



Workshop Proceeding

“Community-based Forestry and Livelihood in the context of Climate Change Adaptation in South Asia”

9-10 December, 2012

Lalitpur, Nepal

Prepared by

ForestAction Nepal

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Acknowledgement

We, ForestAction Nepal, would like to express our gratitude towards the Asia Pacific Network for Global Research for the financial support. We would like to thank the presenters during the seminar for their time and sharing valuable insights that came out from their research. We also thank the resource persons from ForestAction Nepal for their support during the seminar.

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About the workshop

This workshop is a part of the activities of the research on climate change adaptation supported by the Asia Pacific Network (APN). The programme was organized and managed by ForestAction Nepal in collaboration with the Hue University of Agriculture and Forestry, Vietnam, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Bangladesh and the Asian Institute of Technology, Thailand.

The seminar aimed to share the lessons/insights on community based adaptation to climate change from diverse localities in four South and South-east Asian countries. The seminar was conducted with the presence of diverse participants representing Academia, International/Non-Governmental Organization, Government Organization and Researchers.

Objectives of the seminar

The major objective of the seminar was to disseminate the research findings conducted in four Asian countries- Nepal, Bangladesh, Thailand and Vietnam and strengthen the network among the researchers and partner countries. Besides, the seminar aimed to discuss the further steps in order to strengthen climate change research in partner countries and upscale the findings among wider audiences.

The program

Dr Naya Sharma Paudel from ForestAction welcomed the participants and Dr Dharam Raj Uprety shared the overall objective of the workshop. The program was scheduled for two days (annex A). Day one was observed by introduction to the program, paper presentations and discussion over them. On the following day, a field visit to Sano Gaun Community Forest in Kavrepalanchowk District was organized to understand the forest management practices by the community.

A total of eight papers were presented in the seminar and out of those presented, four papers was an outcome of the APN research conducted in the four Asian countries. While the remaining four papers came from different academic and research institutions. Name of the participants is attached in annex B.

Background and Rationale

Climate change is having a profound impact in most of the geographical locations. Climate change is exhibited in the form of rising temperatures, erratic rainfall patterns, damage of the crop varieties, and decline in the water bodies among others, which poses risk to the livelihoods of the poor and vulnerable societies around the globe. The effects of climate change are expected to deepen poverty and adversely affect livelihoods (Gaire *et al.* 2008). With the increasing climate change impacts, the developing countries are still being unable to adapt to the changing environmental context. Moreover, lack of proper institutional setups and their capacities has further hindered the adaptation processes at the local level.

The Inter-governmental Panel on Climate Change (IPCC) defines climate change adaptation as adjustment in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts (IPCC 2001). Adapting to the changes has consequently emerged as a solution to address the impacts of Climate Change that are already evident in some regions. It involves adjustments to reduce the vulnerability of communities, regions, or activities to climatic change and variability. The IPCC Fourth Assessment Report states that "adaptation will be necessary to address impacts resulting from the warming which is already unavoidable due to past emissions" (IPCC 2007: p. 18). Adaptation to climate change is considered especially relevant for developing countries where societies are already struggling to meet the challenges posed by existing climate variability (Yamin *et al.* 2005; Adger *et al.* 2003; Handmer 2003), and are therefore expected to be the most adversely affected by climate change (McCarthy *et al.* 2001). With all these backdrops, community-based forestry and livelihoods in the context of climate change adaptation project was designed and implemented in four Asian countries- Bangladesh, Nepal, Thailand, and Vietnam. The research aimed to investigate how climate change is affecting forest-dependent communities in one of the world's most vulnerable regions and the actual and potential adaptation measures that enable communities and networks to remain resilient. The project was executed for two year from 2011-2013. During the first year, all the partner countries executed different research activities and conducted site based exploration to understand the community based climate change adaptation with relation to livelihood. While during the second year of the project, the research findings was shared and discussed through workshop seminar held in Kathmandu on December 9-10, 2012.

Presentations

Day one of the seminar was dedicated towards paper presentations on climate change adaptation. A total of eight papers were presented which dealt with community based adaptation to climate change. Primarily, all presentation centered on the issue of climate change impact and community based adaptation in different temporal and spatial context. Detail content of the presentations are discussed below (also refer annex C for presentation slides)

Presentation 1 - Climate Change and Adaptation: Evidences from Forest Dependent Community of Bangladesh

Prof. Dr Md. Giashuddin Miah from Bangabandhu Sheikh Mujibur Rahman Agricultural University, Bangladesh shared on the climate change adaptation evidences in Tangail District of Bangladesh. The paper tries to understand and document the trend of climate change as well as the adaptation measures to cope up with the adverse situations that might arise in the near future. He shared that increasing trend of climate change along with anthropogenic activities are the major factors for declining natural resources and livelihood options of the community. An increasing trend of both maximum and minimum temperatures over time was noted where the increment rate per year of maximum and minimum temperatures was 0.017 and 0.011°C, respectively. The paper further analyzes long term climatic data base, particularly the changing trend of temperature and rainfall have strongly been supported by perceptions/opinions of the community people. The community people have taken several adaptation measures like changing plantation time, using new technologies as well as actively participating in the social forestry programme of the government. In the face of challenges of climate change and livelihoods, community have strongly suggested a number of adaptation measures like construction of water reservoirs, afforestation through community approach, development of pest and disease resistant variety, supply of high quality planting materials among others for conservation of resources and their better livelihoods which need strong support from the public and private levels.

Presentation 2: Understanding Community Based Climate Change Adaptation through Local Perspective

Mr Rajesh Bista, from ForestAction shared about the impacts of climate change and adaptation measures adopted by the Forest User Groups in Nepal. His study sites cover 8 CFUGs of Lamatar Village Development Committees (VDCs) of Lalitpur District. Moreover, his paper assessed the role and responsibilities performed by the local institutions in relation to climate change adaptation and livelihood support. The results show that the dependency on forest product is declining due to the availability of alternative sources and changing preferences on different environmental services. Likewise, community also perceived that there has been a change in climatic parameters like rainfall and temperature in the past few years. The paper measures the performance of different local institutions and recommends the need of institutional preparedness in order to mainstream climate change adaptation and increase the resilience of local community to the changing climate.

Presentation 3 - Adaptability in Agriculture and Forestry Activities in Huong Son Commune of Nam District, Vietnam.

Dr Tran Nam Thang from Consultative and Research Center on Natural Resource Management (CORENARM), presented on the climate change adaptability of local people in Huong Son commune, Nam Dong District, Thua Thien Hue Province of Vietnam. Major arguments in his paper were 1) Climate change have negative impact to the human lives and agriculture and forestry production; 2) Local people have clearly observed climate change fluctuations but they have not got effective adaptation measurements; 3) Primary and unconnected measurements in climate change adaptation are present within the community; 4) The degradation of natural resources threaten livelihoods of those with low income depending on forest and shifting cultivation; 5) Local people, especially the low income groups, have highest vulnerability towards unfavorable climatic conditions; 6) Diversification of livelihood options help local people better adapt to climate change impacts; 7) There haven't been any programmes/projects supporting local people to better adapt to climate change; and 8) There should be policies/projects to help local people in adapting with climate changes.

Presentation 4 - Community-based Adaptation to Climate Change: the Case of Thailand

Dr Birendra Karna from the Asian Institute of Technology, Thailand / ForestAction Nepal, shared on the experiences of community initiatives with regards to climate change adaptation in agriculture and biodiversity in Nakhn Ratchesima Province of Thailand. Like other developing countries, the issue of climatic variability and extremes has been given little attention with a more reactive approach rather than a proactive one, compared to more pressing development concerns such as economic growth, poverty alleviation and environmental degradation in Thailand. He shared that current responses to extreme climatic events are viewed more as disaster preparedness and mitigation opportunities rather than as warning signals of much needed long-term adaptation and the institutional preparedness. He further stressed on the need to focus on bottom-up approach to address the level of vulnerability to the existing and future impacts that could lead to effective enhancement of local adaptive capacity and adaptation in the long run.

Presentation 5 – Climate Change and Livelihoods: Nepalese Perspectives

Mr Khem Raj Dhahal from the Institute of Agriculture and Animal Science (IAAS), Rampur, Nepal shared on the overall climate change discourses with relation to agriculture and livelihoods. The presentation focused on the impact of climate change in agriculture where he showcased various examples to illustrate his arguments. He shared different adaptation practices based on his field experiences and his engagement in different research works in the past. He concluded that agriculture sector should be more prioritized and suitable implementation plan of action to niche specific adaptation plan to climate change is imperative.

Presentation 6 - Community Level Climate Adaptation Planning in Nepal: Insights from Terai and Hill

Mr Rahul Karki from ForestAction Nepal shared on the community based adaptation plan initiatives in Nepal. He stressed that various agencies have been involved in preparing the community adaptation plans (CAPs) aiming to help the local communities cope to the changing environment. Attempt has been made to involve diverse institutions (in the form of unit of CAP preparation) like community forest user groups (CFUGs), the poor, vulnerable

and socially excluded groups and conservation CFUGs (mainly in the case of conservation areas). He argued that with all these achievements in the local climate adaptation process, there are drawbacks both at the policy as well as the implementation level. First, though there are progressive policies at the central level, none of them have considered the CAPs in their framework. The national adaptation framework has only considered the Local Adaptation Plan of Action (LAPA) as the adaptation framework at the local level with CAPs nowhere in the scene. Second, the Ministry of Science, Technology and Environment (MoSTE), responsible for undertaking all climate change related activities in the country do not have their implementing bodies at the meso and local level. With lack of the institutional framework at the meso level, the MoSTE has to rely on other ministries with their district chapters for implementation. Third, with the most vulnerable and poor sections of the community as the central focus of CAPs, there might be chances of their concerns overlooked by the government agencies due to weak influence at the local governance level. Fourth, CAPs in most of the cases have solely considered disaster risk reduction as the adaptation strategy and have overlooked the issues of governance, local and policy advocacy among others. And he finally concluded that there are ample avenues of effective implementation of the CAPs in Nepal. The translation of the national adaptation framework to integrate CAPs, mainstream the CAPs with the local development planning process of Nepal and strong collaboration between the local government bodies and agencies preparing CAPs needed to have its ownership are some of the pertinent issues that needs to be addressed in order to ensure the proper implementation of those CAPs.

Issues raised and discussion

The presentations were followed by discussion which focused on the issues of climate change impacts and adaptation strategies in different sectors like forest, agriculture, water with social, institutional and ecological dimensions in the background. The key issues discussed are summarized below:

i) Strengthen networking and disseminating knowledge

At the end of the presentations, most of the participants stressed on the need to strengthen network between the institutions working in climate change. Even though the impacts of climate change differs in places, cross country sharing and cross boundary learning is

imperative. The mechanism to value add in climate change knowledge should be developed in order to obtain sufficient information and build on the existing one.

ii) Knowledge inadequacy on climate science

In South and South-east Asia, most of the research has been focused on social dimension. However, the scientific and technical aspects of climate change are lacking in most of the research components, mainly in developing countries. Most of the papers were based on social dimensions and very emphasis was put on the technical aspects. Thus, in order to make the research findings more robust, technical components should be inbuilt in climate change research. The paper presented from Bangladesh has very well analyzed the climatic data, and there were some concern over the need for analyzing climate change data in order to triangulate the impacts of climate change collected from social research.

iii) Scope of strengthening climate change adaptation

Agenda on climate change adaptation is in a juvenile stage and the institutions are still evolving. At the national and international level, the governments have been formulating policies on climate change adaptation. Thus from the initial phase of policy formulation, the mechanism and process should be clearly defined and guided by those plans and policy. More focus on national policies overlooking the local practices and adaptation techniques may not be appropriate. Therefore, it is imperative to link the local practices with national policy making process.

iv) Promotion of community based adaptation

In many instances, adaptation strategies have emphasized the needs of the grassroots communities. The promotion of community based adaptation has been envisioned to support and address the agenda of climate change adaptation. The local communities have been practicing climate adaptation activities that best suit the local context. However, these practices have been overlooked in the national policies and frameworks. The culture and tradition of the local communities define the adaptation mechanism, thus context specific adaptation mechanism should be acknowledged and documented.

v) Engagement of wider stakeholder in climate change policy:

The engagement of wider stakeholders is imperative to ensure the success of climate change adaptation activities. In case of Nepal, different communities have been preparing community based adaptation plan of action, but there is lack coordination between agencies working in this sector. Institutions for mainstreaming local level adaptation should be timely considered, but equally important are the coordination and cooperation between the institutions that exist. The vertical integration of institution with close coordination and cooperation among them is crucial to promote synergy. Moreover, the engagement of the stakeholders should not be symbolic and rather proactive involvement of the stakeholders from the beginning will ensure a better coordination and commitment over the activities implemented.

Final remarks

At the end of day one, Dr Naya Sharma Paudel summarized the overall discussion and formally concluded the presentation session. He expressed his gratitude towards all the presenters and participants of the programme and formally closed the session.

Field Visit

The second day, 10 December 2012, of the seminar was dedicated to field visit to Sano Gaun Community Forest of Kavre district. Sano Gaun is the first community forest in the country. The field visit was primarily aimed to understand the forest management practices by the communities in Nepal and targeted to the international participants of the seminar. During the field visit, discussion between participants and forest user group was organized. Participants shared about the history of forest management and its evolution, the management modalities and governance system of the community. Moreover, international practices on sustainable forest management and contribution of forestry in the livelihoods of the local communities were shared to the user groups. Following the discussion, a short transect walk in the forest area was conducted by the participants along with the local user groups.

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Annexes

Annex A: Programme Schedule

Time	Agenda
Date: Sunday, December 09, 2012	
08:30-09:30	Arrival and Breakfast /Registration
09:45-10:15	Welcome by Dr. Naya Sharma Paudel
10:15-10:30	Objective of the Seminar by Dr. Dharma R. Uprety
10:15-10:30	Introduction of the Participants
10:30-11:00	Paper presentation by Prof. Md. Giashuddin Miah Bangladesh
11:00-11:30	Paper presentation by Mr. Rajesh Bista, Nepal
11:30-12:00	Tea
12:00-12:30	Paper presentation by Dr. Birendra Karna, Thailand
12:30-01:00	Paper presentation by Dr. Tran Nam Thang, Vietnam
01:00-02:00	Lunch
02:00-02:30	Paper presentation by Mr. Khem Raj Dahal
02:30-03:00	Paper presentation by Mr. Rahul Karki
03:00-03:30	Closing of the Workshop
03:30-04:00	Tea break
04:00-04:30	APN stakeholders meeting (Project action plan and implementation modality)
Date: Monday, December 10, 2012	
08:30 onwards	Field visit to Pandey Gaun Community Forest, Kavreplanchowk

Annex B: List of Participants

S. N	Name of Participant	Organization	Contact No.	Email	Address
1.	Ram Asheshwar Mandal	REDD CELL, Ministry of Forest and Soil Conservation	9841450564	ram.mandal@gmail.com	Babarmahal
2.	Md. Giashuddin Hial	POSHRAU Gotipur Barsladish	+8801816779614	giase1960@gmail.com	Gotipur
3.	Dipendra pandey	College of Development Studies	9849041650	pd.dipen@gmail.com	Kalanki
4.	Him Lal Shrestha	Kathmandu University	9841302139	hlshrestha@gmail.com	Mhepi
5.	Sangam Gurung	College of Development Studies	9849048823	gurungsangam49@gmail.com	Kritipur
6.	Jiban M. Poudel	College of Development Studies	9841302522	jm_poudel@yahoo.co	Kritipur
7.	Neelam Pokheral	College of Development Studies	9841025210	neelam@cds.edu.np	Baneshwor
8.	Durga Pd. Dahal	College of Development Studies	9851097036	dev2dahal@gmail.com	Baneshwor
9.	Naya Sharma Paudel	ForestAction	9851015386	naya@forestaction.org	Lalitpur

10	Khem Raj Dahal	Institute of Agriculture and Animal Science	9855056490	d.khemraj@ymail.com	Rampur, Chitwan
11	Tvan Nam Thang	CORENARUN		trannamthang@gmail.com	Vietnam
12	Rahul Karki	Forestaction	9851139176	rahul@forestaction.org	Kathmandu
13	Rajesh Bista	ForestAction/Purvanchal University	9851139450	rajesh@forestaction.org	Kathmandu
14	Birendra K. Karna	ForestAction/Asian Institute of Technology	9841365923	birendra@forestaction.org	Kathmandu
15	Dhara Raj	Multi-stakeholder Forestry Program	9849049149	dharma.uprety@gmail.com	Kathmandu
16	Ngamindra Dahal	Independent Researcher	9841342629	ngamindra@gmail.com	Kathmandu
17	Manita Chaudhary	ForestAction	9841050219	manita@forestaction.org	Lalitpur
18	Lalit Thapa	ForestAction	9843241444	lalit@forestaction.org	Lalitpur
19	Amrit Adhikari	ForestAction	9841254906	amrit@forestaction.org	Lalitpur
20	Jailab Kumar Rai	Tribhuvan University	9841407486	jailab@forestaction.org	Lalitpur

Annex C: Presentation Slides

Presentation 1: Community-based Forestry and Livelihoods in the context of Climate Change, By: Dharam R Uprety

Community-based Forestry and Livelihoods in the Context of Climate Change Adaptation



Dharam Raj Uprety, Ph.D.
Proponent of this project

Objective of the project

- Establish an international-level climate change network among researchers in Asia, particularly Nepal, Bangladesh, Thailand and Vietnam.
- Document, analyse, synthesise and publicise empirical lessons on community based adaptation strategies to national and regional policy makers.
- Organize policy seminars and disseminate research findings through diverse publications and engage with policy makers at national and international level.

Time line of the project

Detailed Timeline:


- Month 1 Selection of research team members, and research students, orientation and planning meeting, develop guidelines and norms, identification of research sites;
- Month 2 Desk review, research design, prepare checklist and questionnaire development;
- Month 3 Planning meeting of country research teams, Preliminary visits to selected sites, consultations with stakeholders both at national and sub-national level and collection of secondary information, and gap analysis of each country
- Month 4 Develop country specific research method and tools; sharing these method and tools to each collaborator, organise first sharing workshop about research theme inviting concerned stakeholders from both government and non-government sector possibly in each country.
- Month 5 Conduct key-informants interview with diverse range of stakeholders at different level, and documentation of these responses.
- Months 6-7 Inception workshop at site level inviting target community in the discussion, interaction with local stakeholders, site specific research; interviewing with local communities, site specific observation
- Months 8-9 Data coding, data refining, develop code book, and data entry into related computer software (e.g. SPSS) and collection of missing data (if any); Country specific analysis of data, exchange code book, prepare and exchange country case studies draft and research manuscripts to the collaborator.
- Months 10-11 National level sharing workshops aimed at policy makers, managers and decision makers; and , editing case studies, reflection sharing, writing discussion note, thesis or dissertation writing, feedback to students;
- Months 12-14 Brainstorming workshop among researchers, focal person of APN, SPG member of APN, and experts in the CC adaptation involved in the project, plan of drafting a special issues of climate change adaptation covering research outputs from collaborating countries, planning and drafting of policy briefs in each countries, discussion on research findings with Government and Non-governmental stakeholders in the Asia-Pacific region.
- 15-17 organise international policy workshop in one of the project countries, writing of special issues of Journal of Forest and Livelihoods on CC adaptation
- 18-20 Writing policy briefs in each country, engage in policy debate with government and non-governmental organisations, editing of journal (special issue) continue
- 21-24 Publications of policy briefs, journal, writing research article, meeting of researchers

Thank you for your hard work

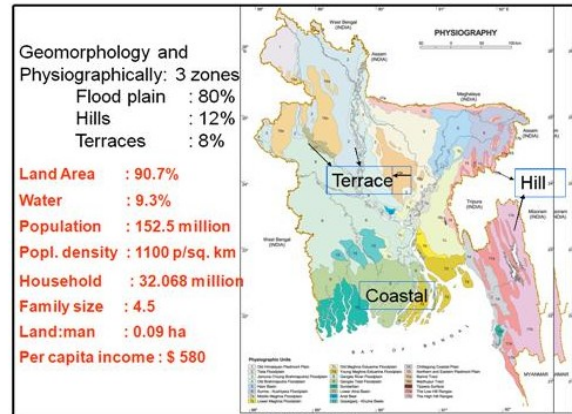


Presentation 2: Climate Change and Adaptation: Evidences from a Forest Dependent Community of Bangladesh

Climate Change and Adaptation: Evidences from a Forest Dependent Community of Bangladesh



Prof. Dr. Md. Giashuddin Miah
 Dept. of Agroforestry and Environment
 Bangabandhu Sheikh Mujibur Rahman
 Agricultural University
 E-mail: giash1960@gmail.com



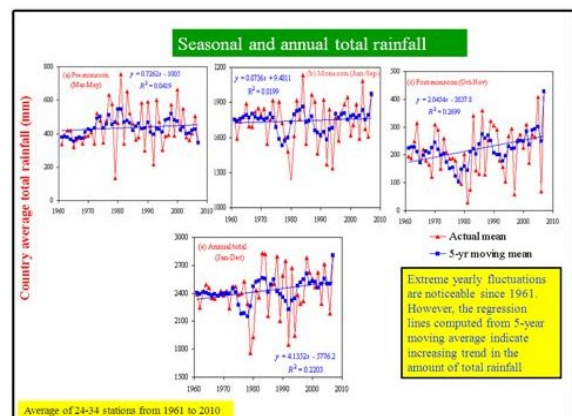
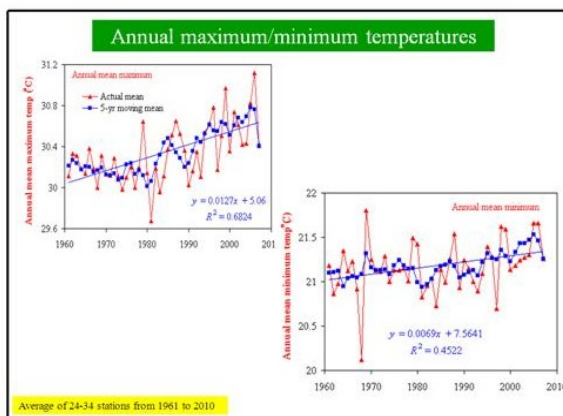
Climate of Bangladesh: Humid Subtropical

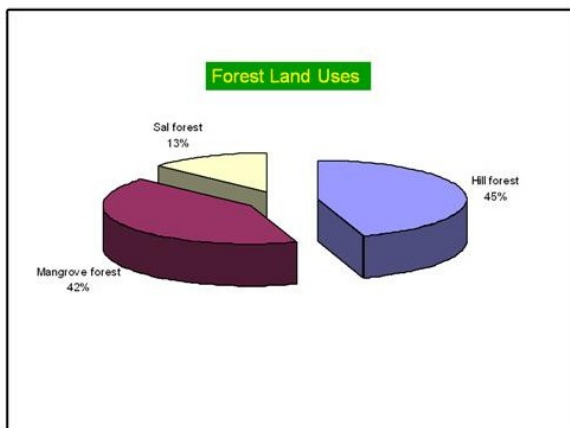
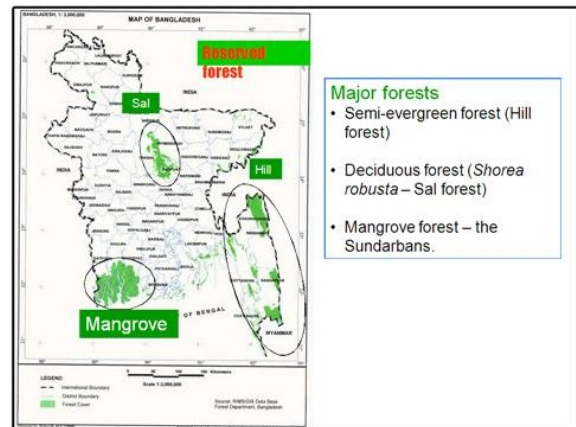
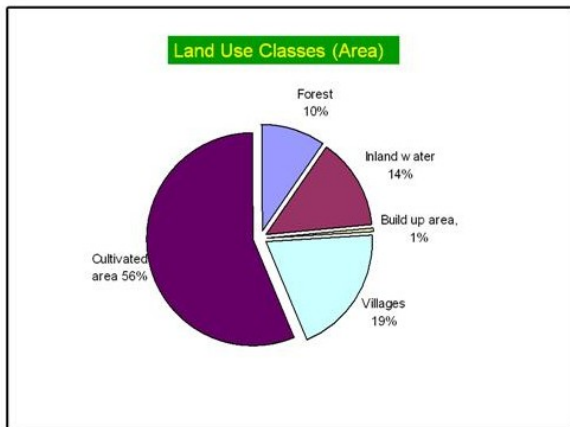
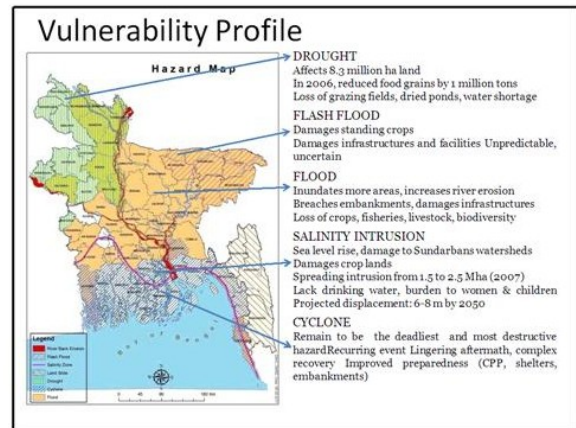
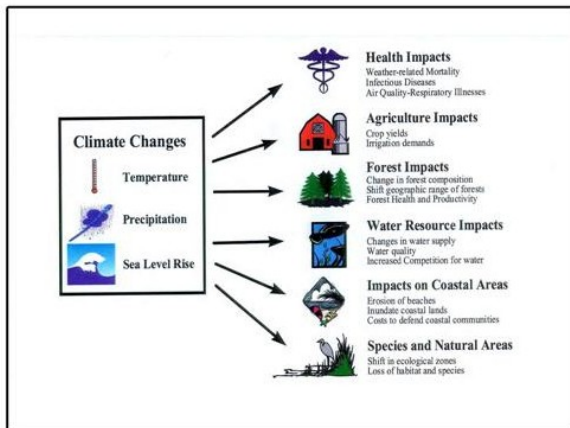
Major season:

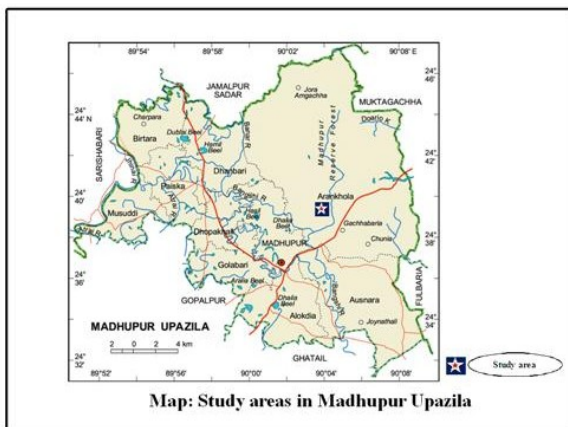
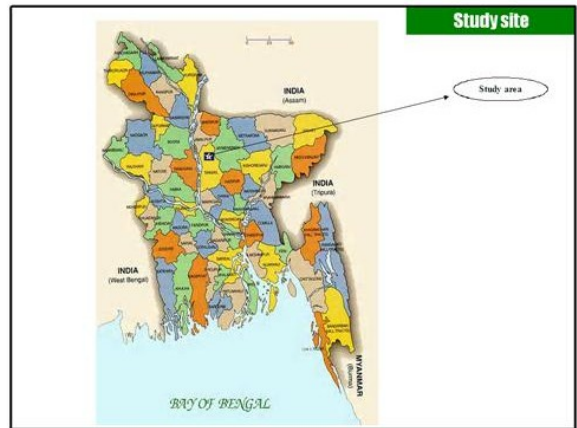
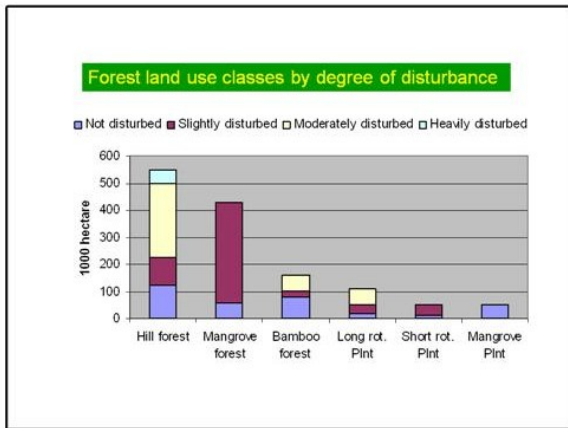
- Summer - March to October
 - Pre-monsoon: March to May
 - Monsoon: June to October
 - Post-monsoon: October to November
- Winter: November to February

IPPC prediction on changes in sea level, temperature and precipitation

Year	Sea level rise (cm)	Temperature rise (°C)	% change in precipitation (base 1990)
2030	30	+ 0.8 in Monsoon + 1.1 in Winter	- 1.2 in Winter + 4.7 in Monsoon
2050	50	+ 1.1 in Monsoon + 1.6 in Winter	- 1.7 in Winter + 11.8 in Monsoon
2100	100	+ 1 in Monsoon + 2.7 in Winter	- 3 in Winter + 11.8 in Monsoon

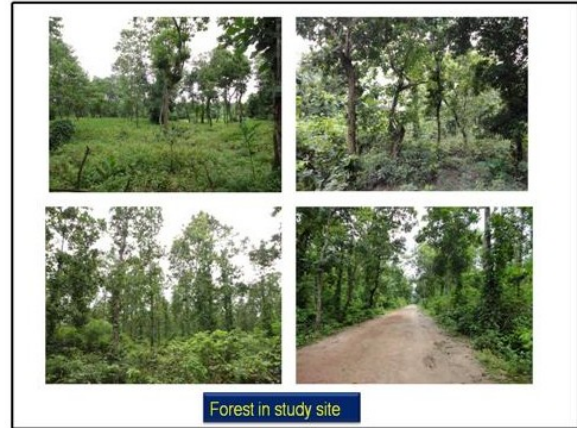






METHODOLOGY

- Observation of study area and discussion with relevant officials
- Site selection for the case study
- Population and sampling technique
- Data collecting tools
- Data collection procedure
- Program development for analyzing data
- Data processing and analysis





MAJOR FINDINGS

Table 1. Socio-economic and demographic profile of the respondents

Character with unit	Category	Respondents' Opinion			
		Frequency	Percent	Mean	Standard Deviation
Age (Actual year)	Young aged (up to 35)	11	22	46.76	0.76
	Middle aged (35-50)	19	38		
	Old (>50)	20	40		
Education (Year of schooling)	Illiterate (No schooling)	13	26	-	1.71
	Primary (1-5)	28	56		
	Secondary (6-10)	7	14		
	Higher (>10)	2	4		
Family size (Number)	Small family (<5)	17	34	5.86	2.18
	Medium family (5-8)	27	54		
	Large family (>8)	6	12		
Farm size (ha)	Landless (<0.02 ha)	3	6	0.56	0.22
	Marginal (0.02-0.2 ha)	4	8		
	Small (0.2-1.0 ha)	23	46		
	Medium (1.0-3.0 ha)	15	30		
	Large (>3.0 ha)	5	10		

Table 2. Monthly income of the respondents in the study area

Income level (BDT Tk)	Income group	Respondents' opinion (%)
≤1,999	Extreme poor	10.75
2,000-4,999	Poor	79.10
5,000-7,999	Medium	5.65
≥8,000	Rich	4.50

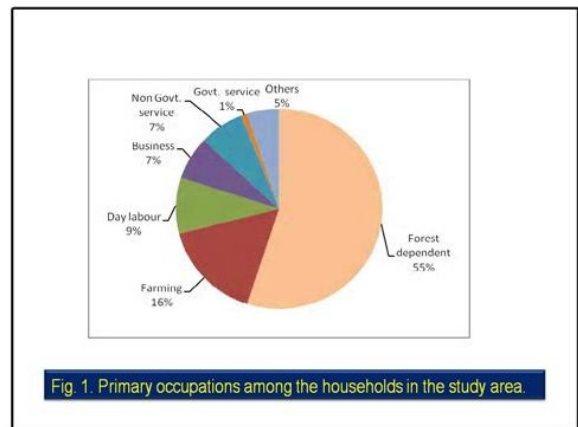


Table 3. Changes in distribution of tree species in the study area

Type of change forest species	Vegetation	Respondents' opinion	
		Frequency	Percent
Decrease of indigenous spp.	Sal (<i>Shorea robusta</i>)	50	100
	Bohera (<i>Terminalia bellerica</i>)	50	100
	Hortoki (<i>Terminalia chebula</i>)	50	100
	Amloki (<i>Embllica officinalis</i>)	50	100
Increase of exogenous spp.	Akashmoni (<i>Acacia auriculiformis</i>)	38	76
	Eucalyptus (<i>Eucalyptus camaldulensis</i>)	25	50
	Mahogany (<i>Svietenia macrophylla</i>)	20	40
	Other species	10	20

Table 4. Types of forest products available/collected as opined by the respondents

Forest product	Availability of forest products as opined by respondent (%)		
	10 years back	Current year	Change (%)
Leaf and branch	100	84	-16.00
Fuel wood	100	74	-26.00
Timber	80	46	-42.50
NTFP (Non-Timber Forest Product)	50	20	-60.00
Bamboo	32	14	-56.25
Fodder	20	10	-50.00
Fruit	25	10	-58.33

Table 5. Alternative resources against less availability of forest products in the study area

Alternative resource	Respondents' opinion	
	Frequency	Percent
Cow dung stick	35	70
Rice husk and bamboo	26	52
Plant part/material of homestead plantation	20	40
Crop stubble	7	14
Kerosene	4	8
Stove/ bio-gas	2	4

Table 6. Change of crop coverages over time in the study area

Crop	Change of crop coverages (respondent (%) grows crops over time)		
	10 years Back	Current year	Change
Turmeric	23	63	+ 40
Banana	15	45	+ 30
Aroid	12	37	+ 25
Pineapple	10	32	+ 22
Ginger	6	24	+ 18
Potato	0	14	+ 14
Rice	12	22	+ 10
Wheat	6	0	- 6

Table 7. Water availability and its source in the study area

Water source	Respondents' opinion	
	Frequency	Percent
Availability of water over time		
Increase	-	-
Decrease	50	100
Purpose: Domestic		
Roar pump	50	100c
Purpose: Irrigation		
Shallow tube well	22	44
Water from others machine	6	12
Total	50	100

Climate variability over time

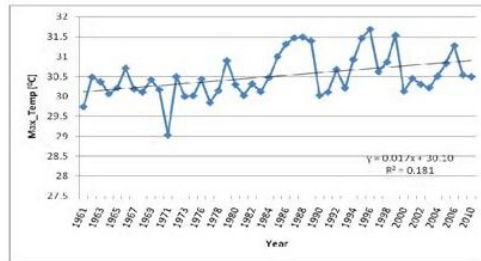


Fig. 2. Long-term (1961-2010) trend of maximum temperature in the study area.

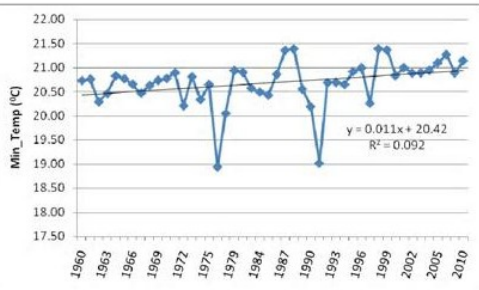


Fig. 3. Long-term (1961-2010) trend of minimum temperature in the study area.

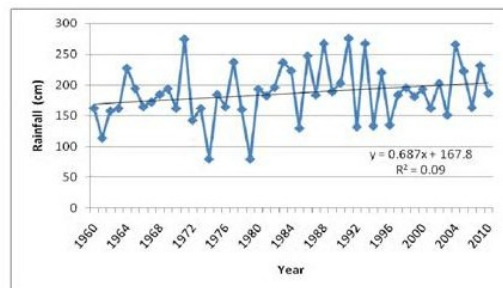


Fig 4. Long-term (1961-2010) trend of rainfall in the study area.

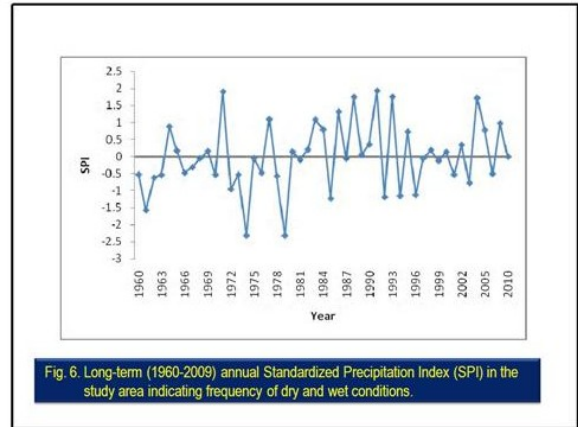
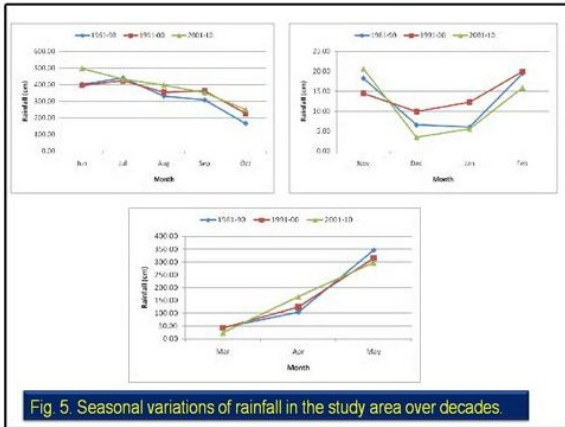


Table 8. Respondents' perception on climate change over time in the study area

Climatic parameter	Respondents' perception (respondent opinion expressed as percent)				
	Increased	Decreased	No change	No idea	Total
Temperature (Summer season)	98	0	0	2	100
Temperature (Winter season)	34	44	14	8	100
Rainfall intensity	64	24	2	10	100
Rainfall frequency	18	72	2	8	100
Drought length and severity	54	8	14	24	100
Drought frequency	56	4	16	24	100
Hailstorm amount and severity	0	28	18	54	100
Frost/ dew intensity and severity	14	26	26	34	100
Cold spell-intensity and severity (March-April)	24	10	24	42	100
Cold spell-intensity and severity (September-October)	14	16	22	48	100
Cloudy weather	44	26	12	18	100

Table 9. Adaptation measures in relation to forest management in the study area

Adaptation measure	Respondents' opinion (%)
New plantation with participatory approach	80
Restriction on harvesting of forest products (Restricted by the Department of Forestry)	54
Promote social forestry activity	42
Making small water reservoir inside the forestland	32
Control of grazing (Restricted by the Department of Forestry)	24
Distribution of improved seed of grass or fodder tree	22
Introduction of new fuel use technology (i.e. Improved stove, biogas)	20
Control of pest and disease	16

Table 10. Type of adaptation measures in relation of agricultural/crop production in the study area

Adaptation measure	Respondents' opinion (%)	
Changing planting date/time	100.00	
Using new technologies	Variety	12.87
	Micro-irrigation	19.25
	Plant protection measure	11.95
	Variety, micro irrigation & plant protection measure	55.93
	Total	100.00

Table 11. Major problems faced by the community to maintain their livelihood in the study area

Major problem	Respondents' opinion	
	Percent	Rank
Decrease of ground water level	90	1
Cutting of trees illegally	86	2
Decrease of grazing land	76	3
Restriction by the Government in harvesting of forest products	70	4
Infestation of disease and insect-pest both in forest and agricultural crop	66	5
Sudden extreme climatic events like storm, excess rainfall, water logging, high temperature, cold spell, frost etc.	62	6
Decrease of land productivity	60	7
Lack of quality planting material/seed	52	8
Degradation of soil/land	40	9
Long dryness and drought	38	10
Change of timing of weather parameters	28	11

Table 12. Opportunities to solve the problems as suggested by the community for their better livelihood in the study area

Opportunity suggested by the respondent	Respondents' opinion	
	Percent	Rank
Construction of water reservoirs (small pond, ditches, dam) to preserve water	88	1
Afforestation through community approach/partnership	80	2
Development of pest and disease resistant variety	78	3
Provision of grass land for grazing livestock	64	4
Availability of high quality planting material/seed	56	5
Reduction of use of chemical-fertilizer and pesticide	50	6
Increase homestead plantation with diverse species	46	7
Provide access of resource collection from forest area	44	8
Improvement of drainage system to reduce flooding/water logging condition	30	9
Provide loan or credit to overcome the crisis period	26	10

CONCLUSION

- Socio-economic status of local community was poor resource base and once they were heavily dependent on the forest ecosystem for their livelihoods.
- Currently the trend of dependency on forest and forest products along with other resources (crops, water etc.) has been drastically reduced.
- Increasing trend of climate change particularly temperature and rainfall along with anthropogenic activities are the reasons for decreasing the natural resources particularly forest.
- Among the anthropogenic activities, illegal harvesting and over-exploitation of the forest and forest products are the main driving forces.

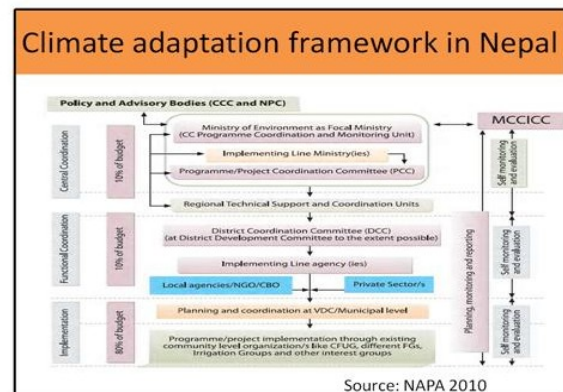
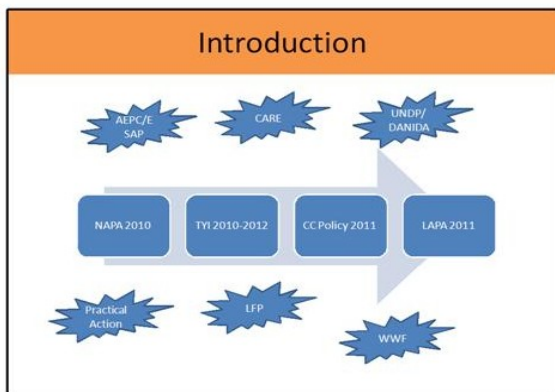
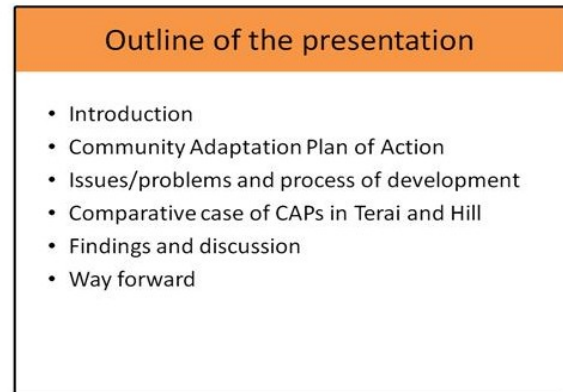
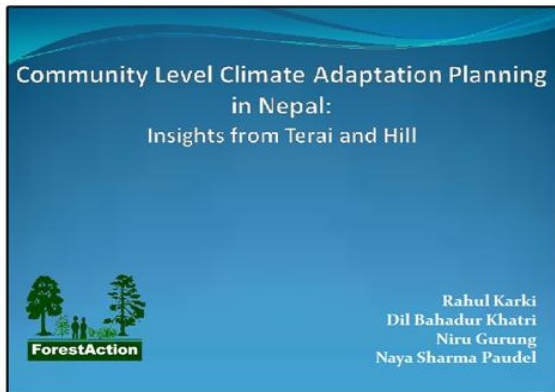
CONCLUSION

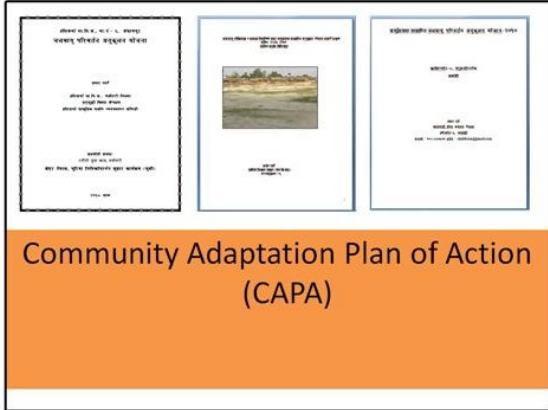
- For conserving of forest resources and maintaining friendly environment, the government has restricted the access of the people to the forestland for harvesting any forest products and promoted social forestry activity.
- Community people have well accepted the social forestry program and they are also co-operating for its well execution.
- Community people have taken some adaptation measures like changing planting time, using new technologies etc.
- However, community strongly opined that the concerned authorities should take appropriate measures like construction of water reservoirs, afforestation through community approach/partnership, development of pest and disease resistant variety etc. for sustaining and improving their livelihoods.



Thank you

Presentation 3: Community Level Climate Adaptation Planning in Nepal: Insights from Terai and Hill

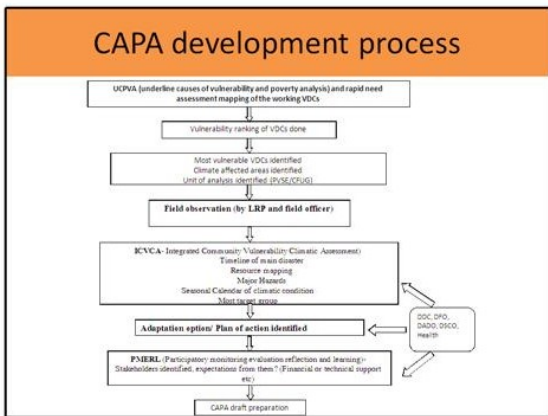




Community Adaptation Plan of Action (CAPA)

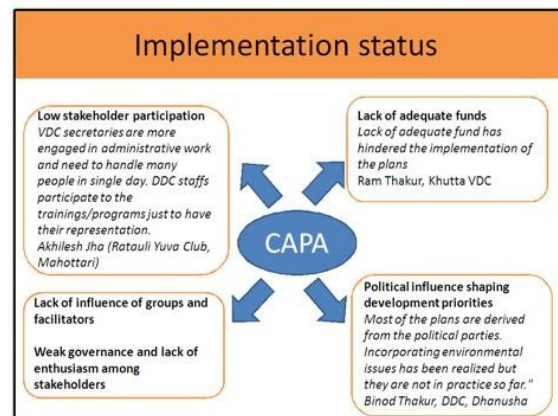
General description

	Teral	Hill
Unit of CAP preparation	Poor, Vulnerable and Socially Excluded (PVSE) groups	Community Forest User Groups (CFUGs)
Number of CAPs prepared	35	12
Implementation status	Not yet implemented	Not yet implemented
Key priority projects	<ul style="list-style-type: none"> Natural disasters (Drought, landslide, flood, water resource drying) Disease (human, agriculture and livestock) Resistance to wind Fire 	<ul style="list-style-type: none"> Natural disaster (Drought, landslide, flood, water resource drying) Disease (human, agricultural and livestock) Extinction of indigenous plants and increase in invasive plants
Institution and Funding	<ul style="list-style-type: none"> No clear costs identified Institutions identified (fund sharing not clear) VDC level fund 	<ul style="list-style-type: none"> Cost identified Institutions identified (fund sharing clear) CFUG level fund
Linkage	VDC planning	DPs of CFUG



Resources

	A case of Hariyo Ban
Key activities	To adapt with drought and climatic change
Planned budget	Tentative Total budget: 620000 External source: 348000 Community source: 272000
Expected source/support	Hariyo Ban, DSCO, VDC, district water division, irrigation, DADO
Actual investment	Not started yet



Institutional choice

	Terai (PVSE)	Hills (CFUG)
Nature of the project	More focused on livelihood of poor and vulnerable	More focused on biodiversity, climate change and REDD+
Vulnerability	Vulnerable in terms of disaster	Vulnerable in terms of disaster
Geographical location	Less forest area; dominance of poor groups	Presence of CFUGs

Integration and Coordination

Vertical Integration

- CAPA not reflected in local development plans
- Lack of local representative of line agencies (e.g. MoE)
- Poor implementation status of CAPAs
- Lack of mandates to line agencies
- Increasing political influence in development priorities



Horizontal Coordination

- Climate adaptation least prioritized among government line agencies
- Risk of fund sharing among institutions
- Poor implementation status of CAPAs
- Differentiated responsibilities and lack of coordination



Development Vs adaptation plan

- Too development focus of local government
- "The roles and responsibilities of VDCs are clear however, issues of climate change are not clear so far."* **Laxmeshwor Thakur**, VDC Secretary, Basbitti VDC
- No mandate for supporting adaptation activities
 - Climate change friendly development?

Issues/problems pertaining to CAPAs

- CAPAs not recognized in the adaptation framework (NAPA/LAPA)
- No ownership from the DDCs/VDCs/line government agencies
- Uncertainty over ownership by target groups
- Obscure sustainable financing
- Confusion over geographical scale and institution

Way forward

- Mainstream climate change agenda in DDC/VDC level planning
- Secure additional funds for adaptation from local government channel
- Integration of CAPAs with the national framework (NAPA/LAPA)
- Better coordination among target communities, local government and line agencies
- Increased ownership of CAPAs among concerned stakeholders

Acknowledgement

CARE Nepal
Partner organizations and local communities
The Asia Pacific Network

Presentation 4: Community-based Adaptation to Climate Change: The Case of Thailand

Community-based adaptation to climate change: the case of Thailand

By
Birendra Karna
Wipawa Chuenchit
Asian Institute of Technology, Thailand

Introduction

- In Thailand, like many other developing countries, the issue of climate extremes has been given little attention
- Current responses to extreme climatic events are viewed more as disaster preparedness and mitigation opportunities rather than as much needed long-term adaptation
- While current scientific knowledge on an increasing climate change impacts do not provide conclusive assessments of the associated impacts at local levels

Introduction...

- Therefore a need for a bottom-up approach to address the level of vulnerability to the existing and future impacts that could lead to effective enhancement of local adaptive capacity and adaptation in the long run.

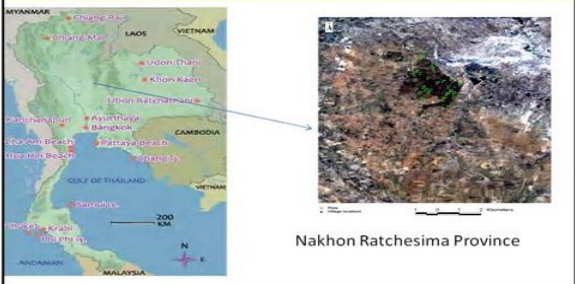
National Initiatives:

- Thailand has been a party of UNFCCC since March 1995

Introduction..

- Submitted Initial National Communications to UNFCCC in 2000
- Preparing for the Second National Communication
- National Strategy on Climate Change – 2008-2012

Study Site



Nakhon Ratchasima Province

Sites description

- *Kog Bung Preu* Community Forest (KBP-CF)
- 3 villages (Moo) Ban-Lung, Non-Boad, Ban-Trai-Tong of Sra -Chorakhea Tambon of Dan-Khun-Tod District in Nakhon Ratchesima Province
- 379 HH with 1713 population
- Annual average income is 15000 baht (1 US\$: 40 baht)
- Land holding average 17 rai (1 rai = 1600 sq m)

Sites description..

Institutions

- Kog-Bung-Preu Community forest headed by a **President** - a post that is held by the present Chief of the Tambon (i.e., the Khamnan)
- The forest committee receives support from the Provincial Forestry Office
- Tambon Administrative Office (TAO) at district level

Data Collection

- Household survey (50 HH)
- Group discussion



Climate change and Adaptation

As a tropical country, Thailand is highly Vulnerable to climate change:

- Agriculture
- Forest Biodiversity
- Coastal
- Health

Impact on Agriculture



- Change in amount and pattern of rainfalls leading to drought, flooding
- Change of moisture level in soil
- Emergence of and increase in pests and crop diseases

Impact on Agriculture

- Reduction of crop yields
- Introduce local drought-resistant varieties of paddy rice
- Adopt potential crop substitution like Cassava



Impact on Agriculture



- Change in precipitation create long-term effects on surface water supply, ground water supply and fresh water ecological systems.
- Drought, especially in dry seasons, will intensify and may lead to severe conflicts in water resource allocation.

Impact on Forest Biodiversity



- collecting mushrooms, ants, ant eggs, vegetables, frogs/ lizards, wild fruits and bamboo shoots for household use and commercial purpose
- Encourage reforestation with drought and heat tolerant species, gene bank, plant culture

Discussion

- Capacity building at Tamboon level is urgently needed
- Need of institutions prepared for any climate related issues
- Support community-based water resource management
- Encourage water conservation and crop diversification in agriculture

Discussion

- Sufficient need of international support to conduct research on the issues
- Need immediate attention-regionally and globally
- Thailand need to understand that domestic actions are of priority

Thank You

Presentation 5: Understanding Community-based Climate Change Adaptation through Local Perspective

Character	Category	Respondents Opinion (%)
Sex	Male	73
	Female	27
Age	Below 35	23
	35-50	43
	Above 50	34
Education/year of schooling)	Illiterate	3
	Primary (1-5)	20
	Secondary(6-10)	27
	Higher (>10)	50
Occupation	Agriculture dependent	30
	Forest Dependent	13
	Private Services	20
	Government Services	10
	Business	7
	Day Labor	20
Farm Size (Ropani)	0-2 ropani	20
	2-6 Ropani	43
	6-12 Ropani	23
	Above 12	14

Climatic Parameter	Respondent perception (in percent)			
	Increased	Decreased	No Change	No idea
Temperature(Summer)	93	7	0	0
Temperature(winter)	17	76	3	4
Rainfall Intensity	33	57	10	0
Rainfall frequency	10	77	13	0
Landslide/flood severity	20	23	50	7
Landslide/flood frequency	27	23	40	10
Drought length and severity	87	3	7	3
Drought frequency	83	7	10	0
Hailstorm amount and severity	10	63	17	10
Frost amount and severity	10	73	13	4
Cloudy weather	60	20	13	7

Agriculture	-Decrease in Agriculture production esp- Rice, Wheat, Mustard -Increasing incidence of pest and disease in agricultural crops -Early ripen of vegetables												
Water	-82% of the respondent opined the decreasing water quality and quantity												
Forest	-Increasing invasive spp(Lantana Camera) and forest fire incidence -Early flowering of tree spp- Rhododendron, Prunus, Pears, Bay-bery , Myrica Esculanta -Change in Distribution of vegetation												
	<table border="1"> <thead> <tr> <th>Increasing</th> <th>Decreasing</th> </tr> </thead> <tbody> <tr> <td>-Castanopsis Indica</td> <td>-Myrsine Capitellata</td> </tr> <tr> <td>-Myrica Esculanta</td> <td>-Myrsine semiserrata</td> </tr> <tr> <td>-Quercus Glauca</td> <td>-Winter Green</td> </tr> <tr> <td>-Alnus</td> <td>-Gofla</td> </tr> <tr> <td>-Betula Alnoids</td> <td></td> </tr> </tbody> </table>	Increasing	Decreasing	-Castanopsis Indica	-Myrsine Capitellata	-Myrica Esculanta	-Myrsine semiserrata	-Quercus Glauca	-Winter Green	-Alnus	-Gofla	-Betula Alnoids	
Increasing	Decreasing												
-Castanopsis Indica	-Myrsine Capitellata												
-Myrica Esculanta	-Myrsine semiserrata												
-Quercus Glauca	-Winter Green												
-Alnus	-Gofla												
-Betula Alnoids													

Community Based Adaptation measure

Case 1: Community initiation of Bio-Briquette Production

- Bio briquette production from 2010 from the invasive species worth Nrs 20,000.
- In 2011 charcoal supply for TU
- Good market and higher demand –
- Help to maintain healthy forest

Case 2: Tomato farming for Income diversification

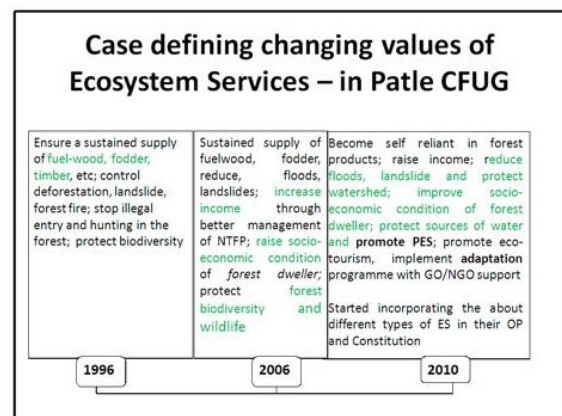
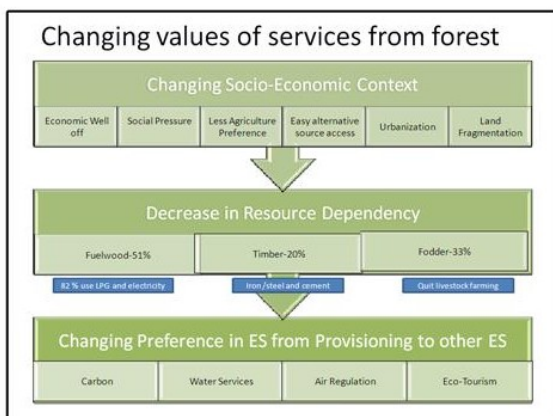
- Water resource decline, decline in ag product
- More than 585 tunnel with the size of 5*12 m
- Drop irrigation techniques and less consumption of water.
- High rate of return; three times of investment. (average expenditure per plot =50,000)

Case 3: NTFP promotional activity in lamatar

- Two NTFP demo plot nursery with the aim to preserve and identify
- More than 138 types of NTFP in one demo plan and another demo plot managed by Patley CF has more than 60 NTFP, which was supported by DFO and DDC lalitour.

Case 4: Community Adopting PES mechanism

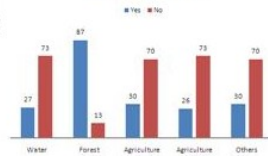
- Tri party agreement on Commercial water supply(CF, Bainsdodevi Drinking water company and land owner)
- NRs 100 /tank to CF with 10% annual increase
- Income Vary from NRS 6000-22000/month (base on water demand which range from 60-125 tank per month)



Local Institution Overview

Institution	Number	Vertical Layer
Water Based	10	DWRC
Forest Based	11	DFO
Agriculture Based	20	DADO
Livestock Based	5	DLDO
VD Program Group	19	DDC
Cooperatives	15	

Figure 1: Frequency(%) showing the access on different local institution



Participation and Performance

Figure 1: Perception (%) on Performance of Local Institution

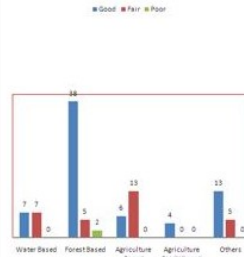


Figure 2: Level of Participation on Local Institution

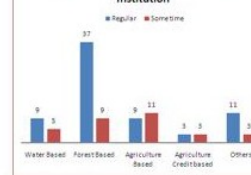
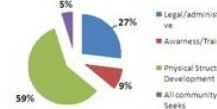


Figure 3: Service provided by VDC



Factors Promoting Better Institutional Performance for Adaptation and their ranking

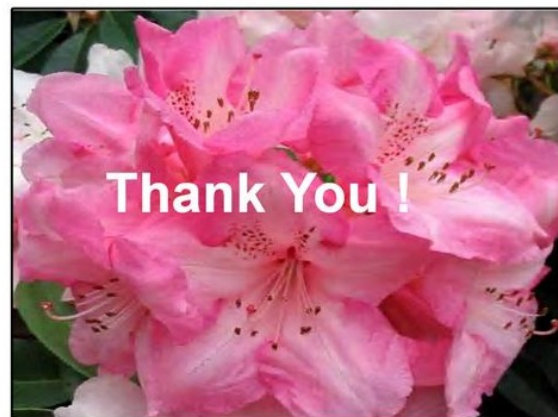
Factors	(Agrawal 2010, Ostrom 1990, Ribot 2002)				
	VDC	Forest Based	Agriculture base	Water Based	Others
Characteristics					
Organizational rule and understandability	@	@		@	
Local involvement/participation	@	@	@	@	@
Fairness in resource allocation	@	@		@	
Clear Mechanism for enforcing rule	@	@		@	
Accountability of Decision makers	@	@	@	@	
Context of Institution					
Dissemination of new technology and training		@	@	@	
Facilitating the functioning of local institution by Central gov	@	@			
Network and their links with other social groups	@	@		@	
Group Served					
Defined Boundaries of group	@	@		@	
History of successful shared experience; existence of social capital	@	@			
Appropriate leadership that change periodically (democratic)	@	@			
Interdependence among group members		@		@	@
Information Availability about the ecological system	@	@			

Lessons Learnt

- Learning on CBA comes from practices rather than theory. Thus, need to draw lesson based on ground practice of adaptation.
- Community Forest user Group could be of the institutional choice for mainstreaming climate change adaptation in local level.
- LAPA envisioned VDC as a "operational unit for local level adaptation, but there needs to be more reformation in terms of their capacity, coordination, resources, priorities.
- In every catastrophic event community respond on their own way, from which lesson can be drawn for CBA.
- Chaining socio-economic context of community people change the values of Ecosystem services which also support to draw lessons for developing community based adaptation plan.

Acknowledgement

- APN
- Communities of Lamatar Cluster
- Dr. Dharam Raj Uprety, Shanti Shrestha
- Rajaram Paudel, Yasodha Bista



Plastic Shade House for Vegetable farming



Questionnaire Survey in study site



NTFP Demo Plot Info



FGD



Participant of CC adaptation training



Presentation 6: Adaptability in Agriculture and Forestry Activities in Huong Son Commune, Nam Dong District, Thua Thien Hue, Vietnam

**ADAPTABILITY IN AGRICULTURE AND FORESTRY
ACTIVITIES IN HUONG SON COMMUNE, NAM
DONG DISTRICT, THUA THIEN HUE, VIETNAM**


Tran Nam Thang
Consultative and Research Center on Natural
Resource Management (CORENARM)

Introduction

- Climate extreme (typhoon, flood) increase both in temporal and spatial scale.
- Huong Son is a Katu community with 86.5% local people are farmers.
- Variations in climate change adaptation..

**Study area: Huong Son
commune
Nam Dong district,
Thua Thien Hue province**

- 100% Katu ethnic group
- Average forest dependency:
18% in 2004, 8% in 2009.
- Community forest allocated
since 2004
- High fluctuation in rain and
temperature conditions
between wet and dry seasons



Objective

- To investigate the status of adaptability of local people in agriculture and forestry production in Huong Son commune, Nam Dong district, Thua Thien Hue province.
- To see climate change adaptation strategies in the mountainous area.
- To find the way for policies making for local context, creating incentives for local people to develop forestry and agriculture economics with sustainable manners.

Study content

- Climate change and its impact on forestry & agriculture production.
- Climate change vulnerability of local people.
- Local personnel and experience in coping with climate change.
- Adaptive production practices.
- Adaptive measurement based on the available resources.
- Factors affecting climate change adaptive capability.

Methodology

- **Secondary data:**
 - The social economic data from related documents of district, commune offices
- **Primary data:**
 - 60 households in the commune were randomly chosen for interview.
 - Groups discussion afterward for data validation and crosscheck
- **Data analysis:**
 - Descriptive analysis.
 - Multiregression analysis.

Results

1. Impact of climate change on agriculture and forestry production:

- High fluctuation of rainfall
- Change in the dry season time (prolonged)

⇒ Changes in the seasonal calendar of local people, high density of pest and diseases.

In addition:

- No soil erosion measurement and fertilizer application.
- Great conversion of natural forest to other land use (774 ha from 2003 – 2010)

⇒ flooding, soil erosion and low yield production.

Results

2. Climate change vulnerability:

Table 1: Perception of local people about the trend of natural disaster

Trend of natural disaster	Percentage		
	Increase	Reduce	Stable
Flood	51	8	41
Typhoon	89	5	5
Drought	95	3	3
Cold period	70	30	0
Hot period	97	0	3

Results

2. Climate change vulnerability:

Table 2: Perception of local people about extreme weather conditions

Extreme weather conditions	Percentage		
	Earlier	Later	Stable
Time of appearing cold period	8	92	0
Time of appearing flood period	46	22	32
Time of appearing hot period	95	5	0
Time of appearing droughts	89	8	3
Time of appearing typhoons	46	38	16

Results

3. Climate change adaptation measurement:

Table 3: Adaptive measurements in daily production in Huong Son commune

Case	Yes	No
Apply soil conservation measurements	10.8	89.2
Change the seasonal calendar	86.5	13.5
Apply pest and disease removal measurement	59.5	40.5
Apply pest and disease prevention measurement	10.8	89.2

Results

3. Climate change adaptation measurement

Table 5: Adaptive measurements in livestock and animal grazing

Type of grazing	Percentage	
	Measure	Percentage
Type of grazing	Caged	7.7
	Free ranging	3.8
	Both	88.5
Change in Castle grazing	Increase	92.3
	Reduce	0
	Stop grazing	7.7
Change in small animal grazing	Increase	0
	Reduce	70.6
	Stop grazing	29.4
Change in husbandary	Increase	9.1
	Reduce	36.4
	Stop grazing	54.5

Results

3. Climate change adaptation measurement

Table 6: Reason for changes in livestock grazing

	Percentage		
	Increase	Reduce	Stable
Disease	100.0	.0	.0
Folder availability	4.8	90.5	4.8
Quality of foraging area	5.0	95.0	.0
Impact of temperature change	20.0	13.3	66.7

Results

4. Livelihood strategies:

Table 7: Income from forest and household economic in Huong Son commune

		Household economic status			
		Wealthy	Medium	Poor	Very poor
Contribution of plantation forest	Very important	42.9	57.1	.0	.0
	Important	31.8	59.1	9.1	.0
	Not important	.0	.0	.0	.0
Contribution of NTFPs products	Very important	.0	.0	.0	.0
	Important	25.0	62.5	12.5	.0
	Not important	25.0	50.0	25.0	.0

Results

4. Livelihood strategies:

Table 8: Participation of household in different livelihood options

Income source	Percentage	
	Yes	No
Paddy field	73.0	27.0
Plantation forest	78.4	21.6
Livestock grazing	54.1	45.9
Husbandry gazing	43.2	56.8
Fishery and aquaculture	2.7	97.3
Swidden cultivation	83.8	26.2
Rubber plantation	64.9	35.1
NTFP harvesting	32.4	67.6
Small business	2.7	97.3
Labour for rent	24.4	74.6

Results

4. Factors affecting adaptability of local people:

Adaptability of local people depended on:

- The economical condition of the household (The better off household has higher adaptability compared with the poor ones);
- The role of natural forest with household livelihoods (higher the role, lower the adaptability of local people)

=> The poor household group suffer most from the impact of climate change.

Discussion

- Climate change is becoming more and more prominent in the area.
- Local people changed: seasonal calendar, number of livestock and husbandry, cultivation techniques, crop composition, pest and disease prevention measurement and apply new techniques into their daily production activities.
- Most of the adaptation activities of local people toward climate changes are from their own experience or they learnt from each other. There have no national program in the area.
- Local people are getting more and more concerned to learn about measurements to reduce risks and impacts of climate change

Discussion

- Natural resources are important for local livelihood. However, they are degraded.
- Community forests were put at the lowest priority in climate change adaptation strategies (low vulnerability) compared to other options.
- In addition, poor allocated forests create low incentives.
- Economic condition and dependency on forest resource decide the adaptive capability of local people.
- Factors that help increase adaptability: Economic conditions, assets and infrastructure development, health and labour force, diversity in the livelihood options and education of local people, accessibility of local people to the mass media or educational programmes

Thank you

Presentation 7: Climate Change and Livelihood: Nepalese Perspective

What next? Adaptation!

- IPCC defines adaptation as adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderate harm or exploits beneficial opportunities (IPCC, 2001).
- There are many management practices in agriculture that can restore wastelands, soils and ecosystems to enhance soil organic carbon and improve soil quality and health and, at the same time, help climate change mitigation and adaptation to it.

Contd...

- In the face of global climate change, farmers must choose their practices to adapt to the changing temperatures and more frequent extreme weather events.
- This adaptation must first and foremost build resilience within the agro ecosystem, increase its ability to continue functioning even when faced with unexpected events (Borron, 2006).

Contd..

- Such practices include agroforestry, organic agriculture, conservation tillage, mulching, cover crops, poly-farming, bio-intensive farming, biodiversity conservation, etc. the basic notion of which is managing the ecosystem better.
- Ecosystem and biodiversity management play a vital role in both ecosystem-based mitigation (carbon sequestration and storage) ecosystem based adaptation (e.g. societal adaptation to climate change impacts) in sustaining agriculture and livelihood.

Contd...

- In managing agro-ecosystem agroforestry offers a great opportunity to the farmers in terms of soil, animal, human and environment health and there by enhancing the adaptive capacity of community to changing climate.
- Similarly, organic agriculture, based on ecological processes to increase soil fertility and manage the whole production system, provides a broad set of practices that increase adaptive capacity and resilience in farms.

Farmers' practice to adapt

- Communities have been using traditional methods of adaptations for generations based on local knowledge and innovations. Shifting to the alternatives where ever possible
 - Try to predict the timing of Monsoon and adjust their crop planting
 - Introduction of mixed farming to avert the risk of failure
 - Replacement of local crop varieties with more drought or pest tolerant varieties

Contd...

- Changing entire cropping system- commonly replacing the rice crop with finger millet, black gram, fruit crops or fodder and forage crops and improved animal husbandry
- Collection and utilization of cattle urine for use as a plant tonic and the base material for bio-pesticide production
- (SSMP,2011)

Contd..

- Based on the finding in Banke, Bardia, Dhading and Rasua)
 - Early warning system, Seasonal and off season vegetable cultivation (Bardia), establishing water pumps, forest management,
 - Cultivation of potato and maize one month earlier than before, planting of entire potato instead of cut tuber, focus on vegetable farming, rearing of poultry and goat as these require less water,
 - construct gabion walls to protect fro land slide, and planting of stylo and Alnus in landslide sites,

Contd..

- community managed water tank to store water, roof management against storms, etc.
- Installation of solar panel, water way drainage at the head of land slide areas.
- Use of pipes for water management, temporary well to collect water for irrigation, with less water requiring crops like millet, lentil mustard and tomato,

Contd..

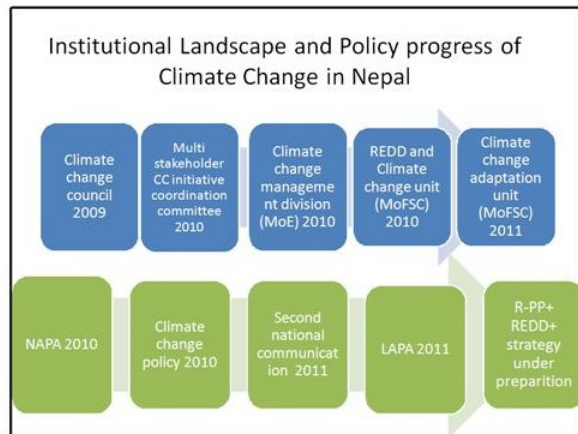
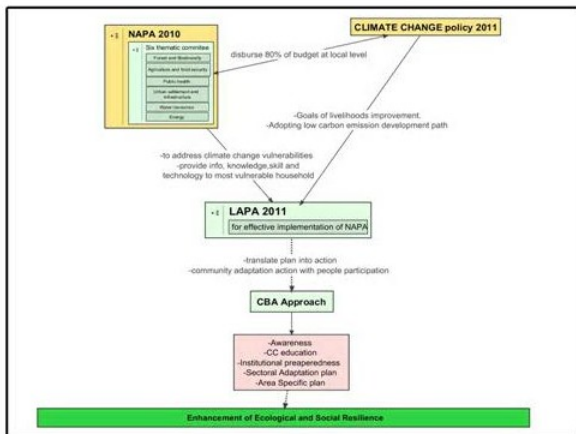
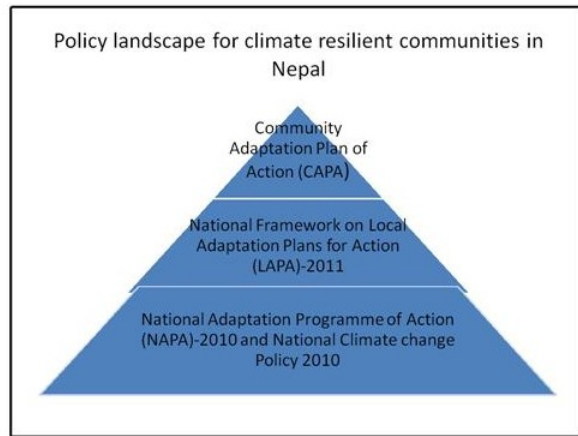
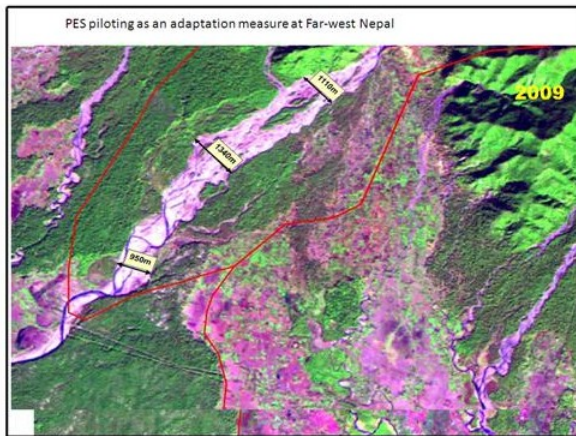
- NGO
 - Water harvesting, storage tank, organic farming, seed production, plantation programs, provision of drinking water, income generation activities, improved cooking stoves, etc
- Government
 - NAPA, LAPA and CAPA
 - Development of drought resistant varieties such as Sukha 1, 2 and 3.
 - Trying to develop flood tolerant rice
 - DSCO supporting with wire mesh protection and construction of embankments near the river bank erosion sites.

Conclusions and suggestions

- There is a need to investigate whether or not existing local knowledge and livelihood assets, government and NGOs efforts are sufficient enough to enable the farmers to cope with the present and future climate change.
- Agriculture is not getting proper attention in national adaptation platform
- There is a serious need for suitable and implementable plan of action to niche specific adaptation plan to climate change

THANK YOU !!!
for
YOUR
ATTENTION

Presentation 8: Building Climate Resilient Communities through Community-based Adaptation Planning and Action: Some Empirical Evidences from Nepal



- Local communities and community based adaptation
- 17685 Community forest users Group (CFUGs)- 1,652,654 ha of forest land
 - 195 Collaborative forest management groups- 45678.44 ha forest land
 - 6712 Leasehold Forest management groups-38917.58 ha forest land
 - 973 Public land/ wasteland management group- 7697 ha of non-forest land
 - Buffer zone user groups are 4,088 and managing 5076 sq km of forests land involving 700,000 population



Deep boring pump construction as an adaptive measure at Kailali district

- Construction of Water pump
- Community forestry (Up and down): plantation of grass, and other NTFPs to control soil erosion
- Fire line construction
- Reduce grazing

Adaptation practices	Why	Since
Harvesting Rainwater in Plastic Pond	To fulfill the need of water for home garden during the time of water scarcity	1993
Community Seed Bank	To promote conservation and use of local genetic resources, access to seeds among poor farmer during crop failure and seed shortage thus reducing vulnerability to crop loss	1993
Participatory Plant Breeding	Reintroducing local varieties and land races of rice, motivated as a result of gradual decrease in yield and disease and pest outbreaks in modern varieties	
Shift to NTFP Farming	Utilization of bare sloppy land, high productivity and commercial value compared to traditional farming of Millet and Maize	1990
Rupa Lake Conservation and Fishery Development Cooperative	Improving local livelihood and enhancing forest and biodiversity conservation	2002
Crop and Livestock Insurance	Minimizing the risk of crop failure and livestock death due to weather-induced hazards or disease outbreaks	2011

Adaptation Practice	Why	Since
Forest Management (Grafting, 3 tire)	To increase the economic and ecological balance of forest	2007
Watershed management around the pond	To sustain the irrigation for farming during the period of water scarcity	2002
Bagar Farming (Peanut) In River Cutting Area	Livelihood improvement through utilization of sandy loam soil near river eroded area for peanut's growth and development	2002
Zatropa farming	To promote biodiesel as low carbon alternative to fossil fuel	2008
Construction of bed on the field	To control water logging and improving agricultural productivity	2005





Conclusion

- High-sound policy processes are under preparation/formulation at policy level, but still their linkage with community adaptation planning and their sustainable implementation is questionable.
- A need of adaptation is felt at local level to cope with different types of problems resulted from climate change, but mainstream of development yet materialize the adaptation into the development interventions
- Most of the adaptation measure are initiated by projects, except few examples of self initiated local practices based on local knowledge



Annex D: Event Photos



Photo 1: Dr Naya Sharma Paudel (first from the left) facilitating the session



Photo 2: Participants of the Seminar



Photo 3: Presentation by Prof Miah



Photo 4: Participants during the discussion with the user groups at Sano Gaun Community Forest