the installation of micro-hydro plants up to 500 kW according to the location and remoteness of the districts of Nepal. There exists a huge hydropower potential and an ever increasing market, and till 2008/09, there were about 1977 micro-hydro (including pico-hydro) electrification schemes installed in various parts of the country with a total installed capacity of about 13.9 MW since 1962. Also, there are about 6253 units of turbine mills with

a mechanical power of 15.2 MW installed in the country for milling purpose. Nepal, being located in favorable latitude, receives ample solar radiation. The average solar radiation varies from 3.6–6.2 kWh/m²/day, and the sun shines for about 300 days a year. The development of solar energy technology is thus reasonably favorable in many parts of the country. With national average sunshine hours of 6.8/day and solar insolation intensity of about 4.7 kWh/m²/day, there is a huge potential for solar thermal devices such as Solar Water Heaters (SWH), Solar Dryers (SD), and Solar Cookers (SC). Presently, SWH have been fully commercialized and, till 2009, more than 200,000 of them have been installed in the country.

Wind is still an unharnessed energy resource in Nepal. Due to its diverse topography and the consequent variation in meteorological conditions, it is difficult to generalize wind conditions in the country. Specific areas have been identified as favourable for viable wind energy generation. As per the recently published report of AEPC, 2008 under Solar & Wind Energy Resource Assessment in Nepal (SWERA), the commercial potential of wind power is 3,000 MW. A pilot project for demonstration and dissemination is being carried out by various organizations like AEPC, Practical Action, etc.

3. Climate Change Impacts Including on Energy Resources

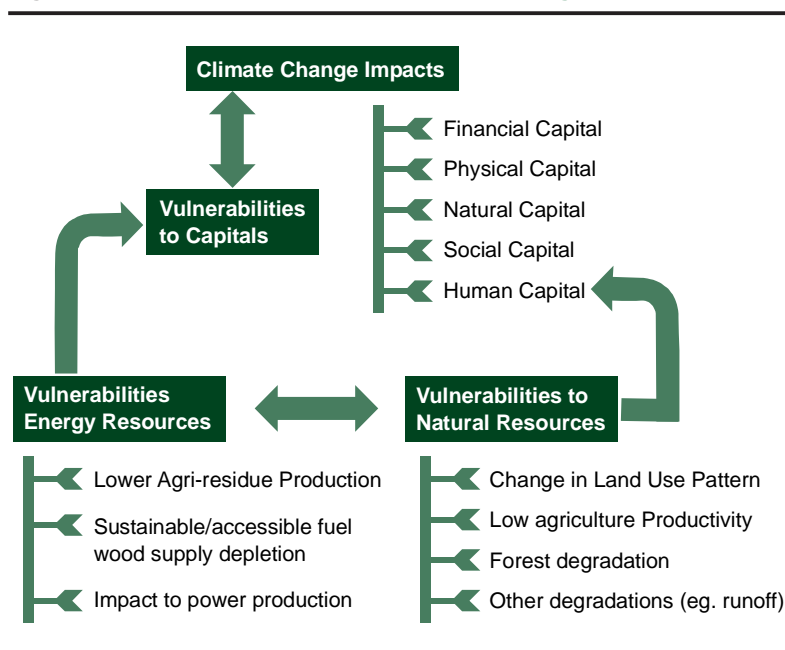
Climate change has been exacerbating the environment and the economic aspects of vulnerable communities. It has impact on natural resources and livelihood on which vulnerable populations are relying for their daily sustenance. Climate change has huge impacts on physical, natural, social, human and financial capitals in different ways. All these impacts are in a closed environment and have cross implications on one another as shown in Figure 1. Since vulnerabilities to natural resources also includes change in land use pattern, forest

degradation, changes in runoff of rivers and streams, there are implications for the energy supply base of the country as well. Additionally, this also generates effects on different capitals and on the capacity to continue pursuing different activities.

4. Role of Renewable Energy Technologies (RETs) on Climate Change Mitigation

Renewable energy technologies like biogas, solar, micro/mini hydro, improved cooking stoves, improved water mills have been contributing in reducing emission and also have good potentiality of carbon mitigation in future as well. The biogas replaces firewood for cooking hence avoids deforestation. The improved cooking stoves lead to reduced greenhouse gas emission, mainly CO₂ by replacement of non renewable biomass used for cooking. Micro/mini hydro plants produce electricity for supplying it to households and other electrical end-use enterprises. Use of the generated electricity replace possible establishment of diesel mills thus reduce use of fossil fuels such as diesel used in rural areas of Nepal for lighting and agro-processing needs. Solar home systems replace kerosene lamps used for lighting at rural household level. Similarly, improved water mills avoids possible establishment of diesel mills for agro-processing. Table 1 below shows carbon mitigation potential from decentralized renewable energy technologies and mitigation impacts achievement in Nepal.

Figure 1: Different Dimensions of Climate Change Impact



5. Linking Renewable Energy with Climate and Environment Considerations

Energy End-Use devices play a significant role in the environment and economy of any agro-ecosystem. Improved end-use device and energy sources play a major role in lowering fuel consumption, energy expenses and greenhouse gas emissions. The rationality of alternative energy promotion in this context can be characterized from the typical energy ladder of developing countries like Nepal. As shown in Figure 2, switching to clean and improved source of energy and technology is usually governed by availability, accessibility and

Table 1: Carbon Mitigation Potential and Achievement in RET Sector

Renewable Energy Technologies	GHG ER/Unit	GHG ER Potential (tone CO ₂ eq)	GHG ER Progress (tone CO ₂ eq)	Assumptions
Domestic biogas plants	2.3ton CO ₂ eq/plant/year	50,600,000	10,120,000	Life: 20, Potential 1.1 million
Micro-hydro power plant	2.3ton CO ₂ eq/Kw/year	3,450,000	5,17,500	Life: 15, Potential: 100MW
Improved Cooking Stove	1.2 ton CO ₂ eq/plant/year	5,400,000	1,188,000	Life: 3, Potential: 1.5 million
Solar Home System	0.22 ton CO ₂	3,300,000	660,000	Life: 15, Potential: 1million
Improved Water Mills	8 ton CO ₂ eq/plant/year	2,000,000	496,000	Life: 10, potential: 25000

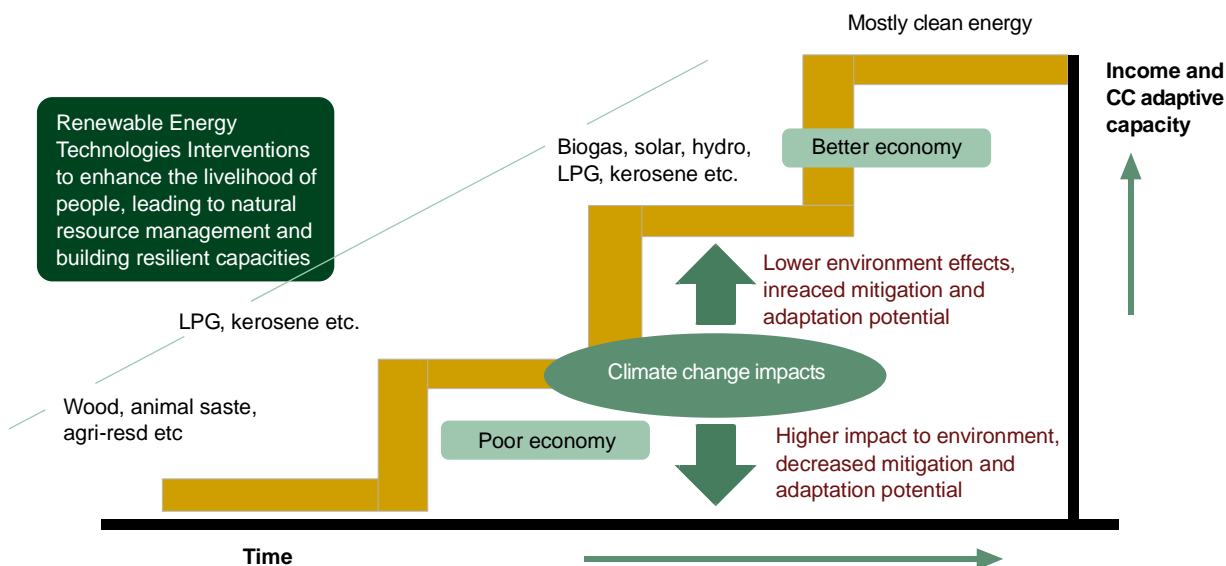
affordability of the particular source and technology. As the level of income improves, selection and usage of different energy technologies and sources also improve. It can normally be observed that it is mostly lower income groups that are dependent on unsafe, inconvenient and non-environment friendly energy technologies and sources. These sources have low contribution to adaptation and mitigation. People having medium and high economic status have access to more convenient and improved source of energy and technology, and also have high mitigation potential as presented in Figure 2. However, the use of clean and environmentally friendly energy technology are greatly determined by people's awareness level and sensitivity to climate change problems.

Intervention of renewable energy technologies not only improves access to convenient source of energy, but also supports the promotion of different livelihood activities that ultimately increase climate change adaptability of the users. Since alternative energy technologies play a significant role in reducing drudgery and health impacts and also improve community development activities, they have a wide scope in building resilience capacity to the impact of climate change.

The role that energy plays in poverty reduction, ecosystem management and vulnerability reduction can be analysed by reviewing a general framework for linking environmental management, poverty and the Millennium Development Goals (MDGs). This is because if we can identify the relationship between decentralised energy services provision and environmental management, it will ease the establishment of links and opportunities to scale down the vulnerabilities.

With sound physical and institutional design, renewable energy contributes positively to all the environmental management drivers associated with poverty reduction. Decentralized alternative energy contributes to the sound and equitable management of biodiversity and ecosystems by lessening pressure on natural forests in several ways. This system improves agricultural productivity by providing energy for irrigation pumping and post-harvest processing. These productivity improvements can in turn reduce pressure to convert forest to agricultural land otherwise required to maintain or increase productivity. If biomass energy feedstock is produced by afforestation on degraded land, the deforestation pressure on na-

Figure 2: Household Level Energy uses with Climate and Environment Considerations

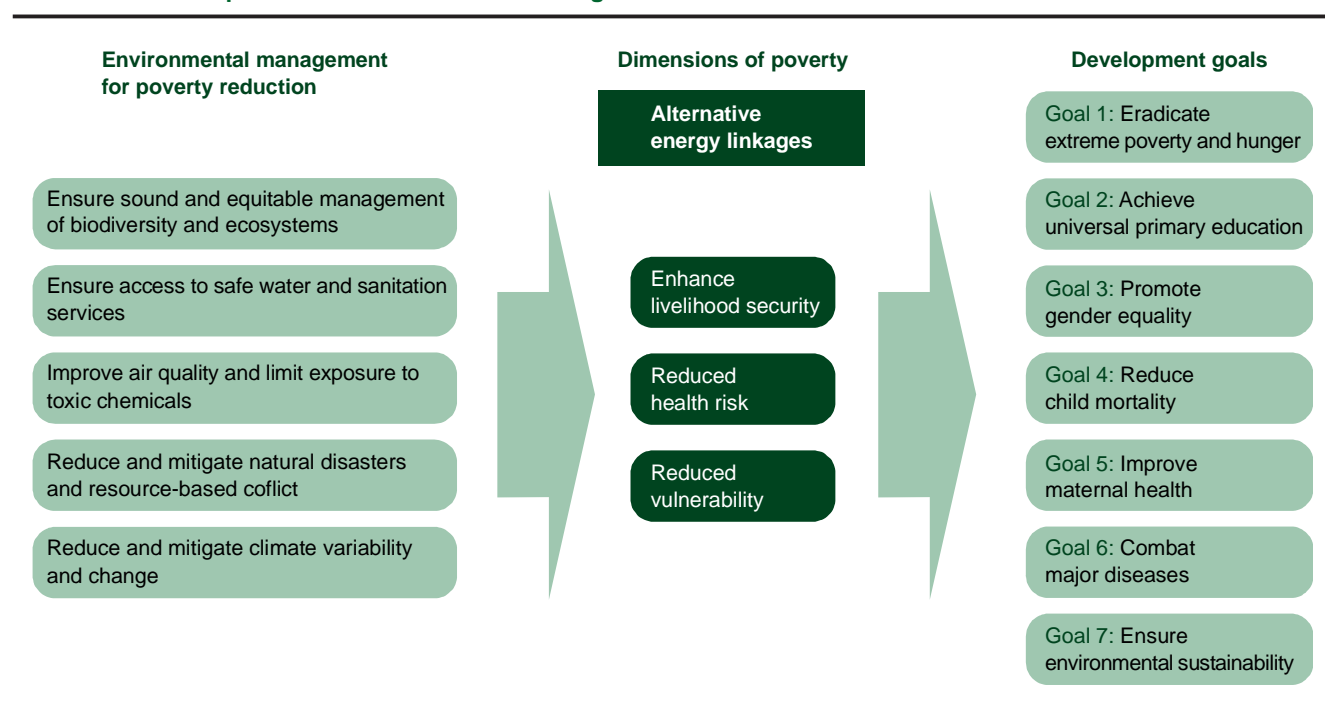


tive forests is reduced and biodiversity conserved. Uses of RE technologies contribute to ensuring access to safe water and sanitation services. Renewably-generated electricity for household lighting, or bio mass energy derived liquid fuels for cooking, or the introduction of improved cooking stoves to make more efficient use of traditional biomass limit the exposure to the toxic by-products of traditional biomass combustion. In Nepal, traditional biomass provides almost all primary energy demands, the largest use of which is for cooking. Biomass energy can potentially reduce and mitigate natural disasters such as droughts and floods. If biomass feedstock is also produced by afforestation in degraded watersheds, floods and droughts can be attended by improved watershed function through reduced run-off and increased deep percolation. Alternative energy technologies can reduce and mitigate climate variability and change. These technologies and sources have less or do not emit greenhouse gases. In the case of sustainably harvested biomass energy, it is carbon neutral.

Renewable energy acts as prerequisite and cross-cutting tools to achieving the MDG targets and goals. For example, better energy access promotes universal education in two fundamental ways. Improved accessibility of biomass energy reduces a major labour burden on women and children, particularly girl children, and improves their opportunities for education. Figure 3 gives an overview of how alternative energy technologies contribute toward meeting the MDGs, including Nepal's national objective of poverty reduction.

Decentralized renewable energy technologies like biomass, solar, wind, mini/micro-hydro, etc. play a vital role in natural resource management. For instance, promotion of biomass energy can create a positive cycle of improving soil and water conservation with benefits to both land and water resources as shown in Figure 4. This has positive impact on ecosystem services and potentially support the enhancement of livelihood security by improving agricultural productivity and food security, and reducing vulnerability to floods and

Figure 3: Conceptual Model of Linkages between Renewable Energy, Poverty, Millennium Development Goals and Climate Change Resilience



droughts. Improved accessibility to abundant biomass energy is also a critical constituent of the wellbeing of poor women, reducing their labour burden and health risks. Collectively, these interactions contribute to poverty reduction and increased adaptive capacity to climate change. In some specific cases such as watershed-based biomass production and irrigation pumping, the link between alternative energy and climate change adaptation is obvious.

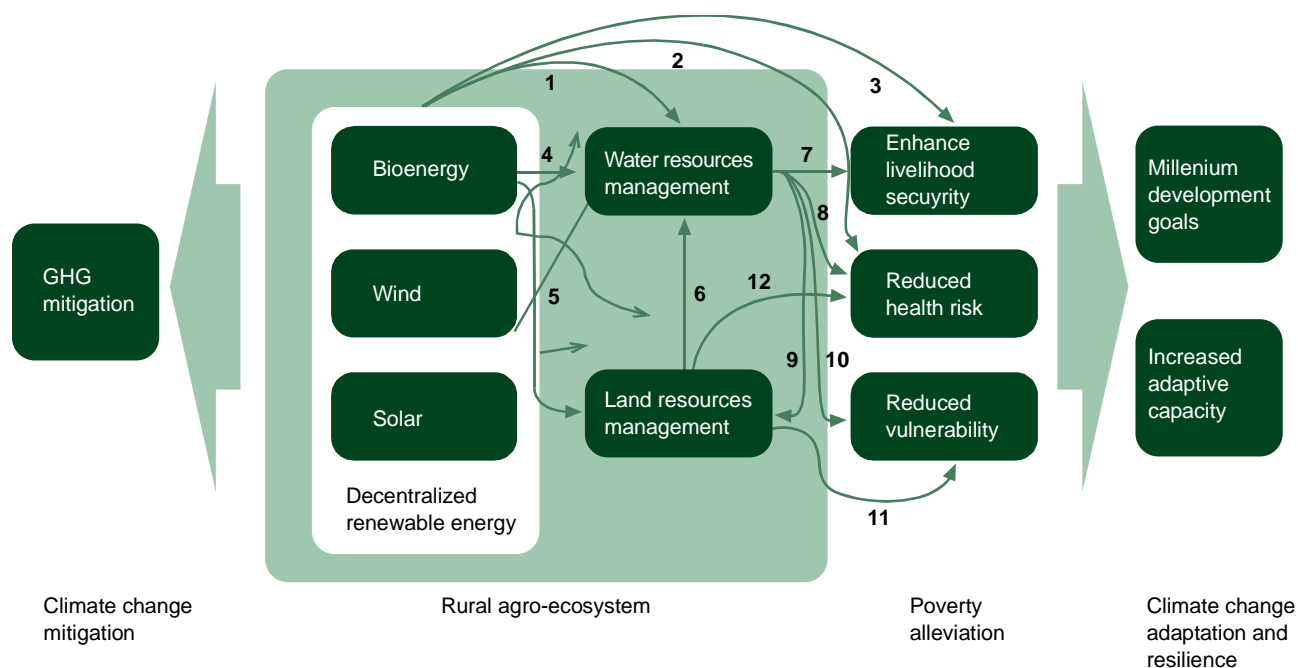
6. Conclusion

Decentralized renewable energy technologies have huge potential in contributing to climate change mitigation and adaptation through livelihood improvement of the poor people. The major contribution of these technologies includes the following:

- ◆ Reduces deforestation
- ◆ Reduces use of fossil fuel (kerosene, diesel, LPG)

- ◆ Reduces indoor air pollution and related diseases
- ◆ Contributes to GHG emission reduction
- ◆ Supports the establishment of micro-enterprises e.g. agro-processing, bakery, saw mill etc.
- ◆ Provides access to information (TV, Radio, Telephone)
- ◆ Enables saved time to be utilised in income generating and community development activities
- ◆ Brings about saving on regular expenses (energy, health etc.) of HHs
- ◆ Reduces indoor pollution and improves physical environment of surroundings
- ◆ Supports women empowerment and provides opportunity for education to girl children
- ◆ Contributes positively to gender and social inclusion
- ◆ Has positive impact on the country's balance of payment
- ◆ Ultimately enhances adaptive capacity to climate change through poverty reduction

Figure 4: Decentralized Renewable Energy-Mitigation and Adaptation Nexus



Community Based Forestry and Climate Change: Implications for Environment and People Living in Poverty in Nepal

Bharat K Pokharel¹
Peter Branney²

Summary

This paper analyses Nepal's community and leasehold forestry policies and practices to demonstrate how these approaches have contributed to addressing the issues related to forest degradation in the past and the newer agenda of climate change. The main focus of this paper is on the role of community and leasehold forestry in tackling both poverty and environmental issues, and it describes the effects of the policy environment on community and leasehold forestry. We argue that whilst reducing poverty is still the single most important Millennium Development Goal, the increasingly negative effects of climate change on the poorest and most vulnerable people have further worsened their livelihoods situation.

We show that community and leasehold forestry practices assist forest dependent poor people in adapting to climate change and mitigating its effects. However, this is not yet well documented and credited. Further, we argue that adaptation and mitigation measures are not mutually exclusive at the household level. However government agencies responsible for policy formulation and designing of programmes for climate change adaptation

and mitigation are different. Coordination mechanisms among agencies at the central level to enable them to provide services to the poor are lacking due to which the transaction costs for poor people to get access to such services are high. We suggest that multi-stakeholder mechanisms at all levels need to be institutionalised – especially at the local level to promote a landscape approach to planning and implementation. Examples are cited from various districts where the community and leasehold forestry programmes have been implemented to restore forest resources while, at the same time, targeting the poorest and most vulnerable people in their fight against poverty. Finally, the paper provides some policy options and recommendations for crafting a new programme that has all the elements of a policy enabling environment and pro-poor governance; job creation and incomes; institution building at the grassroots level; and sustainable forest and tree resource management to increase climate resilience both at the resource and community levels.

Key words: community forestry; leasehold forestry, climate change, adaptation, mitigation, climate resilience, poverty, livelihoods, sustainable forest management

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1. The Context of Community and Leasehold Forestry in Nepal

Nepal's Master Plan for the Forestry Sector (1989), the Forest Act (1993), Forest Regulations (1995), Operational Guidelines (1995), and various Five Year Plans (from 2002 onwards) provide the legal and operational framework for Nepal's community forestry programme. These instruments have legitimised the concept of Community Forest User Group (CFUG) as an independent, autonomous and self-governing institution responsible for protecting, managing and utilising any patch of state forest with defined boundaries and group members. CFUGs are formed democratically and are registered at the District Forest Office (DFO) with a CFUG Constitution. This defines the rights of users to a particular forest. Similarly, the leasehold forestry programme was launched by the Government of Nepal to specifically target people living in poverty, and has guidelines and operational procedures in place. Both these programmes directly and indirectly contribute to the Millennium Development Goals of poverty reduction and environmental sustainability and now increasingly to climate change mitigation and adaptation. There is evidence showing that the policies and practices of these two programmes are increasingly becoming pro-poor and climate resilient. There are visible and measurable impacts of community and leasehold forestry on poverty reduction and on addressing the negative effects of climate change. These programmes promote pro-poor governance and, as a result, increase poor people's access to forest resources and their capacity to be climate resilient. Even in the absence of local government, multi-stakeholder institutional mechanisms are established and are targeting the poor in a coordinated way. There are possibilities that a landscape approach could be promoted to initiate the climate change agenda in a more aggressive way in the near future.

There are around 15,000 CFUGs in Nepal, 80% of which are federated at the village, district and national levels. The federation (FECOFUN) takes a wider role in the forestry sector and civil society, and has an influential role in policy making processes at local, national and even international levels. About 23% of Nepal's forests (1.2 m ha) has been handed over to such CFUGs, and about 38% of Nepal's population (1.6 m families) are now members (mainly in rural areas). The average number of households per group is 115, and the average forest area handed over is 85 ha per group. This comes to around 0.14 ha of forest per capita (DOF, 2009). There are about 52,000 grassroots women leaders (comprising one-third of the positions in CFUG committees), and there are about 5,000 women leaders in various chapters of CFUG federations (one-half of the leadership positions are reserved for women at village, sub-district, district and national level federations). Similarly, there are about 3,000 Leasehold Forestry Groups (LFGs) which have rehabilitated about 35,000 ha land by targeting about 30,000 households living in poverty.

1.1 Strengths and Weaknesses of Community and Leasehold Forestry

Table 1 characterizes the key features of community and leasehold forestry in the context of poverty targeting, and illustrates their respective strengths and weaknesses. Despite their strengths, both community and leasehold forestry have weaknesses in terms of policy provisions and the way they are being implemented through these programmes.

In leasehold forestry, poor quality forest land is allocated to the groups, transaction costs for poor people are high, and the activities supported are labour intensive. Moreover, the handing over process is centralised and, because the group consists of a separate group

of poor households, the process tends to indirectly contribute to further social segregation of these already disadvantaged households. Correspondingly, there is less emphasis on awareness-raising with the elite households and less social integration. Since poor households tend to be scattered and difficult to cluster into groups, their capacity to manage the leasehold forestry groups as an institution is limited. Poor household members tend to lack similar education levels as better-off households – again this contributes to limited capacity of such groups. In practice, it is anyway difficult to exclude elites. Leasehold forestry group membership is static – therefore, even if household poverty status improves or households change, they will be counted as leasehold households being tagged as “poor”. The legal rights of leasehold groups are weak or ill-defined, e.g. the inheritance position; their rights over naturally occurring trees; their situation after 40 years (lease expiry etc.). It is also seen that leasehold forestry is unable to address the dynamic nature of poverty through group membership.

Similarly, community forestry policies and processes also have a number of inherent weaknesses that constrain the community forestry programme in its poverty targeting attempts. Some examples of these are described here.

Community forestry has, for some time, been an ambitious Government of Nepal programme with dual goals of poverty reduction and environmental conservation. At the start of the programme in the late 1980's, there was greater focus on environmental protection (plantation establishment, forest protection and conservation etc.) and with correspondingly less emphasis on issues relating to gender, equity, poverty and social inclusion. Studies showed that following handover to com-

munities, there was an overall improvement in forest quality (Branney and Yadav, 1998; Gautam et. al., 2002; DOF, 2005; Kandel, and Neupane, 2007; Nagendra et. al., 2008; Luitel et. al., 2009; Pokharel and Mahat, 2009). Whilst monitoring was also able to show increased social benefits for the whole community, there was less evidence that individual households – especially poorer households – were benefiting from group membership. Because of this, it was thought likely that groups were at risk of becoming elite dominated with a tendency for them to reinforce the traditional power structures in rural communities. Also, since community forestry groups tend to be large and heterogeneous, they require a lot of initial investment, and there is a likelihood that group membership will result in disproportionately high transaction and opportunity costs for the poor, e.g. for attending meetings, patrolling forests, and taking part in voluntary labour in planting and protection activities. Further, since forest management is normally oriented towards longer-term benefits, e.g. timber, this again deprives poorer people of more immediate benefits that may be of more importance to them. Therefore, short-term benefits of community forestry group membership do not readily reach the poorest households.

Recognising these critical issues for poor and socially disadvantaged people since the mid-1990's, the community forestry programme has shifted its focus to specifically target poor and socially disadvantaged members of community forestry groups through better group governance, awareness raising, and by supporting group and household-based activities that bring specific benefits to the “identified poor”, i.e. those households identified through a process of participatory wellbeing ranking (which involves both the poor and non-poor member households). The commu-

nity forestry programme is now very specifically pro-poor (as reflected in the 2009 Guidelines for the Community Forestry Development Programme). Community Forestry User Group constitutions and operational plans are increasingly reflecting this pro-poor approach as they are revised with the support of social mobilisers and local resource persons. A number of pro-poor approaches and activities are now being widely used by community forestry groups including land allocation inside community forests for identified poor households for raising cash crops (fodder, medicinal plants etc.) and providing micro-credit for such households for establishing income generating activities and enterprises. However, these do require more time for negotiation (following wellbeing ranking), and on many occasions, they also face resistance from elites. Groups are now expected to utilise 35% of their income for pro-poor activities although, in general, group financial resources are still used for institutional and infrastructure development that benefit the whole community and not poor people specifically.

2. Impacts of Community based Forestry on Poverty Reduction and Rural Development

Nepal's community and leasehold forestry programmes have begun to show positive results in their contribution to social and human development, community infrastructure and poverty reduction by mobilising and utilising local forest and human resources. Nowadays, community and leasehold forestry groups are proving to be robust vehicles for cost effective community mobilisation, and many are now practicing a methodology that demonstrably reaches the poorest and most disadvantaged households which cannot be easily reached by other programmes. A study conducted in 2008 (LFP 2008) showed that community forestry was able to contribute to reduced income poverty and increased equity between poor and non-poor households and that it was in fact the second largest contributor (after remittances) to getting poor households to rise above the poverty threshold in rural areas. There are numerous examples of these approaches and activities, some of which are shown in the box below.

Table 1: Strengths of Community and Leasehold Forestry for Poverty Targeting

Leasehold forestry	Community forestry
<ul style="list-style-type: none"> ◆ Clear poverty reduction goal ◆ Individual land ownership within forest is empowering and gives status for poor households ◆ Smaller, homogenous groups ◆ Integrated approach moving beyond forestry to support agriculture, livestock and business ◆ Benefits are household focused rather than group-centred ◆ All households are usually involved in decision making ◆ Focus on IGA, savings and credit ◆ Funds mostly held privately rather than by the group ◆ Focus on short-term benefits from forest products, e.g. fodder, NTFPs 	<ul style="list-style-type: none"> ◆ Strong legal rights with autonomy to use forest resources ◆ Well established and widespread system ◆ Potential for social capital development of disadvantaged households within a wider group ◆ Networking strengthens individual groups ◆ More productive forest resources under group control as a basis for sustainable use ◆ An entry point for other development activities ◆ Devolved from most external controls ◆ Democratic decision-making process ◆ Groups increasingly recognised as strong grassroots civil society institutions ◆ Group membership is dynamic and flexible ◆ Groups often hold considerable self-generated financial capital

COMMENTS

COMMENT I

Integrating Environment, Poverty and Green Economy into National Planning Process

Prof. Bishwambher Pyakuryal¹

The paper elaborates the process of how the Periodic Plan is developed, including the action plan for sectoral ministries, which accommodates people's concerns and has a fixed goal, objectives, strategy, programme and budget details.

The schematic view of the Periodic Plan preparation process analyses economic and social aspects with a set of goals, priority settings and designing.

The schematic view of NPC's planning process extends to capture the need for integrating Poverty and Environment in the planning process. The only problem that has not been highlighted in the paper is the possibility of ownership problem of the plan document due to the failure in consensus-making between po-

litical parties. When political interests converge, economic plans survive; but when political interests diverge, economic policy making is completely stalled. Therefore, there is a need for organizing professional discourse on Nepal's political economy.

It is sad that the NPC has not considered the integration of the South Asia Development Goals, (SDGs – 2007-12). The SDGs identify a set of twenty-two goals. Of these, 8 are related to livelihood, 4 to health, 4 to education and 6 to environment. The reason that the SAARC Summit gave a mandate to the Independent South Asian Commission on Poverty Alleviation to prepare the SDGs was largely to inspire regional actions that are appropriate in South Asia's context and to add momentum to the national efforts towards achieving the MDGs.

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The paper discusses poverty-environment linkages from the MDGs. There is no denying that problems of poverty and social marginalisation are closely linked to environmental degradation – floods, rising temperatures etc. are the examples of environmental crisis. Therefore, this issue is heavily focused in global forums, including that during the G20 meeting. It was expected that the SDGs would be reflected in the development plans of the SAARC member countries.

The paper explains increasing economic development and employment through environmental opportunities. It also elaborates the poverty-environment nexus. Economic growth is necessary in reducing poverty and generating resources for human development and environmental opportunities. In this context, green economy is actually developing agriculture to obtain higher yield and increased income of the farmer without affecting the environment. Green Technology, for this matter, is considered to be environment-friendly technology that reduces environmental damages. Study shows that every 1% increase in per capita agricultural output leads to a 1.61% increase in the incomes of the poorest 20%. The technology that supported yield-increasing per hectare and labor releasing for employment in non-farm activities has contributed to rural income by raising the investible capacity of the farmer.

Bio-technology needs to be applied in agricultural processes. A genetic modification of micro-organisms through bio-technology has made agriculture competitive – viz., development of virus-free potato seeds, banana etc.

Agricultural technology adoption has a robust and positive effect on farm household wellbeing since sustainable agriculture integrates 3 goals:

- a) Environmental health
- b) Economic profitability
- c) Social and economic equity

The concern of green technology is the challenge to devise technology that will save the environment without sacrificing growth.

What is Green Economy

◆ Ways to increase economic development and employment through environmental opportunities include:

- Small scale natural resource based enterprises (e.g. NTFPs, tourism, renewable energy etc.) and urban employment (waste management)
- Public works programmes for natural resource management (e.g. water, soil and forestry conservation) and urban management (waste management)

Recommendations

Why poverty environment, climate issues for the planning and budgeting

- ◆ Development programmes should be re-designed to take account of climate risks
- ◆ More investment in environment issues that matter to poor people – environment health, better natural resource management – is required
- ◆ Rural road investment must be economic – less bulldozer roads and more labour based environmentally friendly roads
- ◆ Public works programmes that promote natural resource management

Climate Screening, Adaptation Actions, Financing and Policies: Essentials for Improving the Livelihoods of the Poor

Bishwo Nath Tiwari¹

The paper is well organised and articulated. It moves gradually, tracing the development in the subject of global warming and climate change. It covers most of the constituents of climate adaptation. However, there is some scope for further improvement. These comments fill in the gap in each of the 8 sections of the paper. Overall recommendations are also provided.

The first section, the Background section, traces the history with regard to addressing global warming and climate change.

The second section briefly talks about the impact of climate change in Nepal. However, it does not mention its effect on agriculture, the sector on which four-fifths of Nepal's poor depend on.

The third section documents the measures that have been taken so far in the field of mitigation and sustainable development. This, however, documents only the efforts of the government and not those of communities and individuals at large. The paper mentions the user groups approach adopted in forestry, water and other sectors. It does not recognize the informal efforts of risk mitigation such as the diversification of income sources and self-insurance mechanism and other informal insurance mechanism adopted by the communities and households though. Nor does it touch on the spontaneous initiatives such as

farmer-managed irrigation system implemented with the self-initiation of communities or users.

This third section talks about the recently introduced concept of climate screening. The section is very brief, and does not distinguish it with the Environmental Impact Assessment or the Initial Environmental Examination, which Nepal has adopted since the early 1980s, especially in the hydropower sector.

The fifth section of the paper summarizes the National Programme of Climate Adaptation, which mainly focuses on prioritized programmes and the costing worth of USD 350 million. However, it does not explain the time frame.

The paper talks about financing and policies in sections six and seven while the final section is the conclusion, which lays emphasis on the need for a pro-rich approach so as to make people rich and thus improve their capacity for coping and adaptation.

On the issue of financing, the paper points that US 10 billion is pledged for climate adaptation by developed countries, and so Nepal is going to get funds for adaptation activities as it is one of the 15 most vulnerable countries. There is no guarantee that Nepal will get adequate funds unless there are strategies to acquire them. There is a need for developing strate-

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gies and policies as to how USD 350 million dollars is to be raised for climate adaptation. There is a resource crunch. The developed countries have not contributed even 0.7 per cent of their GNI for attaining the MDGs.

In the policies and programme section, I have some more suggestions for which I draw upon the four “i’s” fundamental to climate change adaptation.

First, **information for effective planning and monitoring**: there is gross paucity of data on effective environmental planning and monitoring. Unless we have adequate information, we cannot plan well, implement policies and programmes well, and evaluate the work.

Second, **infrastructure for climate proofing**: the paper or other follow up exercises have to point out infrastructure, which are of the utmost need for climate adaptation. For example, dike in the Koshi River for the protection of human lives, and reduction of losses in agriculture.

Third, **insurance for social protection**: for the poor man, managing risk is a matter of life and death. Therefore, he needs social protection. Policies should focus on social protection mechanism and programmes for the poor and vulnerable.

Lastly, **institutions for risk mitigation**: most of the risks are of co-variant types; they need proper institutions to address climate change and its consequences. We all are aware of the fact that Nepalese planning and plan of actions fail due to weak governance or poor implementation. Therefore, strong, well-performing and corruption-free organizations are a necessity.

One of the key messages of the 2009 Global Assessment Report on Disaster Risk Reduction is that by addressing the drivers of disaster risk, we can reduce poverty and adapt to climate

change. These disasters are increasing urbanization, increasing corruption, weak service delivery, vulnerable rural livelihoods, and decline of the ecosystem. The paper pays less attention on these drivers.

Recommendations

- (i) There is a gross lack of data on the impact of climate change or the impact of disaster risk. In view of this, it is difficult to make effective planning and monitoring of the programmes on disaster risk reduction, mitigation or climate change adaptation. Therefore, it is recommended that data on disasters risks and their impacts be collected on a regular basis.
- (ii) There is need for implementing targeted programmes focusing on the extreme poor so that they can cope with the negative impact of climate change. Most of the poor are agricultural laborers or small peasant holders; the impact of climate change affects both of them. Therefore, separate targeted programmes need to be implemented for the improvement of their livelihoods.
- (iii) Improve infrastructure and services so as to improve the coping capacity of the disaster prone communities on the one hand, and reduce disaster risk on the other.
- (iv) Nepal has negligible carbon emission compared to its neighbors and other developed countries. On the other hand, it has been expending its protected areas. The benefits of such a protection are global whereas its opportunity cost in terms of foregone benefit is local. Therefore, Nepal has to make a strong argument to garner international support for poverty reduction and disaster risk management.
- (v) Of all the measures, improving governance is a must. We are good in planning but lack implementation. This requires a proper incentive structure.

Economic Analysis of Local Government Investments in Rural Roads: Reducing Poverty through Managing Climate and Environment Risks

Chandra Mani Adhikari¹

The paper presented by Dr. Koirala is comprehensive. Factors that favour the choice of improper method and time, methods and cases, economics of heavy equipment, construction and maintenance costs, indirect and environments costs, benefits from road, unaccounted and financial benefits and recommendation are incorporated; here suggest to add my comments too.

1. Economic growth is the basis for poverty reduction. But for poverty reduction in developing countries, the growth should be broad based and directed towards the promotion of economic activities in rural areas. Poverty is a multi-dimensional issue involving social (basically related to health and education), economic, employment, cultural and geographical, traditional (generation transmission) and behavioral aspects. To properly address the issue of poverty, the model of economic growth should be appropriate to incorporate all these poverty concern dimensions. In other words, the growth should be able to address issues that will maximise poor people's accessibility to socio economic services like health, education, sanitation, drinking water, skill development, employment, and credit and market. Moreover, the vulnerability of the

poor to economic shocks and natural disasters must be reduced to enhance their wellbeing and encourage investment in human capital and in higher-return activities. Public policy reforms and investment in physical infrastructure will significantly contribute to the pursuit of socially inclusive development, especially through the availability of road transportation. In Nepal, too, the development of road transportation has shown multiplier results from health and education to production and market linkage that have increased opportunities for self employment, income generation and learning new things. For example, the development and expansion of vegetable farming around the Kathmandu Valley has uplifted the living standard of rural people in the surrounded districts. Another example is the road connectivity with Mustang which has made possible the easy entry of Mustang apples into markets in Pokhara and Kathmandu.

2. The point mentioned above shows the significance of roads for the socio-economic transformation of the people. Therefore, before constructing a road in any VDC or DDC, a master/periodic plan should be prepared considering all socio

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economic activities in the location and their future potentials and scope. These include aspects like major production in the area and its marketplace, educational and health institutions, major farming area, irrigation infrastructure, rural animal moving track, forest area linkage paths and tracks, cultural and religious centers, public (and playing) ground, location and flow of streams and rivers, and physical structure of the land. These factors will serve as a guide for the location, size and structure, length and load capacity of the roads. If this approach is ignored, it may sometimes have a negative impact, and instead of reduction of poverty, poor people may be more negatively affected and they may lose their jobs and incomes. Furthermore, instead of bringing about redistribution of resources, such roads may cause the resources to be siphoned into the pockets of a limited number of people. In Mustang, for example, the same happened at the Muktinath track, and the earning has been diverted to the owners of bus and motorcycle service operators with local wage earners and micro level shops and stalls in the trekking area losing the income they had before the road construction. So, the options and alternates should also be developed simultaneously.

3. Rural roads construction has emerged as a priority sector for local bodies; out of the total budget expenditure, the share spent on road ranges from 22-46 percent, which is relatively more in the Terai area. At the VDC level, road construction comes at the top followed by electrification. But the total project costs are not scientifically projected; sources of funding are not properly identified. Due to all these, many rural roads are incomplete.

Before starting any road project, it should be clear as to what type of road is going to be built – up-rural road or highway (not confused as the Banepa-Bardibas Road) – since the overall framework of each type of road will be different, from design to construction to load estimation to life projection.

4. Linkage with highways should be established for accessibility to district, regional, national and international markets.
5. The roads should be technically viable. Presently, however, road construction has been initiated haphazardly. Technical aspects like the physical structure of the land, width in turning points, and load bearing capacity are ignored so that rural roads invite accidents and loss of lives. Operation and maintenance related arrangements are given low priority. As a result, rural roads are being the cause of soil erosion, landslides and accidents during the rainy season in some places. The need for bridges and sub-bridges are also not properly assessed.
6. Although the participation of the local people has been increased relatively, marginalised and target groups are still not as active as desired. They are less aware about the socio, economic, environmental and
7. So, I would like to add on the following to the paper presented by Dr. Koirala:
- 7.1 Rural road planning and construction should be done using an integrated approach, taking into consideration socio-economic, technical, security (social and physical) concerns, environmental, and psychological development issues.

- 7.2 Presently, technical, and construction and maintenance of bridges, sub-bridges and culvert-related parts as well as environmental and biodiversity conservation are ignored.
- 7.3 So as to keep labour based roads in top priority, relatively more participation of the people and establishment of Rural Road Access related projects and designing guidelines are good things.
- 7.4 Poor fund management and poor budgeting, increasing fiscal fiduciary risks at the local level, poor implementation, ignorance of financial discipline and technical and engineering issues, less attention to the interests of the poor and their livelihood related issues are the weaker parts of this sector that need to be corrected.
- 7.5 Measures recommended:
- ◆ Be clear about the approach of rural infrastructure development, including roads
 - ◆ Specify the sources of funding and its modality while designing the budgetary framework; enforce financial related laws and regulations
 - ◆ Be aware about technical and environmental issue (for this, the MoLD and NPC should take the initiative of providing technical assistance and capacity development to Local Bodies)
 - ◆ While constructing, a mixed approach (not fully labour based and not fully heavy equipment based) should be adopted as per the cost and technical aspects
 - ◆ The operation and maintenance should always be considered while planning, designing and constructing roads
 - ◆ Rural infrastructure and its significance in livelihood should be included in the curriculum of school education
 - ◆ Alternative options for displaced households, communities and groups due to rural road constructions should be developed through employment, income and land
 - ◆ Finally, **consider this point**: Roads should be pro-poor, resource adequacy based, environment friendly, technically viable, risk free, inclusive and market friendly

COMMENT IV

Local Government Revenue Raising from Natural Resources: How better Natural Resources Management can Increase Local Tax Revenues in Nepal

Chandra Mani Adhikari¹

1. The fiscal structure of Nepal is composed of central and local expenditure and revenue. Against many piecemeal efforts on decentralization, the ratio of local expenditure in total and the ratio of local revenue in total are 8 percent and 5 percent respectively (2005/06). The LSGA 1999 has specified expenditure and revenue assignments. However, expenditure and revenue decentralization remain unclear due to overlapping and less clarity in definition and right assigned related to revenue base and rate.
2. Revenue assignment and its operational details are guided by the LSGA 1999 and LSGR 2000. At the local level, the DDC, as the first tier, has been given revenue rights with definition and base of revenue. It may charge fees and charges for services. Prior to formulating the annual plan, the DDC prepares the estimation of sources and means to be obtained. The most important local revenue are based on use of infrastructure, on business, use of natural resources, tax on exports from the district, and tax on reusable and recycled goods. It is also entitled to collect revenue from sales of land and forest resources. However, the revenue collection level of Local Bodies is very low.
3. The municipalities collect 16 types of taxes. In most cases, the rate caps are defined by law. Similarly, VDCs are entitled to collect 12 types of taxes, including tax on use of natural resource. But the share of revenue from internal sources is not more than 10 percent out of total income, including grant. Thus, local bodies are heavily dependent on grants and transfer.
4. Out of the total internal revenue, the revenue collected by local bodies from the mobilization of natural resources is nominal although DDCs are entitled to levy tax on natural resource utilization with respect to the use of wool, turpentine, herbs, worn and torn goods, stones, slates, sands, bones, horns, wings and leather (mining and livestock based products). Another type of revenue based on natural resources is sharing of mining royalty (50%), tourist entrance fee (30%), royalty from forestry products (10%), and from hydro electricity (50%), and the utilization of revenue has been approved having all these provisions. The enforcement and implementation of authority provided by the law, however, are very weak. While observing the data for the FY 2006/07, out of the total revenue (including grant), the

¹ Chairperson of Citizen Investment Trust.

share of the total internal revenue of Local Bodies is only 28 percent. Out of the internal revenue, the proportion of internal earning and sharing is 45:55 percent with 40 percent being covered by natural resources based revenue (out of 100%). The amount of revenue based on natural resources generated by VDCs is nominal, and the internal revenue is dominated by fees and charges on services.

5. Based on this ground reality, the enhancement of revenue generation in the future under a federal structure is very challenging. So, being farsighted, revenue mobilization should be managed using an integrated approach. The revenue mobilization from natural resources should be associated with the overall development of local government. In this regard, while identifying the needs and formulating the plans and programmes in addition to expenditure functions, the revenue part should be considered. This means that mobilization of revenue should be based on the use of resources; the resource potentiality should be based on its availability, its conservation and protection, maintenance and rational exploitation as well as its scientific disposal.

6. While talking about natural resources and revenue generation, the conservation part of natural resources is equally important. In the Nepalese context, it is not only mining and forest based resources that are significant but also agriculture and livestock for directly and indirectly generating revenue. For example, the production, processing and sales of cardamom, tea, rudraksha, banana, bamboo, nuts, MAT, herbs, milk etc. may create a significant volume of economic transactions that will contribute to employment, income generation and revenue yield either directly or indirectly.

Presently, the trend of collecting revenue from the extraction and use of natural resources (especially mining based like sand, stone, gravel, rock, pebbles etc.) has increased. Extraction of natural resources and revenue collection are commonly practiced in unstable slopes, marginal land, road sides, river beds and forests. This type of practice has led to massive environmental damage and led to floods, landslides, erosion etc. The vulnerable groups of the rural society such as poor men, women and children; marginalized communities; and landless people have been the most common victims to natural disasters brought about by such activities which have also had tremendous impact on the quality and quantity of natural resources. These resources are used as the raw materials in construction of physical infrastructures. But sound policy and sustainable mechanism are lacking to use them in practice. No one-door system of extracting natural resources, and collecting and sharing revenue from them at the Local Body level exists. There are conflicts in policies between the institutions mandated for revenue generation and collection (e.g. controversial provisions in the Forests Act and the LSG Act).

7. So it is suggested that natural resources be included in the revenue generation plan. These resources are the base of enterprise development, especially SMEs. Development of SMEs will help to generate employment, income and revenue. Therefore, the development of programmes should be associated with generation of revenue as well as ownership preservation, exploration and disposal of resources for revenue generating purpose. Value addition is another important issue – more value addition means more revenue generation, more revenue generation means more investment in the

pro-poor sector (it is a never ending cycle). National parks may provide significant amount of revenue at the national as well as the local level.

Recommendations

8. Therefore, for raising revenue from natural resources under a better management framework and pro-poor programmes and actions, the following steps are suggested to be incorporated in addition to the points outlined by the paper presented by Mr. Som Lal Subedi, Joint Secretary, MoLD:

- ◆ Develop programmes related to revenue generation on the basis of plan designed for the conservation and management of natural resources and use these optimally as per the geographical location-specific strategies and the resource mobilization capacity and potentiality of different categories of VDCs in line with the proposed 14 provinces (by SR Committee) since the existing revenue generating capacity of VDCs ranges from Rs. 2,000 to Rs. 1,250,000 per annum
- ◆ Be clear about the management and mobilization of natural resources under a federal structure based local government through their effective and sustainable utilisation for the sake of poor people and revenue generation under the desired framework (since the NPC document approach on this matter is silent)
- ◆ Be clear about the assignment of natural resources and revenue generation through them at different levels of government under a federal structure (as per the significance of natural resources at various levels – from federal government to community level)
- ◆ Preserve the rights of the poor while mobilizing revenue and encourage them to conserve and preserve natural resources

- ◆ Design the revenue policy as per the nature of natural resources, whether renewable or not (Forest based, Agriculture based, Mining based, Herb based, Power – water/ hydro/ wind based, bio-electricity)
- ◆ Map the revenue potential resources as per geographical features, and prepare conservation and utilization PLAN with the active participation of local governments and the community (e.g. Silwalik sector is potential for cement based mining resources, specifically in Dang, Udaypur and Makawanpur)
- ◆ Develop long term value addition plan and programmes in line with natural resource potentials
- ◆ Stop deforestation, especially in the Terai and Silwalik area
- ◆ It should be always be borne in mind that revenue is not only a local issue; increment of central revenue helps bring in additional revenue at the local level too
- ◆ That natural resources should be managed for future generations rather than the present, for the poor rather than the rich, for income generation and employment with value addition rather than direct disposal or sale at low par value, for tax revenue rather than sales, should be given careful consideration
- ◆ Revenue policy should be designed as per the specific features of Local Bodies, base of natural resource mobilization, and revenue to be assigned to people closest to the government. Proper linkage between natural resources, revenue and climate should also be established with better harmonised action to be taken by local governments in terms of revenue/expenditure, natural resource management, climate change adaptation and mitigation
- ◆ Correlate the expenditure functions and revenue assignments with basic functions: Planning, Regulation and Institutional Management

- ◆ To achieve the goal of poverty reduction through revenue generation at the local level with optimum and rational utilization of natural resources by mitigating the negative impact of climate change, all stakeholders and agencies, including donor partners, should conduct various activities by working together under a joint-effort approach with high focus on the implementation part. Country specific guideline should be developed.
 - ◆ Be serious about policy matters and maintain policy consistency; and develop policy guidelines, procedures and norms to avoid policy gaps and conflicts in resource extraction, use, revenue generation and sharing
- Finally, the revenue mobilization from natural resources should be associated with the overall development of local governments. In this regard, while identifying needs and formulating the plans and programmes in addition to expenditure functions, the revenue part should be considered not only by focusing on harvesting but with emphasis also being given to plantation and other revenue generation activities like enterprise development.

COMMENT V

Community Based Forestry and Climate Change: Implications for Environment and People Living in Poverty in Nepal

Bishwo Nath Tiwari¹

Community forestry has been implemented since 1978 with the handover of forest to the community. The community was thus made responsible for the management of the forest. The concept of poverty reduction and restoration of the eco-system through leasehold forestry was put into practice by implementing Hills Leasehold Forestry and Forage Development Project in Nepal since 1992. Under the project, a patch of degraded forestland is given to user groups for management. As the project has been operating for a long time, it has been imperative to evaluate its impact and offer lessons. A major evaluation has

Both community forestry (CF) and leasehold forestry (LHF) have similar objectives:

- (i) Environmental conservation
- (ii) Poverty reduction

However, their impact could be different whereas they are combined together in the presentation. Their impacts could be different because:

- (i) Community forestry was implemented since 1978, whereas leasehold was implemented since 1994
- (ii) CF has a large coverage compared to LF
- (iii) CF has better forest biomass during handover whereas LF does not
- (iv) Any one in the community can be a member of community forestry but not that of leasehold forestry

- (v) The pay-off time period of CF is low whereas that of LF is high
- (vi) The user committee of CF is diverse whereas that of LF is not
- (vii) CF is a general poverty reduction programme whereas LF is a targeted poverty reduction programme – the main difference
- (viii) In view of climate adaptation and risk mitigation, CF has a greater role than LF now.

The presentation shows that:

- ◆ Higher the tenurial security, lower the ecological performance. Is this because of the poor governance of the government?
- ◆ The presentation has a generalization, giving the impression that leasehold forestry has already conserved the forests, and increased the biomass and reduced the forestry. In fact the return varies with the time when the degraded forest was handed over. The pay off of the degraded forest handed over in 2004 in general is better than those handed over recently.
- ◆ Moreover, unlike community forestry, the regeneration of different kinds of capital under leasehold forestry is low
- ◆ The presentation points out that community forestry and leasehold forestry provide low benefit in terms of mitigation and high benefits for climate adaptation. This seems contradictory because with the regeneration of the forest, the carbon sequestration

¹ Professor at the Central Department of Economics, Tribhuvan University, Kirtipur, Kathmandu, Nepal.

capacity increases. Moreover, climate adaptation strategies could extend beyond forest regeneration, as it is a response to the shock generated by climate change.

- ◆ Under the community and leasehold forestry, the forest is managed by the communities and their groups, and it is they who are given the right to use forest resources. However, the presentation argues in favour of offering tenure status to the communities. But it does not make clear what type of tenure status.

There are some issues and challenges in leasehold and community forestry, chief among which are:

Conflict between Community and Leasehold Forestry

With the successful implementation of the Community Forestry Programme in Nepal, the HLFFDP has been implemented. However, after a decade of implementation, it has been realized that there is some sort of **conflict between the community forestry and leasehold forestry programmes in Nepal**. There are studies suggesting that the poverty aspect of the leasehold forestry approach can be included in the community forestry programme. Thus, they suggest that a separate leasehold forestry programme is not warranted.

On the other hand, there are studies revealing that the community forestry programme is not pro-poor and is not targeted. Moreover, it does not focus on the economic aspect. Therefore, these studies justify for the HLFFDP, which targets the poor.

However, as the HLFFDP targets the poor, there is conflict between those who are the project beneficiaries and those who are not. Using case studies in the middle hills of Nepal, an investi-

gation was made on the interactions between the leasehold forest user groups and the dependent community which is not included in the programme. It has been revealed that there is a high degree of social conflict between users and non-users with an increase in forest degradation. Moreover, it has also been found that poor and marginalised people are excluded from the benefits of the HLFFDP.

Forest Policy in favour of Community Forestry
The Forest Policy is in favour of the Community Forestry Programme. According to the Forest Act 1993, community forestry gets priority over leasehold. There is no legal mechanism to form leasehold forest user groups like community forest groups. Moreover, smaller the group size formed under the HLFFDP is vulnerable, and faces tremendous managerial problems.

In view of the above, the following are the recommendations:

- (i) Both community forestry and leasehold forestry should complement each other rather than work as rivals
- (ii) Effective monitoring of the leasehold forestry is necessary so as to make it an effective pro-poor programme
- (iii) Both community forestry and leasehold forestry can regenerate forest resources whose benefits extend beyond Nepal. Therefore, the government should be able to put forth arguments for larger grants from other countries for climate adaptation in view of Nepal's low carbon emission and larger amount of forest resources generated as a result of the community and leasehold forestry programmes.
- (iv) Community and leasehold forestry should serve as poverty reduction programmes.
- (v) The government should support these two programmes and mobilize communities and their resources for the benefit of the communities and the country.

APPENDICES

APPENDIX I

List of Participants (18 November 2010)

S.N.	Name of Participants	Designation	Organization
1	Dr. Jagadish C. Pokharel	Vice Chairman	NPC
2	Dr. Dinesh C. Devkota	Member	NPC
3	Mr. Atma Ram Pandey	Act. Secretary	NPCS
4	Mr. Gopi Nath Mainali	Joint Secretary, Infrastructure Division	NPCS
5	Mr. Pushpa Lal Shakya	Joint Secretary, Economic Management Division and NPD, SPMC-NPC	NPCS
6	Mr. Ramesh K. Dahal	Coordinator	NPCS
7	Mr. Krishna Gyawali	Secretary	MoLD
8	Mr. Som Lal Subedi	Joint Secretary, Local Self-Governance Coordination Div., MoLD and NPD, LGCDP	MoLD
9	Mr. Yam Nath Sharma	Under Secretary	MoLD
10	Dr. Sumitra Amatya	General Manager	SWM
11	Mr. Pradeep Amatya	Chief, Environment Section	LS MC
12	Mr. Moti Bhakta Shrestha	Chief, Environment Section	Bhaktapur Muni.
13	Mr. Krishna P. Acharya	Joint Secretary/Chief Planning Division	MoPP&W
14	Mr. Batu Krishna Upreti	Joint Secretary, Climate Change Mgmt. Div.	MoE
15	Mr. Krishna P. Acharya	Joint Secretary	MoFSC

S.No.	Name of Participants	Designation	Organization
16	Mr. Raj Babu Shrestha	Executive Director	PAF
17	Mr. Avishesh Neupane	Environment Officer	PAF
18	Dr. Narayan Chaulagain	Executive Director	AEPC
19	Mr. Raju Laudari	Manager of Climate & Carbon Unit	AEPC
20	Dr. Dinesh Bhuju	Faculty Chief	NAST
21	Prof. Dr. Madan Koirala	Asst. Dean, Faculty of Environment	TU
22	Dr. B. Pyakuryal	Professor	TU
23	Dr. Bishwo Nath Tiwari	Professor	TU
24	Dr. Ram Chandra Bhattarai	Associate Professor	TU
25	Dr. Jishnu Subedi	Associate Professor	IOE/TU
26	Dr. Mahesh Banskota	Dean, School of Arts	KU
27	Dr. Govinda Koirala	NRM, Economist	Freelance
28	Mr. Chandra Mani	Chairman and Lead Commenter	CIT
29	Mr. Tulashi P. Adhikari	Documentation Officer	FECOFUN
30	Mr. Bishnu Thakali	President	WPECO
31	Mrs. Ranju Khanal	Chairperson	WD & CDA
32	Mr. Shyam Upadhaya	Consultant	IIDS
33	Mr. Shankar Aryal	Research Fellow	IIDS
34	Dr. Amod Dixit	Executive Director	NSET
35	Mr. Jorn Sorensen	Deputy Country Director - Programme	UNDP
36	Mr. Vijay Singh	ACD, EEDM Unit	UNDP
37	Ms. Dibya Gurung	PO, EEDM Unit	UNDP
38	Mr. Paul Steele	Advisor	UNDP APRC Bangkok
39	Mr. Bruce Pollock	Process Mgmt. Implementation Specialist	LGCDP/UNDP
40	Dr. Hari Pradhan	National Project Manager, SPMC-NPC	UNDP/NPC
41	Dr. Mohan Wagley	Advisor	UNDP/PEI
42	Mr. Mukunda Raj Pandeya	Consultant	SPMC-NPC/PEI
43	Mr. Dol Bdr. Kuwar	Admin/Fin. Associate	SPMC-NPC
44	Mr. Barry J. Hitchcock	Country Director	ADB, NRM
45	Mr. Govinda Gajurel	Consultant	NPC/ADB
46	Dr. Mani Nepal	Environmental Economist	SANDEE
47	Dr. Shailendra K. Jha	National Project Manager, PIPRCM & SR Project	ILO
48	Mr. Peter Nok	Regional Coordinator	IUCN
49	Mr. Rajendra Khanal	Chief	IUCN
50	Dr. Bharat Pokharel	Project Director, NSCFP	SDC

S.No.	Name of Participants	Designation	Organization
51	Mr. Peter Branney	Advisor, NSCFP	LFP/DFID
52	Mr. Ugan Manandhar	Program Manager	WWF
53	Mr. Sandesh S. Hamal	Policy Coordinator	CARE/Nepal
54	Mr. Dinanath Bhandari	Project Manager	Practical Action CECI
55	Mr. Madhu B. Karki	FTL	
56	Mr. Kiren K.C.	PO	NTNC
57	Mr. Roshan Shrestha	Reporter	Press
58	Mr. Bishnu Tamrakar	Reporter	WAFA
59	Mr. Lok Nath R.	Reporter	Aarthik
60	Mr. Anant Anurag	Reporter	Nepal 1 TV
61	Mr. C. B. Adhikari	Reporter	RSS
62	Mr. Dinesh Bishokarma	Reporter	RSS
63	Mr. Amit Adhikari	Reporter	Himalaya TV
64	Mr. Sushil Baskota	Reporter	Himalaya TV
65	Mr. David M.	Reporter	National News
66	Mr. Kedar S.	Reporter	Metro Online
67	Mr. Chandra Man Dongol	SPMC-NPC Project Staff	SPMC-NPC
68	Mr. Krishna Dongol	SPMC-NPC Project Staff	SPMC-NPC
69	Mr. Mahendra Bhattarai	SPMC-NPC Project Staff	SPMC-NPC

APPENDIX II

Programme Schedule

08:30 – 09:00	Registration	
Inaugural Session		
09:00 hrs.	Session Chair	Dr. Dinesh C. Devkota Hon'ble Member National Planning Commission
09:00 – 09:05	Welcome Remarks / Objectives of the Workshop	Mr. Gopi Nath Mainali Joint Secretary Infrastructure Dev. Division NPCS
09:05 – 09:10	Remarks	Mr. Jorn Sorensen Deputy Country Director Programme, UNDP
09:10 – 09:15	Remarks	Mr. Krishna Gyawali Secretary Ministry of Local Development
09:15 – 09:25	Opening Remarks	Dr. Jagadish C. Pokharel Hon'ble Vice Chairman National Planning Commission
09:25 – 09:35	Remarks	Dr. Dinesh C. Devkota Hon'ble Member National Planning Commission Secretariat
09:35 – 09:40	Vote of Thanks	Mr. Atma Ram Pandey Officiating Secretary National Planning Commission Secretariat
09:40 – 10:10	Tea/Coffee Break	

Morning Session

Inclusive National Development :
Need for Pro-poor Environment and Climate Resilience Policy

Session Chair

Mr. Krishna Prasad Acharya
Joint Secretary
Ministry of Physical Planning & Works

10:10 – 10:30	Integrating Environment, Poverty and Green Economy into National Planning Process	Mr. Pushpa Lal Shakya Joint Secretary Economic Management Division NPCS and NPD, SPMC-NPC & Mr. Gopi Nath Mainali Joint Secretary Infra. Dev. Division NPCS
10:30 – 10:50	Recommended Climate Policies and Investments from the National Adaptation Programme of Action and Climate Screening from Investment Projects with Focus on Safeguarding Pro-poor's Livelihood	Dr. Ganesh Raj Joshi Secretary Ministry of Environment & Mr. Batu Krishna Upreti Joint Secretary and Chief Climate Change Mgmt. Div. Ministry of Environment
10:50 – 11:10	Upland Poverty: Examining Causes, Identifying Solutions	Mr. Raj Babu Shrestha Executive Director PAF
11:10 – 11:25	Comments from the Lead Commentator	Prof. Bishwambher Paykuryal TU
11:25 – 12:20	Discussion	
12:20 – 12:30	Remarks by the Session Chairman	Mr. Krishna Prasad Acharya Joint Secretary Ministry of Physical Planning & Works
12:30 – 13:30	Lunch Break	

Morning Session

Local Level Policies and Practices for Pro-poor Development

Session Chair

Mr. Krishna Gyawali

Secretary

Ministry of Local Development

13:30 – 13:50	Local Government Expenditure and Rural Roads: Economics of Reducing Poverty While Managing Climate and Environment Risks	Dr. Govinda Koirala NRM Economist
13:50 – 14:10	Local Government Revenue Raising from Natural Resources: How Better Natural Resources Management Can Increase Local Tax Revenues	Mr. Som Lal Subedi Joint Secretary Local Self-Governance Coordination Div. MoLD and NPD, LGCDP
14:10 – 14:20	Comments from the Lead Commentator	Dr. Chandra Mani Adhikari Chairman CIT
14:20 – 15:00	Discussion	
15:00 – 15:20	Alternative Energy Linking Climate and Environment Consideration: Implication on the Improved Livelihood of the Poor	Dr. Narayan Chaulagain Executive Director AEPC
15:20 – 15:40	Leasehold Forestry and Community Forestry: Implications for the Poor, Environment and Climate Change	Dr. Bharat Pokharel Project Director NSCFP, SDC & Mr. Peter Branney Programme Advisor LFP/DFID
15:40 – 15:50	Comments from the Lead Commentator	Prof. Bishwo Nath Tiwari TU
15:50 – 16:30	Discussion	
16:30 – 16:40	Remarks by the Session Chairman	Mr. Krishna Gyawali Secretary, MoLD
16:40 – 17:00	Summing-up of the Day	

Closing Session		
17:00 – 17:05	Remarks by	Mr. Barry J. Hitchcock Country Director ADB, Nepal Resident Mission
17:05 – 17:10	Closing Remarks by	Mr. Krishna Gyawali Secretary Ministry of Local Development

APPENDIX III

Speech by Jorn Sorensen, UNDP Deputy Country Director-Programme Environments of the Poor in the Context of Climate Change and the Green Economy 18 November 2010

Dr. Jagadish C. Pokharel

Hon Vice Chairman of the National Planning Commission

Dr. Dinesh C. Devkota

Hon Member, National Planning Commission

Mr. Krishna Gyawali

Secretary, Ministry of Local Development

Thank you for hosting this important workshop – particularly given your pressing duties with the national budget to be presented tomorrow.

Welcome participants from government, civil society and private sector

The objectives of this workshop are twofold:

- ◆ Make recommendations to the National Planning Commission for their next Periodic Plan
- ◆ Make recommendations to the Ministry of Local Development to strengthen the decentralisation process

The focus of this workshop is a green economy. How will greater attention to climate change and natural resource management generate fast growth for Nepal?

Why will ignoring climate and natural resources undermine and slow down Nepal's growth?

Climate change poses a major risk to many development projects and programmes. To maximise growth, both NPC and MoLD can

play a key role to pay more attention to climate change in the planning and budget process. The NAPA or National Programme of Action for Climate Change has been developed. But its key recommendations and proposed programmes need to be included in the Periodic Plan and in District Development Plans.

A key example of this link between growth and climate change are rural roads. Roads are vital to improve access to markets and so reduce poverty and generate growth. The upcoming budget and many VDC funds are being spent on roads. These are useful and important investments.

But there is a danger that many of these investments are not economically the best choice. We have all seen roads that are "bulldozer roads" made with no proper planning, engineering or design specifications. These roads are often washed off within a few months and are only usable during the dry season. These roads also contribute to landslides. This trend of roads being washed away will only increase with climate change.

We have seen these roads, but today some actual economic analysis will be presented that we have supported with MoLD reviewing past road investments. This shows in hard economic figures that these bulldozer roads have a much lower rate of return than better planned, labour based roads. Even though they are more costly in the short run and take longer, labour based roads last much longer. So labour based roads have an internal rate of return that is 30% higher than heavy equipment based roads. This is an important finding for NPC and MoLD to act on in the budget process.

The final area I want to highlight is natural resources extraction and its links to growth and investment. Natural resources, particularly sand, rock and gravel, are vital sources of local

government revenue. In some areas, they are as much as one third of the local budget. But here again, the best economic decisions are often not being made.

Extraction of these resources is often being allowed too quickly and is imposing other costs on the local community. These costs of river erosion will again worsen with climate change and cause more disasters. There needs to be more careful management of natural resource extraction to generate future revenues and avoid unwanted costs to VDCs and DDCs.

By paying more attention to these areas of climate and natural resource management, Nepal can generate faster growth for all its people.

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