

Tropical Forest and Climate Change Adaptation (TroFCCA)

PHILIPPINES

Final Project Report

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BACKGROUND

TroFCCA is a four-year project of the Center for International Forestry Research (CIFOR) and the Tropical Agriculture Center for Research and Higher Education (CATIE). The main objective is to contribute to national processes of adaptation to climate change, in particular, and create efforts to mainstream adaptation into development policies.

The specific objectives of the project are as follows:

- Identify regional development issues related to climate change impacts over forest that can increase the vulnerability of the society;
- Develop specific methodologies to assess vulnerability;
- Contribute to current national and regional adaptation processes;
- Develop criteria and indicators for adaptive forest management;
- Develop policy-oriented adaptation strategies; and
- Facilitate a science-policy dialogue on adaptation.

The project operates in three regions: Central America, Southeast Asia and West Africa. All regions share the same project's general framework but each will develop their own methods on the basis of their respective regional contexts and prioritized needs. In the Philippines, water resources and landslides are the chosen priority topics.

TroFCCA in the Philippines is the continuation of the project entitled: An Integrated Assessment of Climate Change Impacts, Adaptations, and Vulnerability in Watershed Areas and Communities in Southeast Asia (AIACC) that ended in 2006. For TroFCCA's third year in the Philippines, the main activities consist of the development of methodology for the vulnerability assessment of the water resources, policy and literature studies, development of national policy, and dissemination of information materials. The assessment of vulnerability methods is developed mainly through literature studies and participation in international, regional, and national workshops and seminars.

The Philippines is highly dependent on water resources for domestic and industrial use, irrigation, power generation, animal husbandry, fisheries and recreation activities. The country is becoming more prone and susceptible to water related disasters under weather extremes such as floods, droughts, and typhoons.

Since susceptibility to water related disasters will likely increase with climate change, TroFCCA in the Philippines focuses on water resources as the priority research area. TroFCCA in the Philippines is the continuation of the project entitled: An integrated assessment of climate change impacts, adaptations, and vulnerability in watershed areas and communities in Southeast Asia (AIACC) which ended in 2006.

YEAR 1

MAIN ACTIVITIES

For the first year of TroFCCA in the Philippines, we focused on phase 1 of the project. Settling up of the TroFCCA office in IRRI, Los Baños, Laguna, Collection of Data and Modelling Tools, Review of Literature and Paper writing were done. A consultation workshop was organized to have a better picture of the climate change adaptation strategies available in some areas of the country. In search of appropriate methodologies for TroFCCA, the researcher attended a 5-day workshop or regional climate modeling organized by the Hadley Center and MMD in Petaling Jaya. Hopefully the climate scenarios that will come out of this training will be very useful to TroFCCA.

1. Mainstreaming Survey

The TroFCCA-Philippines team conducted survey on whether or not climate change has been mainstreamed or not in the country. This survey was sent to all AIACC participants who attended the workshop, people in the academe, local and national government, international organizations, and concerned individuals. The survey will give us some baseline information on the perceptions of these people of climate change and what is being done about it in the Philippines.

2. Seminars/Workshop Conducted

Consultation Workshop

A Consultation workshop was held last June 29, 2006. This was done as a culmination of the AIACC project for a policy consultation with the Pantabangan Watershed respondents and people from the national government. Due to the minimal funding available for the workshop, it was decided that the workshop will be co-funded with the AIACC project that was wrapping up the results of their project in the Pantabangan watershed.

Policy Workshop in Balay Alumni, Diliman, QC. Philippines.

Aside from the monetary savings, TroFCCA benefited from the workshop in that the output of the project was used as baseline information for the TroFCCA project. The 1 day workshop gave us a better perspective of the status of climate change in the country. This workshop was a good venue to: first, introduce TroFCCA to the people working with climate change in the country; and second, to identify some of the gaps, some useful baseline information in the climate change status in the country. The following outputs are some of the results agreed on during the open forum of the said workshop.

Results of the Policy Workshop on Linking AIACC Results to the 2nd National Communication

Group 1 : AIACC Members			
	Description/Action	Responsible Person/Agency	Time Frame
1. Results	All results of the project will be incorporated (or reported) in the Second National Communications	IACCC in coordination with ENFOR	Two years starting this year
2. Methods	All methods used will be reported, but will be subject to certain qualifiers; e.g. time constraints, scope of study and data availability	IACCC in coordination with ENFOR	Two years starting this year
3. Specific steps to ensure incorporation of AIACC results to National Communications	Coordination works AIACC results become input to further works on Vulnerability and Assessment	IACCC in coordination with ENFOR	Two years starting this year

Group 2: Government agencies, NGOs, NGAs			
Entry point	Specific Actions	Responsible Agency/Person	Time Frame
Research and Development	<ul style="list-style-type: none"> Conduct policy analyses Strengthening of database Conduct validation studies <ul style="list-style-type: none"> Results Methodologies <ul style="list-style-type: none"> Adaptation strategies: crop suitability ; cropping calendar; cropping system; S&W conservation measures Valuation studies Additional monitoring/observation In depth study on infrastructure design/specifications to address climate change concerns 	Multi-sectoral (national/local NGAs, NGOs), LGUs, academe DA (BSWM/NIA) PAGASA PAGASA	
Policy/Planning	<ul style="list-style-type: none"> Results of validation studies incorporated in comprehensive land use plan and comprehensive development plan of LGUs Conduct of comprehensive profiling of watersheds and develop watershed management plan Introduce climate change into existing policy platforms Integrate climate change concerns in existing DA-Agrokalikasan program 	LGUs, NGAs, NGOs DENR, FMB	

Development programs	<ul style="list-style-type: none"> • Develop IEC • Training and capacity building of LGUs and different agencies assigned to implement plans and conduct studies • Formation of an e-group for CC 	NGAs DA, NGAs TrofCCA	
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3. Trainings Attended

- Regional Climate Modelling for ASEAN Regions using PRECIS (Providing Regional Climate for Impacts Studies) Training held in Petaling Jaya, Malaysia August 7-11, 2006.
- Communications Skills Training held in IRRI, Los Baños, Laguna September 11-15, 2006
 - topic 1: Writing to be read
 - topic 2: Success Stories for reports and proposals

4. Output

- Paper writing for the Holdridge Classification—1 book chapter was submitted to Neil Leary (Attachment A)
- Another paper on using the Holdridge Classification and GCMs was submitted to the Journal of Forest Research (Attachment B)
- An online website for determining the Holdridge Classification of an area given temperature and precipitation was developed. (Attachment C)
- Another joint paper (joint with the RUPES project) with Grace Villamor, RD Lasco, R.V.Cruz and P. Sanchez was presented by P. Sanchez during the International Seminar Workshop on INTEGRATED WATER RESOURCES MANAGEMENT held at the University of the Philippines Diliman, Q.C. Philippines on Sept. 4-8, 2006.
- The research paper resulting from the presentation was submitted to the Journal of Forest Research for Review and hopefully for publication. This is entitled (Attachment D)
- Currently we are collaborating on a research project assessing the mainstreaming of adapting to climate change in the country. This will hopefully support/aid the policy synthesis paper that will be one of the outputs that will be presented by the end of this year during the policy forum.

YEAR 2

MAIN ACTIVITIES

The activities during the second year consist of the development of methodology for the vulnerability assessment of the prioritized sectors. TroFCCA in the Philippines has been involved in the development of national policy, literature studies and policy dialogs on landslide and water resources, and information dissemination materials. These activities are briefly explained below:

1. Policy Dialog

2. Methodology Development and Testing

The methodology for vulnerability assessment is one of the highlights of the research. The assessment of vulnerability methods is developed mainly through literature studies and participation in international, regional, and national workshops and seminars.

In 2006, a first cut using rough simulation studies have been developed using Global Circulation Model (GCMs) data for Southeast Asia and the Holdridge Lifezones method of classification. The results observed a shift of lifezone classification of the Philippines to drier types of forests. However, there is a need to validate the results on what can really happen in the future.

3. Specific Research Activities

Policy and Literature Studies

Two approaches were used in assessing how far climate change has been integrated into major development plans and programs of the government. Relevant documents were initially reviewed, such as the Philippine Medium Term Plan and the Philippine Agenda 21, to determine whether and in what way climate change has been considered. In addition, sectoral plans and programs in the agricultural and forestry sector were also examined.

Key informant interviews were also conducted among people who are most active in the climate change discussion in the Philippines. This was used as a basis for making the list of attendees in the various national climate change meetings, conferences and workshops, including the project team. Figure 5 shows the profile of the respondents:

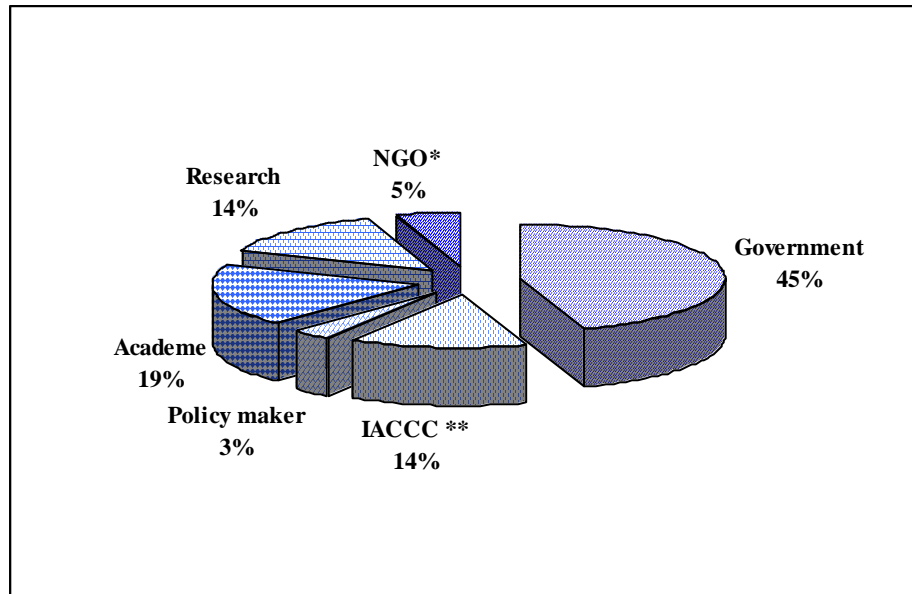


Figure 5. Profile of the respondents to key informant interviews.

A total of 64 respondents were interviewed either by telephone, fax, or actual face-to-face interview. Twenty percent of the respondents were government employees, 5% policy makers, 6% from non-government organizations, 20% AIACCC (An Integrated Assessment of Climate Change Impacts, Adaptation and Vulnerability of Watershed and Communities in Southeast Asia) participants, 18% from the academe, 11% from research organizations and the remaining 20% were concerned individuals. There was a fairly even distribution of respondents from all sectors.

Baseline data on mainstreaming climate change into forest policies were also initially collected showing that people in the national sector recognized the importance of mainstreaming climate change in the country. The goal of the interview was to check for baseline information on some perceptions of the different organizations on whether climate change mainstreaming is important or not. 95.31% of the respondents said “yes” while the remaining said they had “no comment/lacks sufficient information”.

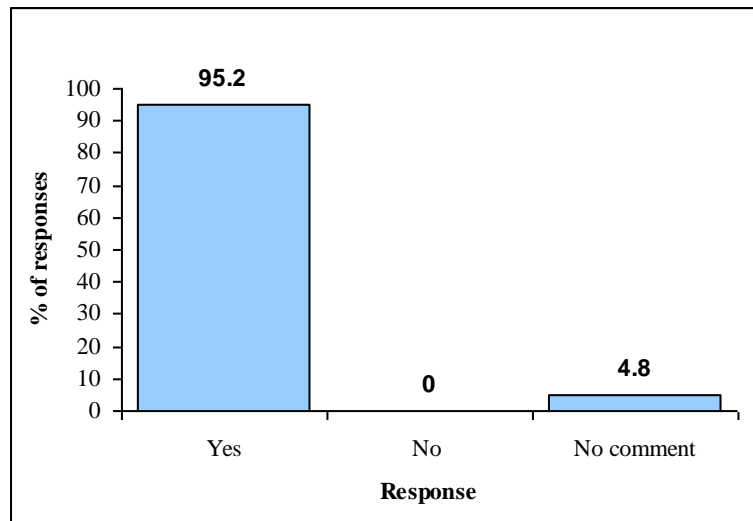


Figure 6. Perceptions on whether or not the respondents think mainstreaming climate change is important or not.

The next question was on whether or not they think climate change has been mainstreamed into Philippine policies or not. Fifty percent of the respondents said “no”, 28.13% said “no comment/lacks sufficient information” while the remaining 21.88% said “yes”.

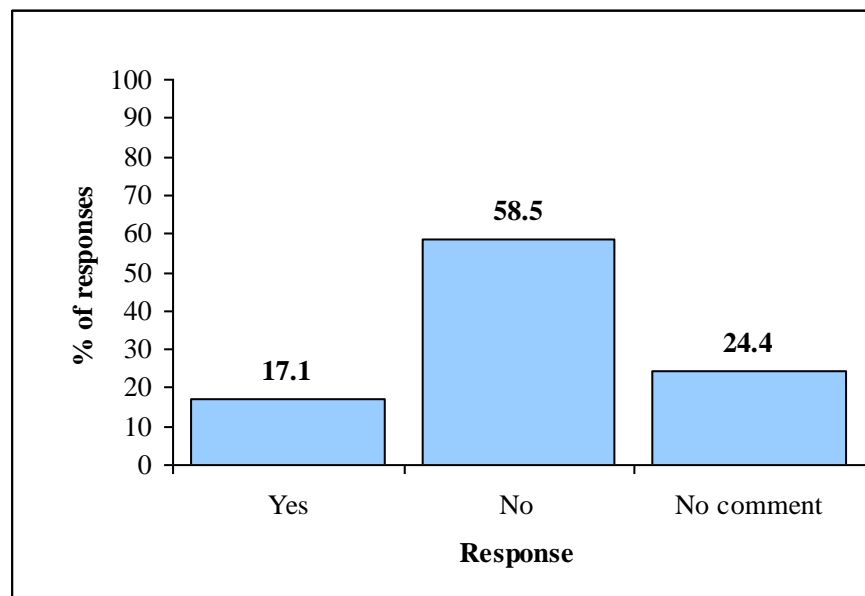


Figure 7. Perceptions on whether or not the respondents think climate change has been mainstreamed into Philippine

policies or not.

It is interesting to note that when asked for reasons why they said “yes”, 1-advocacy of NGOs ranked the highest, 2-awareness, 3-availability of funds and 4-political will. There do exist policies (e.g. water act, clean air act, etc.) that include climate change into the picture “indirectly”, but there is a strong need to repackage this to focus more on the climate change issue.

More methodologies are currently being developed for the succeeding years of the project.

Currently, ICRAF Philippines headed by Dr. Lasco is part of the Technical Working Group of the Senate Committee on Environment and Natural Resources for the refining of the Senate Bill proposing the creation of a National Commission on Climate Change Adaptation. Also, ICRAF is participating on various meetings and workshop on mainstreaming climate change adaptation.

Regional climate simulation using PRECIS

PRECIS Regional Climate Modelling is currently being run in collaboration with the International Rice Research Institute Climate Unit. The goal of this mini-project is to have baseline information on future climate scenarios at a higher resolution to determine our adaptation strategies in the different tropical forest topographies around the country.

Providing Regional Climates for Impact Studies (PRECIS) is based on the Hadley Centre's regional climate modelling system. PRECIS was developed in order to help generate high-resolution climate change information for as many regions of the world as possible. The intention is to make PRECIS freely available to groups of developing countries in order that they may develop climate change scenarios at national centres of excellence, simultaneously building capacity and drawing on local climatological expertise. These scenarios can be used in impact, vulnerability and adaptation studies, and to aid in the preparation of National Communications, as required under Articles 4.1 and 4.8 of the United Nations Framework Convention on Climate Change (UNFCCC). *

4. Publications

Listed below are the materials produced and distributed by ICRAF Philippines for the TroFCCA Project:

Jaranilla-Sanchez PA, Lasco RD, Villamor GB, Gerpacio R, Nilo GP and Villegas KL. 2007. A Primer on Climate Change Adaptation in the Philippines. Laguna, Philippines, World Agroforestry Centre (ICRAF).

Jaranilla-Sanchez PA. TroFCCA – Forests and Climate Change Adaptation in the Philippines. Laguna, Philippines. World Agroforestry Centre - ICRAF. Policy Brief.

Lasco RD, Gerpacio R, Sanchez PAJ, and Delfino RJP. 2008 Philippines Policies in Response to a changing climate: A review of natural resource policies. Policy Brief. Southeast Asia Regional Center for Graduate Study and Research in Agriculture . 8p.

Lasco RD, Delfino RJP and Sanchez PAJ. 2008. Local Government Initiatives to Climate Change Adaptation: A Case Study Of Albay, Philippines. Laguna, Philippines. World Agroforestry Centre - ICRAF. Poster Presentation.

Lasco RD, Delfino RJP and Sanchez PAJ. 2008. Local Government Initiatives to Climate Change Adaptation: A Case Study Of Albay, Philippines. Laguna, Philippines. World Agroforestry Centre - ICRAF. Policy Brief.

5. Conference and Seminars

ICRAF Philippines country coordinator and staff participated in various seminars, workshops and meetings. These activities have the important purposes of introducing TroFCCA and finding and sharing knowledge for the development of methodology for vulnerability assessment. Several important meetings and workshops were attended.

- Policy Workshop on Linking AIACC (Assessments of Impacts and Adaptations to Climate Change), an Integrated Assessment of Climate Change, Results to the 2nd National Communication, organised by University of the Philippines Los Baños, Manila, Philippines, 26 August 2006.
- International Day for Biodiversity Conservation, University of the Philippines, Diliman, Quezon City, Philippines, 23 May 2007.
- Methodology Workshop of the 'Tropical Forests and Climate Change Adaptation' (TroFCCA) Project, 24–27 April 2007, Bogor, Indonesia
- Planning meeting for making a video on climate change in the Philippines, Klima, Ateneo de Manila, Diliman, Quezon City, October 2007.—also making a working paper for this video...
- First National Conference on Climate Change Adaptation (NCCCA), Albay, Philippines, 22-24 October 2007
ICRAF (project proponent) have been involved on some initiatives on mainstreaming climate change adaptation to sustainable development in coordination with the Local Government Unit (LGU) of Albay. ICRAF co-sponsored the first and pioneering National Conference on Climate Change Adaptation (NCCCA) held on October 22-24, 2007 at Legazpi City, Albay with the theme: "Think Global Warming, Act Local Adaptation". The major output of the conference was the Albay Declaration on Climate Change Adaptation (Please see attachments). Also, a Center for Research and Initiatives on Climate Change

Adaptation (CIRCA) - a joint venture of ICRAF, the Provincial Government of Albay, Department of Environment and Natural Resources- Environmental Management Bureau (DENR-EMB) Region 5 – has been established to conduct research, development and extension activities in the province of Albay.

- UNFCCC Conference of Parties (COP) 13 , Bali, Indonesia, 6-14 December 2007
The main goal of this conference was threefold: to launch negotiations on a climate change deal for the post 2012 period, to set the agenda for these negotiations and to reach agreement on when these negotiations will have to be concluded. TroFCCA has sponsored a breakfast, on 9 December 2007, to introduce the project and discuss the current activities of TroFCCA in the South America, Africa and Southeast Asia. Dr. Rodel Lasco and Patricia Ann Sanchez attended this conference.
- International Biodiversity and Climate Change Conference, Manila, Philippines 19-20 February 2008.
The conference provided a setting for discussing opportunities for adapting to and mitigating climate change while conserving biodiversity in Southeast Asia. ICRAF Philippines participated and co-sponsored the conference. A thousand dollars was allotted by TroFCCA for the co-sponsoring of this conference.

6. Local Partners

This section lists the organizations and partners with whom we have established a working relationship. They are classified into three large groups: government organizations dealing with development programs, policies and regulations; research organizations dealing with scientific services and development of science and technology; others including projects or field practitioners and NGOs.

Government Organizations

Bureau of Soil and Water Management (BSWM) The BSWM is committed to continuously search for the best and precise soil and water management practices and technology and their promotion to specific appropriate locations.

Local Government Unit of Albay
Environmental Forestry Programme – University of the Philippine Los Baños

Research Organizations

KLIMA Climate Change Center
International Rice Research Institute (IRR)

YEAR 3

MAIN ACTIVITIES

The main activities for 2008 consist of the development of methodology for the vulnerability assessment of the water resources, policy and literature studies, development of national policy, and dissemination of information materials. The assessment of vulnerability methods is developed mainly through literature studies and participation in international, regional, and national workshops and seminars. These activities are outlined and briefly explained below.

1. Policy and Literature Studies

Lasco et.al. assessed how far climate change has been mainstreamed into national and sectoral policies, plans and programs with focus on the agriculture and natural resources sector. Results of this study and initial assessment were presented in the article submitted to the Climate and Development Journal.

More methodologies are currently being developed for the succeeding phase of the project.

2. Development of national policy and programs

TroFCCA in the Philippines has been actively involved in the process of integrating climate change adaptation into national policy and programs. ToFCCA staff are part of the Technical Working Group of the Philippine Senate Committee on Environment and Natural Resources who is responsible for the refinement of Senate Bill proposing the creation of a National Commission and framework program for climate change adaptation. The activities include the participation of the TroFCCA Philippines staff on several meetings and dialogues. Also, TroFCCA Philippines staff contributed in the drafting of Medium Term Philippine development plan (MTPDP) commissioned by NEDA, and are part of the team preparing the Philippines' Second National Communication.

3. Publications

Lasco RD, Gerpacio R, Sanchez PAJ, and Delfino RJP. 2008 Philippines Policies in Response to a Changing Climate: A Review of Natural Resource Policies. Policy Brief. Southeast Asia Regional Center for Graduate Study and Research in Agriculture. 8p.

Lasco RD, Delfino RJP and Sanchez PAJ. 2008. Local Government Initiatives to Climate Change Adaptation: A Case Study of Albay, Philippines. Laguna, Philippines. World Agroforestry Centre - ICRAF. Poster Presentation.

Lasco RD, Delfino RJP and Sanchez PAJ. 2008. Local Government Initiatives to Climate Change Adaptation: A Case Study of Albay, Philippines. Laguna, Philippines. World Agroforestry Centre - ICRAF. Policy Brief.

Lasco RD, Pulhin F, Jaranilla-Sanchez PA, Garcia K and Gerpacio R. 2008. Mainstreaming Climate Change in the Philippines. World Agroforestry Centre - ICRAF. Working Paper No 62:23 pp.

Lasco RD, Delfino RJP, Sanchez PAJ and Rangasa M. 2008. Mainstreaming Climate Change Adaptation in Forest and Natural Resources Management in the Philippines: the role of local governments. Presented at the International Conference on Adaptation of Forests and Forest Management to Changing Climate, Umeå-Sweden, August 25-28, 2008

Lasco RD, Delfino RJP, Pulhin FB, and Rangasa M. 2008. The Role of Local Government Units in Mainstreaming Climate Change Adaptation in the Philippines. AdaptNet Policy Forum 08-09-P-Ad, 30 September 2008.

Lasco RD and Delfino RJP. 2008. Air Pollution, Climate Change and Tropical Forest: Exploring the Linkages. Presented at the Sub-workshop 4: Impacts of AQ and CC on Food Production, Biodiversity and Forestry, Better Air Quality (BAQ) Workshop, Bangkok, Thailand, 12-14 November 2008.

Lasco RD, Delfino RJP and Pulhin FB. 2008. Climate change adaptation and natural resources management – seeing two sides of the same coin: the Albay, Philippines experience. Poster Presentation.

4. Conferences and Seminars

TroFCCA Philippines staff participated in various seminars, workshops and meetings. These activities provided venues to introduce the TroFCCA project in the Philippines. Likewise, it has given the TroFCCA staff to get involved in the discussion on the development of methodology for vulnerability assessment. Several important meetings and workshops attended are listed below.

International Conference on Biodiversity and Climate Change, Manila, Philippines, 19-20 February 2008.

The conference provided a setting for discussing opportunities for adapting to and mitigating climate change while conserving biodiversity in Southeast Asia. ICRAF Philippines participated and co-sponsored the conference through provision of USD 1,000 from the TroFCCA project.

NCCCA+6 Post-Conference and Preparatory Meeting for the Asia Pacific Conference on Climate Change Adaptation (APCCCA), Manila, Philippines, 10 July 2008.

The meeting was conducted to present the initiatives of the Provincial Government of Albay on climate change adaptation six months after the first NCCCA. Also, the initiatives of the Philippine Congress and Senate, and the role of the Department of Foreign Affairs on climate change adaptation were discussed. Furthermore, the meeting provided a venue for refining the objectives and design of the first and pioneering Asia

Pacific conference on climate change adaptation with the theme: Local Governments take the lead". ICRAF Philippines is a co-organizer of the conference.

Linking Climate Change Adaptation to Sustainable Development in Southeast Asia – Science-policy workshop, Manila, Philippines, 24 September 2008.

This workshop brought together the policy community and the science community in the participating countries to discuss the appropriate climate change adaptation strategies and how they can be linked to the sustainable agenda of the countries involved. The key output were policy recommendations to facilitate the mainstreaming of climate change adaptation to sustainable development planning. The workshop is the final activity of the Asia Pacific Network For Global Change Research (APN) funded project "Linking climate change adaptation to sustainable development in Southeast Asia". ICRAF Philippines is the proponent of the project.

National Conference and Training Needs Assessment on Forests and Climate Change, Pasig City, Philippines, 30 September 2008.

The conference aimed to present the key findings of the 2007 Intergovernmental Panel on Climate Change report, more recent research results on climate change, and information on the role of forests in climate change mitigation; discuss opportunities and constraints of the Clean Development Mechanism and voluntary markets for forestry projects (including Afforestation/Reforestation and "Avoided Deforestation"); establish a network of carbon forestry project developers; increase the awareness of the Filipino private sector to opportunities in carbon forestry projects; and conduct a training needs assessment of various stakeholders in the Philippines for carbon forestry development and investment. The conference was organized by the Environmental Leadership and Training Initiative (ELTI), a joint program of the Yale School of Forestry & Environmental Studies and the Smithsonian Tropical Research Institute, and the World Agroforestry Centre (ICRAF-Philippines).

5. Staff Changes

In the Philippines TroFCCA is in partnership with the World Agroforestry Centre (ICRAF). Patricia Ann Sanchez, researcher left for her PhD study at Tokyo University in Japan under the Monbusho Scholarship. The project team now comprises of the following persons:

- Scientist and Coordinator: Dr. Rodel Lasco
- Researcher: Dr. Florencia Pulhin
- Research Assistant: Rafaela Jane Delfino

YEAR 4

MAIN ACTIVITIES

1. National Workshop on Forests and Climate change adaptation

The conference was highlighted by paper presentations on the results of the projects “Mainstreaming Climate Change Adaptation in Watershed Management and Upland Farming in the Philippines” and “Tropical Forest and Climate Change Adaptation (TroFCCA)” and invited papers on “best practices” and relevant experiences on climate change adaptation in the areas of watershed management, upland farming, and institutions. Among the paper presenters in the conference include Filipino members of the 2007 Intergovernmental Panel on Climate Change (IPCC) and recognized researchers and advocates/practitioners of climate change adaptation at the national and local level. At the end of the conference, a workshop was conducted to distill lessons from climate change adaptation experiences and recommend measures for their integration in policies and development plans.

2. Exploring the potentials of Ecosystem based Adaptation to Climate Change

Climate change is the greatest challenge faced by humanity today. Its far reaching consequences to natural ecosystems (IPCC, 2007, Berry, 2007) and human systems (IISD, 2003) are already being felt. And it will continue to worsen as precipitation pattern, extreme weather events and other related phenomena continue to change (IUCN, 2008).

Natural-resource dependent communities are and will be affected most severely as climate change threatens the services ecosystems provide such as food and fuelwood; regulation of water, climate and erosion; biodiversity; recreational, cultural and religious services. However, proper management and sustainable use of natural resources can allow for both ecosystems and people to adapt to climate change. In a policy brief (see attached), we tried to explain how ecosystem-based adaptation (EBA) can be an effective approach to build resilience and reduce risk for local communities and ecosystem.

Another publication (see draft article and policy brief) is under way reviewing the concept of Ecosystem based Adaptation and Mitigation (EbMA) and proposing a typology for EbMA. Cases from the Philippines will be presented to illustrate the opportunities and constraints of implementing EbMA in a developing country. Finally, we draw lessons and implications which could be useful in further developing EbMA.

3. Mainstreaming Climate Change Adaptation

TroFCCA in the Philippines has been actively involved in the process of integrating climate change adaptation into national policy and programs. TroFCCA staff are members of the (1) Technical Working Group of the Philippine Senate Committee on Environment and Natural Resources which has been instrumental in the passage and creation of the Climate Change Act of 2009; (2) Drafting of Medium Term Philippine development plan (MTPDP) commissioned by NEDA; and (3) Part of the preparation of the Philippines' Second National Communication which is set to be finalized next year.

At the local level, ICRAF remains to be a partner and technical adviser of the Province of Albay and the Center for Initiatives and Research on Climate Change Adaptation (CIRCA) which is moving ahead for climate change adaptation in the country.

4. Conference, seminars and workshops

ICRAF Philippines through the TroFCCA Project organized and co-sponsored various national and international conferences on climate change adaptation. These activities have been instrumental in finding and sharing knowledge and information for mainstreaming climate change adaptation and ecosystem-based adaptation. Several important meetings and workshops were also attended.

Major events organized and/or co-sponsored

National Conference on Climate Change Adaptation Practices in Natural Resources Management. June 29-30, 2009 Traders Hotel, Manila, Philippines.

The conference highlighted the paper presentations on the results of the projects “Mainstreaming Climate Change Adaptation in Watershed Management and Upland Farming in the Philippines” and “Tropical Forest and Climate Change Adaptation (TroFCCA)” and invited papers on “best practices” and relevant experiences on climate change adaptation in the areas of watershed management, upland farming, and institutions. Among the paper presenters in the conference include Filipino members of the 2007 Intergovernmental Panel on Climate Change (IPCC) and recognized researchers and advocates/practitioners of climate change adaptation at the national and local level. At the end of the conference, there was a workshop to distill lessons from climate change adaptation experiences and recommend measures for their integration in policies and development plans. (See attached Proceedings)

ASEAN Conference on Biodiversity. 21-23 October 2009, Republic Polytechnic, Singapore.

Themed “Biodiversity in Focus: 2010 and Beyond,” the Conference brought together over 300 key biodiversity stakeholders from the ASEAN region and other parts of the world to discuss the pressing issue of biodiversity loss. Held at the Republic Polytechnic in Singapore, it became a venue for discussions on emerging trends, issues, and concerns on biodiversity conservation and sustainable management. The Conference was co-organized by the World Agroforestry Centre and hosted by the ASEAN Centre for Biodiversity (ACB) and the National Parks Board, Singapore (NParks).

Second National Conference on Climate Change Adaptation (NCCA+2). October 2009, Diamond Hotel, Manila, Philippines.

The **National Conference on Climate Change Adaptation +2** looked back at the gains of the First Conference after two years (First National Conference on Climate Change Adaptation was held on 22-24 October 2007 at the Provincial Capitol, Albay, Philippines) of concerted efforts and how national and local policies have been translated into actions in the light of international developments. Almost 300 representatives from national

agencies, local governments, academe, NGOs and other interest groups participated and informed of the developments in international policy discussions on climate change, particularly adaptation as it relates to disaster risk reduction and mitigation. Discussions in plenary were structured around the Philippine climate scenario (from the Second National Communication to UNFCCC) and the advances made in national and local policies as in the National Strategic Framework on Climate Change Adaptation. These plenary sessions set the frame for the parallel regional-thematic/sectoral sessions where participants can discuss further issues and actions towards adaptation. The Second Conference served as a venue to validate the relevance of the National Strategic Framework on Climate Change Adaptation to local governance.

The final output of the conference was the Manila Declaration which the group formally turned over to President Gloria Macapagal-Arroyo in Malacañang on the third day. The Manila Declaration affirmed the government's commitment to the United Nations Framework Convention on Climate Change and the recently-enacted Climate Change Act of 2009. (www.albaycirca.org)

National Forum on Climate Change. 16 November 2009. Manila Hotel, Manila, Philippines.

The Philippine National Academy of Science and Technology (NAST) Task Force on Climate Change, in collaboration with the World Agroforestry Centre (ICRAF), Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) and other institutional agencies organized the National Forum on Climate Change at the Manila Hotel on 16 November 2009. Originally scheduled on 12 October 2009, the forum was postponed to allow all agencies and parties concerned to attend to the calamity stricken areas in various parts of the country.

The National Forum focused on the concerns of developing countries like the Philippines with regards to climate change. Specifically it aimed to: 1) understand the current state of climate change and the projections on how it is going to play out in the medium- and long-term; 2) identify gaps in the understanding of efficient mitigation and adaptation options for the Philippines, especially in the context of the development agenda; and 3) identify the priority research agenda for the Philippines, with the long-term view of developing the country's analytical capacity on climate change. (www.nast.ph)

Publications

Lasco RD, Pulhin FB, Sanchez PAJ, Delfino RJP, and Garcia K. 2009. Mainstreaming Climate Change in Developing Countries: The case of the Philippines. *Climate and Development Journal*; 1 (2009) 130-146.

Lasco RD. Beyond AR4: Updates on the International Discussions on Climate Change Adaptation. Paper Presented during the National Conference on Climate Change Adaptation + 2. October 26-27, Manila, Philippines.

Lasco RD and Delfino RJP. Ecosystems-based Adaptation in developing countries: Opportunities and Constraints in the Philippines. Paper Presented during the ASEAN Conference on Biodiversity 2008, October 21-23, 2009, Singapore.

Lasco RD, Delfino RJP, and Pulhin FB. 2009. Exploring Synergies for Integration: Adaptation to Climate Change and Ecosystem Management. Poster presented during the 2nd World Congress of Agroforestry. 23-28 August 2009 Nairobi, Kenya.

Lasco RD, Delfino RJ and Pulhin FB. 2009. Exploring Synergies for Integration: Adaptation to Climate Change and Ecosystem Management. Bogor, Indonesia. World Agroforestry Centre - ICRAF, SEA Regional Office.

Lasco RD and Delfino RJP. 2009. Building Communities' Resilience to Climate ChangeL The Potential of Ecosystem Based Adaptation (EBA). Policy Brief.

Lasco RD, Delfino RJP, and Pulhin FB. 2009. Proceeding of the National Conference on Climate Change Adaptation Practices in Natural Resources Management. World Agroforestry Centre (ICRAF) Philippines.

TroFCCA Philippines Flyer. 2009. Version 2.

Lasco RD, Delfino RJP.--.Ecosystem-based mitigation and adaptation in developing countries: Opportunities and constraints in the Philippines. Still under development.

Lasco RD, Habito MC, Delfino RJP and Pulhin FB. --. Climate Change Adaptation Guidebook for Smallholder Farmers in Southeast Asia. Still under development.

APPENDICES

Abstract of papers and presentations

TROPICAL FORESTS AND ADAPTATION TO CLIMATE CHANGE: THE TROFCCA POLICY RESEARCH FRAMEWORK ON ACTORS, DECISION-MAKING AND POLICY NETWORKS

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Impacts of climate change will affect forest ecosystem goods and services (FEGS) as well as the livelihoods of people dependent on those FEGS. To minimize the risk of growing vulnerability, there is an urgent need for mitigation as well as for adaptation options to respond to existing and projected climate change impacts.

The overall aim of TroFCCA (Tropical Forests and Climate Change Adaptation) as a research project is to mainstream adaptation strategies related to forest ecosystem goods and services into development policies. TroFCCA is working in different regions and countries (West Africa, Asia, and Central America) and on forest goods and services relevant for development topics or sectors defined during stakeholder meetings in the regions. TroFCCA is addressing the coupled biophysical and socio-economic system that characterizes the provision and use of forest goods and services. The vulnerability analysis of such a system is assessed according to the exposure, sensitivity and adaptive capacity concepts following IPCC definitions. The research activities undertaken by TroFCCA's policy research focus strongly on adaptive capacities of the stakeholders involved in the decision and policy making processes across scales and across sectors that are relevant for forests and adaptation to climate change.

A common approach for TroFCCA's policy analysis was developed and is presented here. The paper introduces the approach and the methods and tools (policy network analysis) used in the different regions, related to the regional or country-wise specific topics, levels of activity (regional, national, sub-national, local) and present first results of our on-going research activities. Preliminary results show the need for a comprehensive analysis of the political and institutional context and of the actors involved in decision making and the structural conditions (linkages, bridges, gaps) in the policy arena to achieve a successful mainstreaming of identified adaptation strategies into policy needs.

Keywords: Adaptation, climate change, decision making processes, multi-stakeholder processes, policy network analysis.

MAINSTREAMING CLIMATE CHANGE ADAPTATION IN FOREST AND NATURAL RESOURCES MANAGEMENT IN THE PHILIPPINES: THE ROLE OF LOCAL GOVERNMENTS

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Success in implementing climate change adaptation depends to a large extent on the participation of local government officials. In many cases, climate change discussion is confined at the national level to little action in the field. One of the main challenges in promoting climate change adaptation at the local level is the lack of appreciation by local leaders on the need to adapt to climate change. This is because climate change is seen as a long-term problem and thus of less importance than more pressing needs. One exception to this is Albay province in the Philippines. At the initiative of the provincial governor, there is a strong push to adapt to climate change.

In this paper, we document the strong uptake of climate change adaptation options by the local government, explore the reasons that led to this, and their implications to climate change adaptation in forestry and natural resources management. The provincial leadership sponsored the first-ever national climate change adaptation conference with the President herself attending. Subsequently, a climate change center was created in the province. In addition, several bills were filed in the legislative branch to support climate change adaptation. Among the reasons for the elevated interest from the local government of Albay is that the province is buffeted by strong typhoons annually so that policy makers have an high appreciation of climate-related disasters. In addition, the governor and his staff have strong understanding of climate change issues. Here we discuss the implications of the experience in Albay in mainstreaming climate change adaptation into forestry and natural resources management in developing countries. These include finding an appropriate context, the role that mesoscale local government units can play, and its potential limitations. Key words: adaptation, forestry sector, local governments, small farmers, watersheds.

THE ROLE OF LOCAL GOVERNMENT UNITS IN MAINSTREAMING CLIMATE CHANGE ADAPTATION IN THE PHILIPPINES

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The province of Albay shows the key role of local governments in promoting climate change adaptation. Provinces which experience frequent and severe climate hazards are more likely to be aware and responsive to the need for climate change adaptation. Local government units at the provincial scale (meso scale) do have resources to commit to climate change adaptation. And, there is opportunity to integrate climate change adaptation on existing disaster risk management (DRM) institutions and programs.

AIR POLLUTION, CLIMATE CHANGE AND TROPICAL FORESTS - EXPLORING THE LINKAGES

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There has been increasing awareness on the importance of simultaneously addressing the linkages between the traditional air pollutants (APs) and greenhouse gases (GHGs) and its combined effects on forest ecosystems. Aside from the fact that APs and GHGs have common sources, their emissions interact in the atmosphere and cause a variety of environmental effects. Parallel to the rise of concern for climate change, there is also high interest on the role of forests for carbon sequestration and storage, among other environmental services. Here, we review the links between air pollution and climate change, its integrated effects on forest ecosystems and the opportunities they present for preserving the forest. Also, the roles of forest in addressing air pollution and climate change are explored. The ways by which forest management in the Philippines can curb the rate of increase of GHGs in the atmosphere are provided to have a clear view of the role of forest in addressing climate change. Knowledge gaps, challenges and concerns on the linkages and opportunities will be presented.

MAINSTREAMING CLIMATE CHANGE IN DEVELOPING COUNTRIES: THE CASE OF THE PHILIPPINES

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The Philippines, as an archipelago and a developing country, is very vulnerable to climate change. Current efforts to address the impacts of climate change exist but may not be sufficient. The first part of this paper reviews current knowledge on mainstreaming climate change adaptation into development. It then assesses how far climate change has been mainstreamed into key development plans and programmes in the Philippines. Interviews with key informants were also conducted. The results show that there is no mainstreaming in the Philippines. All the major development plans and policies reviewed did not contain any reference to climate change adaptation. Interviews with key stakeholders reveal a similar trend. The main reason preventing mainstreaming are that national priorities are biased towards concerns deemed more pressing, and that there is a pervasive lack of awareness about the impacts of climate change on sustainable development. However, there are massive investments in infrastructure projects designed to adapt to weather-related hazards. Projects such as these could provide an entry point for integrating climate change adaptation into development plans and policy in the Philippines.

EXPLORING SYNERGIES FOR INTEGRATION: ADAPTATION TO CLIMATE CHANGE AND ECOSYSTEM MANAGEMENT.

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The Philippines is one of the most vulnerable countries to climate-related disasters which could be exacerbated by climate change. Here, we present the key role of local government in promoting climate change adaptation by showing the experience of a local government unit (province of Albay) in mainstreaming climate change adaptation in the Philippines. This shows how climate change came to be considered by the local government through (1) the emergence of *champions* among local government officials; (2) climate change as a significant consideration within local government decision

making and in land use plans; and (3) mobilization and allocation of financial resources to commit to climate change adaptation. Provinces, which experience frequent and severe climate hazards, are more likely to be aware and responsive to the need for climate change adaptation. We also highlight how climate change issues can be integrated in existing climate-related management initiatives like on avoiding or limiting impacts from strong typhoons and heavy rainfall and also on the impacts on natural resources which is illustrated by their efforts at mangrove rehabilitation. Two specific institutions, CIRCA and APSEMO, are provided to have a clear of view of how Albay is doing the work. The potential role of agroforestry systems in climate change adaptation in the province is discussed.

BUILDING COMMUNITIES' RESILIENCE TO CLIMATE CHANGE: THE POTENTIAL OF ECOSYSTEM BASED ADAPTATION (EBA)

Policy Brief. World Agroforestry Centre (ICRAF), Los Baños, Laguna, Philippines.

Lasco, Rodel D. and Delfino, Rafaela Jane P., World Agroforestry Centre (ICRAF), Khush Hall, IRRI Campus, College, 4031 Laguna, Philippines

Climate change is the greatest challenge faced by humanity today. Its far reaching consequences to natural ecosystems (IPCC, 2007, Berry, 2007) and human systems (IISD, 2003) are already being felt. And it will continue to worsen as precipitation pattern, extreme weather events and other related phenomena continue to change (IUCN, 2008).

Natural-resource dependent communities are and will be affected most severely as climate change threatens the services ecosystems provide such as food and fuelwood; regulation of water, climate and erosion; biodiversity; recreational, cultural and religious services. However, proper management and sustainable use of natural resources can allow for both ecosystems and people to adapt to climate change. This policy brief explains how ecosystem-based adaptation (EBA) can be an effective approach to build resilience and reduce risk for local communities and ecosystem.

Ecosystem-based mitigation and adaptation in developing countries: Opportunities and constraints in the Philippines.

Draft. Working Paper.

Lasco, Rodel D. and Delfino, Rafaela Jane P., World Agroforestry Centre (ICRAF), Khush Hall, IRRI Campus, College, 4031 Laguna, Philippines

In spite of mitigation efforts, the world's climate is slowly changing and its impacts are being felt. Small farmers who rely heavily on natural ecosystems are specially vulnerable to climate change. A promising strategy to meet the adaptation and mitigation goals of the global community is ecosystems-based mitigation and adaptation (EbMA). In this paper, we reviewed the concept of EMA and propose a typology for EMA. We present cases from the Philippines to illustrate the opportunities and constraints of implementing EMA in a developing country. Finally, we draw lessons and implications which could be useful in further developing EMA.