FINAL REPORT for APN PROJECT

Project Reference Number: CBA2013-16NSY-Dargantes

Strengthening the Capability of Colleges of Agriculture in Incorporating Food and Water Security and Climate Change and Climate Variability into Curricular Programs, Research and Extension Projects and Teaching Modules

- Making a Difference –

Scientific Capacity Building & Enhancement for Sustainable Development in Developing Countries

The following collaborators worked on this project:

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Strengthening the Capability of Colleges of Agriculture in Incorporating Food and Water Security and Climate Change and Climate Variability into Curricular Programs, Research and Extension Projects and Teaching Modules

Project Reference Number: CBA2013-16NSY-Dargantes
Final Report submitted to APN

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OVERVIEW OF PROJECT WORK AND OUTCOMES

Non-technical summary

This project intended to assist colleges of agriculture in incorporating topics on food and water security and climate change and climate variability into curricular programs, research and extension projects and teaching modules. The major highlight of the project was the Conference on Strengthening University Programs to Enhance Water and Food Security in a Changing Climate, which was held on 13-15 August 2014 at the Visayas State University (VSU), City of Baybay, Leyte, Philippines.

During the Conference, the participants discussed various issues and shared relevant experiences and good practices during sessions on: 1) adaptation and mitigation initiatives to ensure food and water security in a changing climate; 2) water resource management and water service delivery in the face of a changing climate; and, 3) governance and institutional development to ensure food and water security in a changing climate.

Moreover, the Conference participants signified to: 1) continue conducting more intensive research on the mapping and characterization of peatlands in Indonesia, the Philippines and Cambodia; 2) come up with unified methodologies in the characterization of watersheds, initially utilizing the Watershed Information Management Systems (WIMS) being developed at VSU, while exploring the integrative potential of WIMS and the SWAT Hydrology Model being refined at the Institut Pertanian Bogor (IPB), and testing the applicability of the land use evaluation systems being promoted by Universitas Gadjah Mada (UGM); and, 3) work on the introduction of common courses in the agriculture curricula among Association of Southeast Asian Nations (ASEAN) universities.

Keywords:

Colleges/Faculty of Agriculture, Water Security, Food Security, Climate Change, Climate Variability, Agricultural Curricula, Agricultural Research and Extension, Teaching Modules

Objectives

The main objectives of the project were:

1. To generate a broader understanding of the water and food security dimensions of climate change in the Asia-Pacific region, and come up with a synergy of efforts to address the pertinent issues;
2. To expand the dissemination and sharing of relevant experiences and good practices, and to have more focus in the setting of inter-university research and extension activities; and,
3. To foster academic exchange and complementation for inter-country sharing of relevant experiences and good practices.

Amount received and number years supported

The Grant awarded to this project was:
US$ 43,000 for Year 1:

Activities undertaken

Formation of Project Secretariat

The project was implemented in the Philippines by the Institute for Strategic Research and Development Studies (ISRDS) of College of Management and Economics (CME) of VSU, which also served as the project secretariat. In Indonesia, the major project partners were the Land Resources Study Centre (LRSC) of the Faculty of Agriculture of UGM, and the Centre for Climate Risk and Opportunity Management in Asia and the Pacific (CCROM-AP) of Institut Pertanian Bogor (IPB). In Cambodia, the Faculty of Agro-industry (FAI) and the Graduate School of the Royal University of Agriculture (RUA) were the main partners. The project secretariat took the lead in conducting the inter-university meetings, and in organizing the Conference.

Inter-University Project Planning Meeting

The project planning meeting was held on 28-30 October 2013 at the UGM, Yogyakarta, Indonesia in order to confirm the initial detailed project implementation plan, and to identify potential country-level experiences and good practices. More specifically, the meeting aimed to:

1. Enhance the understanding of the team members of the concept of the project;
2. Identify and select appropriate methodologies for project implementation;
3. Discuss updates regarding the various country papers submitted to Southeast Asian Regional Centre for Graduate Study and Research in Agriculture (SEARCA) for the occasion of the 6th Executive Forum on Natural Resources Management: Water and Food in a Changing Environment; and,
4. Arrive at a common understanding of the financial practices being followed by the Visca Foundation for Agricultural and Rural Development (ViFARD), Inc., and the Asia-Pacific Network for Global Change Research (APN).

Documentation and Mapping of Relevant Experiences and Good Practices

During the project planning meeting, university partners confirmed the need to document experiences and practices related to the incorporation of water and food security, and climate change issues into agricultural curricular programs, and into research and extension (R&E) projects of partner universities. Another area of concern that the project partners agreed to look into were the capability-building activities to support the mainstreaming of Climate Change Adaptation and Mitigation Initiatives in Agriculture (AMIA), and to strengthen policy making at the national level especially by linking scientists and politicians.

With respect to university instruction, experiences in raising student awareness to policies, and in policy analysis and development in relation to food and water security, programs on land and water management, and climate change and variability were considered for inclusion in the documentation exercise. Another area of interest was the accreditation of agriculture practitioners and programs in the various members of the ASEAN.

Inter-University Sharing of Relevant Experiences and Good Practices

The meeting for the initial sharing of relevant experiences and good practices was held on 2-6 February 2014 in Siem Reap, Cambodia. It envisioned providing project partners an opportunity to share localized research results and adaptation activities, to identify possible transboundary initiatives, and to develop partnerships and collaborative projects in teaching, research and community outreach that could transcend national boundaries. More specifically, it aimed to:

1. Discuss the technical content of the various country papers for possible publication in the APN Science Bulletin;
2. Come up with an initial consolidation of documented relevant experiences and good practices, and initial write-up of the proposed technical papers for publication in the APN Science Bulletin; and,
3. Initially discuss the research, development and extension (RDE) proposals that were identified during the First Inter-University Meeting.

Conference on Strengthening University Programs to Enhance Water and Food Security in a Changing Climate, and Preparation and Dissemination of Project Outputs

The Conference was envisioned to provide a platform for an interface between policymakers and scientists into understanding global change, and into undertaking common action. More specifically, it aimed to:

1. Improve the effectiveness of scientists and professors in contributing to the formulation of relevant policies for mainstreaming climate change adaptation and mitigation initiatives in agriculture;
2. Improve the awareness of policymakers to the scientific basis of climate change adaptation and mitigation initiatives, and their implications to food and water security; and,
3. Increase student awareness to relevant policies, and improve student capability in policy analysis and development for mainstreaming climate change adaptation and mitigation initiatives in agriculture.

Results

Improvement of Agriculture Curricula

The project intended to enrich traditional agriculture curricula, and to improve competencies of students and graduates in dealing with changes in the implementation of agricultural activities worldwide. One of the proposals involved the possible inclusion of the course on Agro-Ecosystems Management in the Bachelor of Science (BSc) in Agriculture curriculum. In VSU, this course has been offered to students pursuing BSc degree in Biology major in Ecology, and in Environmental Management, but not to BSc in Agriculture students. Another proposal involved the introduction of the course Advances in Soil and Water Conservation and Management, which would include topics that would address climate change.

Enrichment of Courses through Research

The papers of Maas (2014) and Batistel (2014) provided significant contributions for the enrichment of graduate courses through the emphasis on expanding research into the utilization of peatlands in insular Southeast Asia. Although Maas (2014) and Batistel (2014) conducted erstwhile separate studies on peatlands, the sharing of experiences and research results pointed out the need to pursue graduate-level study of peatlands utilization, conversion and management both in Indonesia and the Philippines.

Despite their diversity, the papers of Tabada (2014), Suharnoto (2014), Dargantes (2014), Celeste (2014), Modina (2014) and Maas (2014), provided the impetus for researchers from VSU, IPB and UGM to collaborate and come up with unified methodologies for watershed characterization and land use evaluation. Making this a reality would require the continuation of these separate studies, the establishment of an ASEAN-wide integrative mechanism, and incorporating the lessons into curricular offerings and teaching content.

Publication and Dissemination

Half-way through the project, the university partners were able to come up with a paper, which was published as:

Dargantes, B.B., Maas, A., Suharnoto, Y.,Wibowo, A., Ek, S., Huon, T., and Batistel, C. (2014). University Initiatives for Food and Water Security in a Changing Climate. APN Science Bulletin. Issue 4, March 2014. pp177-180.

In addition, the project compiled relevant experiences and good practices related to enhancing food and water security, and climate change. This compilation included cases in the Philippines such as: 1) Experiences in Mainstreaming Climate Change in Agriculture: Strategies, Problems and Issues; 2) the RDE Program of the VSU Regional Climate Change Center; 3) ISRDS Post-Haiyan Training Initiatives to Rehabilitate Livelihood Systems in Affected Communities; and, 4) the VSU-College of Agriculture (VSU-CA) Research and Development (R&D) Agenda for Food Security in the Context of Climate Change. Documented initiatives in Indonesia included: 1) Evaluation System for Converted Peatlands in Relation to Fire Hazards and Government Policy; and, 2) SWAT Hydrology Model and Drought Anticipation. Reported experiences in Cambodia included: 1) Issues and Concerns Regarding Water Management for Food Production and Agricultural Education in Cambodia; and, 2) Natural Resource Management and Rural Development Programs at RUA of Cambodia.

Relevance to the APN Goals, Science Agenda and to Policy Processes

The whole project, and the Conference for that matter, was conceptualized in line with the scientific capacity development, awareness raising and dissemination of information pertaining to climate variability and climate change, agro-ecosystems and land use management, resource utilisation and sustainable development options being espoused by the APN. More specifically, the project intended to address challenges faced by faculties of agriculture in adapting their respective curricular programs, research and extension activities, and teaching modules to local needs and conditions. These challenges included confronting the adverse impacts of climate variability (e.g. extreme rainfall events accompanying monsoon surges) and of climate change (e.g. increased occurrence of typhoons during months when these weather events were supposed to be rare) on water and food security in the different bio-regions of Asia-Pacific. In view of the trans-local nature of these issues, faculties of agriculture expressed the need to share localized research results and adaptation activities, to identify transboundary initiatives, and to further strengthen university capability in teaching, research and extension that take into consideration shared experiences and good practices.

The project targeted scientific personnel in faculties of agriculture to enhance their research on topics related to global climate change, and to develop partnerships and collaborative projects in teaching, research and community outreach that transcend national boundaries. Project activities were envisioned to enhance their capacity to improve environmental monitoring and assessments through more accurate databases, and the application of geographic information systems for data collection, verification and updating. In addition, the collaboration and partnership between natural and social scientists, and policy makers could strengthen policy and decision-making at various levels through the use of scientific knowledge and of local and indigenous knowledge for integrated risk assessments, and the application of interdisciplinary and intersectoral approaches while reaffirming the precautionary approach to protecting the environment.

For the ISRDS, the project was expected to contribute to the activities of the Initiatives on the Sociology of Development in (Southeast) Asia (ISDA) by addressing the curricular requirements of incorporating climate change and climate variability into the teaching of sustainable agriculture and

rural development, and by identifying local research gaps for ensuring food and water security in a changing environment. The inter-university collaboration mechanism of the project could further complement national efforts in terms of regional-level agenda for research and extension and of country-level sharing of relevant experiences and teaching of good practices.

Self evaluation

As a whole, the project was able to contribute to the generation of a broader understanding of the water and food security dimensions of climate change, and to the dissemination of relevant experiences and good practices as inputs into a more focused setting of inter-university research and extension activities. It also fostered academic complementation for inter-country sharing of experiences. For example, the Conference on Strengthening University Programs to Enhance Water and Food Security in a Changing Climate provided professors, researchers and students insights into the search for alternative directions on the advocacy of the importance of water and food in a changing climate. These options ranged in scope from formal university courses and planned learning experiences to the provision of knowledge and skills as bases for localized interventions. As one participant remarked, "the discussions pointed out the need to mainstream climate change in the university and (to) embrace it to help contribute in mitigation and adaptation."

Potential for further work

The conference participants signified their interest to continue conducting more intensive research on the mapping and characterization of peatlands in Indonesia, the Philippines and Cambodia—especially that mismanaged peatlands could contribute to climate change. Researchers from participating universities also articulated their desire to come up with unified methodologies in the characterisation of watersheds. These efforts could initially utilize the WIMS being developed at VSU, and later explore the integrative potential of WIMS and the SWAT Hydrology Model being refined at the IPB. Using the WIMS and the SWAT Hydrology Model as platform, the applicability of the land use evaluation systems being promoted by UGM could be tested further. Lastly, work on the introduction of common courses in the agriculture curricula among ASEAN universities could be started as a mechanism for knowledge sharing.

Publications (please write the complete citation)

Dargantes, B.B., Maas, A., Suharnoto, Y.,Wibowo, A., Ek, S., Huon, T., and Batistel, C. (2014). University Initiatives for Food and Water Security in a Changing Climate. APN Science Bulletin. Issue 4, March 2014. Pp177-180.

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Batistel, C. (2014) Lessons Learned from Peatland Conversions in Aceh, Indonesia: Implications to Research and Development in Philippine Peatlands. Paper presented during the Conference on Strengthening University Programs to Enhance Water and Food Security in a Changing Climate held on 13-15 August 2014 at VSU, Baybay City, Leyte, Philippines

Dargantes, B.B., M.B. Manahan, and C.C. Batistel. (2011) Treading Troubled Waters. Focus on the Global South. Quezon City, 60pp.

Dargantes, B.B., C.C. Batistel, and M.A.T.W. Tabada. (2011) Challenging National Development Agenda: What Policies Address Issues in the Visayas. Focus on the Global South. Quezon City, 38pp.

Dargantes, B.B., Maas, A., Suharnoto, Y.,Wibowo, A., Ek, S., Huon, T., and Batistel, C. (2014) University Initiatives for Food and Water Security in a Changing Climate. APN Science Bulletin. Issue 4, March 2014. Pp177-180.

Kada, Ryohei. (2012) Ecology-Related Risks on Water, Food Safety and Security, and Health, Paper presented during the Sixth Executive Forum on Natural Resource Management: Water and Food in a Changing Environment held on 11-13 April 2012 at SEARCA, Los Baños, Laguna, Philippines

Maas, A. (2014) Evaluation System for Converted Peatlands in Relation to Five Hazards and Government Policy. Paper presented during the Conference on Strengthening University Programs to Enhance Water and Food Security in a Changing Climate held on 13-15 August 2014 at VSU, Baybay City, Leyte, Philippines

Acknowledgments

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We also express our gratitude to the VSU administration, especially Dr. Jose L. Bacusmo, VSU President, Dr. Othello B. Capuno, VP for Research and Extension, Dr. Edgardo E. Tulin, VP for Instruction, and Dr. Roberto C. Guarte, VP for Administration and Finance, for allowing the project team to use university facilities in the implementation of the various activities; to the ISRDS particularly Ms. Maria Aurora Teresita W. Tabada, the Director, Dr. Myrna M. Avila, the Training Coordinator; and the support staff (Ms. Leonarda A. Maurillo, Ms. Teresita Y. Cosares, Mr. Narciso P. Mazo, Mr. Mizael B. Cerna, and Mr. Generoso P. Vequizo) for administrative support during project implementation; to ViFARD, Inc., especially Dr. Wolfreda T. Alesna, Executive Director, for facilitating the financial transactions of the project and for allowing Ms. Helina F. Ramos and Ms. Florencia G. Valenzona to devote time for the project financial operations.

We also wish to thank the leadership of the Faculty of Agriculture of UGM (particularly Dr. Jam Hari, Dean, and Dr. Ir. Sri Huryani Hidayah Utanu, Vice Dean II), of the CCROM-AP of IPB, and of the Faculty of Agricultural Technology and Management and the Graduate School of RUA for allowing the project partners to share their experiences to other academicians in Southeast Asia.

TECHNICAL REPORT

Preface

The major highlight of the project was the Conference on Strengthening University Programs to Enhance Water and Food Security in a Changing Climate. It was held on 13-15 August 2014 at the Visayas State University, City of Baybay, Leyte, Philippines. During the Conference, participants discussed various issues and shared relevant experiences and good practices during sessions on: 1) adaptation and mitigation initiatives to ensure food and water security in a changing climate; 2) water resource management and water service delivery in the face of a changing climate; and, 3) governance and institutional development to ensure food and water security in a changing climate.

Conference participants signified to: 1) continue conducting more intensive research on the mapping and characterization of peatlands in Indonesia, the Philippines and Cambodia; 2) come up with unified methodologies in the characterization of ecosystems using watersheds as the unit of analysis, initially utilizing the WIMS developed at VSU, trying out the integrative potential of WIMS with the SWAT Hydrology Model being refined at IPB, and testing the applicability of the land use evaluation systems being promoted at UGM; and, 3) work on the introduction of common courses in the agriculture curricula among ASEAN universities.

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1.0 Introduction

Rationale

During the 6th Executive Forum on Natural Resources Management that was organized by SEARCA, Kada (2010) pointed out how ecological degradation had affected food supply and safety in many Southeast Asian countries, and how food and health risks had gotten worse due to the impacts of a changing climate. Whereas these circumstances, which had been felt directly by farmers, redefined opportunities for food production, they also required an urgent review of food security and rural development strategies, which, in turn, would necessitate that the science community link up with local communities and governments and share its knowledge to find effective ways to make the modalities of natural resources utilization and management more climate resilient.

In Indonesia, over 110 million rural people earn less than US$2 a day, and rely on farms that are getting smaller. Nonetheless, agriculture contributes about 15 percent to the Gross Domestic Product (GDP), and has helped the economy recover from the financial crisis. This sector, however, is vulnerable to climate change, while being a significant contributor to greenhouse gas (GHG) emissions—peat burning alone contributes about 469 metric tons (MT) of carbon dioxide (CO_2) per year. Moreover, extreme climate events associated with the El Niño Southern Oscillation (ENSO) have significantly reduced dry season rainfall during warm ENSO episodes, while significantly increasing rainfall during cold episodes.

UGM has been studying the historical changes of Indonesian climate, the impact of climate variability on food crop production as well as the adaptation and mitigation measures being implemented at the community and farm levels. On the other hand, the IPB has been advocating for policies and plans that take into account climate change to increase the resilience of agricultural systems to climate risks. Both universities have worked on the institutionalisation of the use of climate information in agricultural management and development on giving priority to structural interventions to minimise climate risks, and on expanding agriculture to areas with lower climate risks. These interventions included on developing varieties that resist drought, flood and high salinity, climate modelling, and adoption of mitigation and adaptation technologies. Work had also been undertaken on the use of the tropical peatlands of Indonesia, which cover some 20 million hectares or about 10% of total land area, for biomass production and for their agricultural potential. Such level of work could achieve greater relevance through the exchange of research information. Eventually, the research outputs could serve as significant inputs into the incorporation of climate information, into university teaching as well as in the implementation of agricultural extension programs, not only among Indonesian universities but also among those in insular Southeast Asia.

The FAI of RUA of Cambodia, offers courses on water resources management for food production in its curriculum. It conducts research on hydrology, groundwater, irrigation and drainage for agricultural production, water use efficiency and water pollution in the peri-urban areas of Phnom Penh. It also implements projects that strengthen farmer-water-user committees and promote inclusiveness and environmental health, and projects that are pro-poor, pro-women and pro-environment. The university seeks to examine the link between climate change, water, and food production, identify water management policies that help achieve food security while responding to environmental change, and contribute to higher education in the field of water resource management. Through these initiatives, RUA could share its experiences in integrating climate change issues into instructional curricula and materials, into research and development programs, and into community outreach with other faculties of agriculture.

A substantial portion of the Philippine population still depends on agriculture for their livelihood; and irrigation is considered a crucial element of production. The construction of dams and other

water impounding structures, however, have inadvertently deprived many downstream rice production areas of water, leaving previously irrigated paddies to fallow. The reduced productivity of many farms has led farmers to abandon their lands in search of better options. In view of such situations, the Visayas State University has been involved in research and extension activities that deal with critical issues in the water sector. These activities have included action-cum-research on rural water systems; on access to, availability of and safety of water supplies; on organizations and governance model for watersheds and water service delivery systems; and, on conflicts over water resources.

In view of these university-level experiences, this project was proposed as an attempt to provide a venue for the exchange of knowledge and information among planners, scientists, experts and practitioners on the issues, challenges and imperatives of development and environmental nurturance, and on the impacts of a changing environment on water and food production. The project would provide participating faculties of agriculture in the Philippines, Indonesia and Cambodia an opportunity to gain access to regional research programmes in sustainable development, and build greater capacity in science and technology. This would also improve collaboration and partnerships between and among research institutions, universities, governmental agencies, and scientists and academicians. The project could enhance the search for cleaner products and production technologies, and encourage the transfer and diffusion of such technologies. Further, the participating universities could establish channels between policy makers and the scientific community to strengthen networks for sharing knowledge, experience and best practices, and for building scientific and educational capacities for sustainable development. Through information and communication technologies, the sharing of experiences and knowledge could increase, and the quality of and access to information from relevant international and regional fora could improve.

It hoped to build on community-based adaptation strategies that promote water-efficient and climate-resilient food production. In addition, it would allow for the integration of local knowledge with applicable science in an effort to make planners and decision makers take proactive actions on climate-related risks, and encourage them to incorporate these actions into development programs, while creating greater awareness to strategies that reduce climate-related risks on food availability in a changing environment; and facilitating the adoption of proactive policies that support green growth and science-based programs.

Objectives

1. To generate a broader understanding of the water and food security dimensions of climate change in the Asia-Pacific region, and come up with a synergy of efforts to address the pertinent issues
2. To expand the dissemination and sharing of relevant experiences and good practices, and to have more focus in the setting of inter-university research and extension activities
3. To foster academic exchange and complementation for inter-country sharing of relevant experiences and good practices among in-country networks

2.0 Methodology

Formation of Project Secretariat

The project was implemented in the Philippines by the ISRDS of CME of the VSU, which also served as the project secretariat; in Indonesia by the Land Resources Study Centre of the Faculty of Agriculture, UGM, and the Centre for Climate Risk and Opportunity Management in Asia and the

Pacific of IPB. In Cambodia, the Faculty of Agricultural Technology and Management, Royal University of Agriculture (RUA).

The project secretariat took the lead in conducting the inter-university meetings, and organised the project conference. These activities were intended to expand opportunities for raising awareness to and for building the capability of project partners in incorporating climate change and climate variability in teaching and research. For such initiatives, partner institutions linked with policymakers to demonstrate the practical applications of improved knowledge on sustainable agriculture and rural development programs, and of better understanding of global change on people's welfare, and to spur policymakers and scientist into undertaking common action.

Inter-University Project Planning Meeting

The project planning meeting was held on 28-30 October 2013 at the UGM, Yogyakarta, Indonesia in order to confirm the initial detailed project implementation plan, and to identify potential country-level experiences and good practices. More specifically, the meeting aimed to:

1. Enhance the understanding of the team members of the concept of the project;
2. Identify and select appropriate methodologies for project implementation;
3. Discuss updates regarding the various country papers submitted to SEARCA for the occasion of the 6th Executive Forum on Natural Resources Management: Water and Food in a Changing Environment; and,
4. Arrive at a common understanding of the financial practices being followed by the Visca Foundation for Agricultural and Rural Development (ViFARD), Inc., and the Asia-Pacific Network for Global Change Research (APN).

The meeting was attended by:

Name	Position and Affiliation	Address
Prof. Dr. Azwar Maas	Head, Center for Land Resources Study, Faculty of Agriculture, UGM	Bulaksumur, Yogyakarta, Indonesia
Mr. Makruf Nurudin	Instructor, Department of Soil Science, Faculty of Agriculture, UGM	Bulaksumur, Yogyakarta, Indonesia
Dr. Jam Hari	Dean, Faculty of Agriculture, UGM	Bulaksumur, Yogyakarta, Indonesia
Dr. Ir. Sri Huryani Hidayah Utanu	Vice Dean II Faculty of Agriculture, UGM	Bulaksumur, Yogyakarta, Indonesia
Dr. Ir. Yuli Suharnoto	Researcher, Center for Climate Risk and Opportunity Management in Southeast Asia and the Pacific, IPB	Bogor, Indonesia
Mr. Arif Wibowo, M.Sc.	Head, Division for Climate Change Vulnerability, Assistant Deputy for Climate Change Adaptation, Ministry of Environment	4th Floor, Building B, Jl. D.I. Panjaitan Kau 24, Kebon Nanas, Jakarta, Indonesia
Mr. Sopheap Ek	Vice Dean, Faculty of Agricultural Technology and Management, RUA	Pnom Penh, Cambodia
Dr. Thavrak Huon	Dean, Graduate School, RUA	Phnom Penh, Cambodia
Prof. Dr. Buenaventura Dargantes	Professor of Socio-ecology, Institute for Strategic Research and Development Studies, College of Management and Economics, VSU	Baybay City, Leyte, Philippines

Ms. Cheryl Batistel M.Sc.	Instructor, Department of Biological Sciences, College of Arts and Sciences, VSU	Baybay City, Leyte, Philippines
Ms. Helina Ramos	Finance Officer, Visca Foundation for Agriculture and Rural Development, Inc. (ViFARD)	Baybay City, Leyte, Philippines

Matters discussed during the meeting included:

Topic of Discussion	Lead Discussant
Presentation of Project Concept and General Plan	BB Dargantes
Updates on the Status of Research used as Basis for the Papers Submitted during the SEARCA 6th Executive Forum on Natural Resources Management	BB Dargantes
Sustainable Peat Development for Food Crop	Azwar Maas
Climate Change and its Impact on Indonesia's Food Crop Sector	Yuli Suharnoto
Water Resources Management Affecting Food Production in Bicol Region	Cheryl C. Batistel
Water and Food Security as Affected by Mining and Water Use Options	BB Dargantes
Issues and Concerns on Water Management for Food Production of Agricultural Education in Cambodia	Sopheap Ek
Detailed Planning for Project Implementation & Expected Project Outputs	BB Dargantes
APN and ViFARD Financial Regulations	Helina Ramos
Agreement on Project Team Milestones and Timelines	BB Dargantes
Presentation of Agreements and Plan of Activities	CC Batistel

Documentation and Mapping of Relevant Experiences and Good Practices

One major activity that was confirmed during the project planning meeting was the documentation of experiences and practices related to the incorporation of water and food security, and climate change issues into agriculture curricular programs, and into research and extension projects by the partner universities. With respect to research, documentation would initially focus on these experiences:

- Mapping of peatlands in view of their impact and potential influence on global climate;
- Mapping of localized climate variables especially on the
  - ✓ Characterization of climatic conditions of various ecosystem domains using the draft template being developed by UGM
  - ✓ Inclusion of the concept of Clean Development Mechanism in the characterization of the ecosystem domains
  - ✓ Application of the Hydrology Model in the analysis of
    - Watersheds as Planning Domain Units
    - Climate variability and
    - Crop Yield Variability

Another area of concern involved capability-building activities to support the mainstreaming of Climate Change Adaptation and Mitigation Initiatives in Agriculture. Of particular interest was on policy making at the national level especially on linking scientists and politicians. This would include:

- Improving the capabilities of scientists and professors for more effective policy formulation
- Improving the awareness of policy makers to the scientific basis of climate change adaptation and mitigation, and of the food and water security dimensions of climate variation

With respect to university instruction, the documentation exercise would delve into experiences in raising student awareness of policies, and of policy analysis and development in relation to food and water security, and climate change and variability. Programs on land and water management, which might be mainly targeted, but not limited, to agriculture students would also be looked into. Another area of interest was the accreditation of agriculture practitioners and programs in the various countries of ASEAN.

Inter-University Sharing of Relevant Experiences and Good Practices

The meeting for the initial sharing of relevant experiences and good practices was held on 2-6 February 2014 in Siem Reap, Cambodia. The meeting envisioned to provide university-based scientific personnel opportunities to share localized research results and adaptation activities, to identify possible trans-boundary initiatives, and to develop partnerships and collaborative projects in teaching, research and community outreach that could transcend national boundaries. More specifically, it aimed to:

1. Discuss the technical content of the various country papers for possible publication in the APN Science Bulletin;
2. Come up with an initial consolidation of documented relevant experiences and good practices, and initial write-up of the proposed technical papers for publication in the APN Science Bulletin; and,
3. Initially discuss the RDE proposals that were identified during the First Inter-University Meeting.

The meeting was attended by:

Name	Position and Affiliation	Address
Prof. Dr. Azwar Maas	Head, Center for Land Resurces Study, Faculty of Agriculture, UGM	Bulaksumur, Yogyakarta, Indonesia
Dr. Benito Heru Purwanto	Assistant Professor, Department of Soil Science, Faculty of Agriculture, UGM	Bulaksumur, Yogyakarta, Indonesia
Dr. Ir. Yuli Suharnoto	Researcher, Center for Climate Risk and Opportunity Management Southeast Asia and Pacific, IPB	Bogor, Indonesia
Mr. Arif Wibowo, M.Sc.	Head, Division for Climate Change Vulnerability, Assistant Deputy for Climate Change Adaptation, Ministry of Environment	4th Floor, Building B, Jl. D.I. Panjaitan Kau 24, Kebon Nanas, Jakarta, Indonesia
Mr. Sopheap Ek	Vice Dean, Faculty of Agricultural Technology and Management, RUA	Pnom Penh, Cambodia
Dr. Thavrak Huon	Dean, Graduate School, RUA	Pnom Penh, Cambodia
Mr. Visoth Ly	Ministry of Agriculture	Pnom Penh, Cambodia
Mr. Don Immanuel A. Edralin	Graduate Research Assistant, North Carolina A&T State University	Siem Reap, Cambodia
Prof. Dr. Buenaventura Dargantes	Institute for Strategic Research and Development Studies, College of Management and Economics, VSU	Baybay City, Leyte, Philippines
Ms. Cheryl C. Batistel	Department of Biological Sciences, College of Arts and Sciences, VSU	Baybay City, Leyte, Philippines

Ms. Litlen P. Dapar	Institute for Strategic Research and Development Studies, College of Management and Economics, VSU	Baybay City, Leyte, Philippines
Ms. Florencia G. Valenzona	Finance Officer, Visca Foundation for Agriculture and Rural Development, Inc. (ViFARD)	Baybay City, Leyte, Philippines

Activities undertaken during the meeting included:

1. Presentation of Project Updates and Discussion of the Proposed Technical Papers for Publication in the APN Science Bulletin particularly Peatlands Utilization for Food Production in Indonesia, Lessons Learned from Citarum, Indonesia in relation to Climate Change for IWRM, Issues and Concerns for Agricultural Education and Water Management for Food Production in Cambodia, Food and Water Security as Affected by Mining and Water Use Options in the Philippines, and Water Resource Management Affecting Food Production in Bicol, Philippines
2. Team Consolidation and Write-up of the Proposed Technical Papers for Publication in the APN Science Bulletin
3. Discussion of RDE Proposals as Initially Agreed during the First Inter-University Meeting especially pertaining to Mapping and Characterization of Peatlands for Sustainable Food Production in selected Countries of Southeast Asia, Mapping and Characterization of Southeast Asian Climate using the Hydrology Model with Watersheds as the Domain Units, and Linking Scientists and Professors with Policy-Makers to Strengthen the Mainstreaming of Climate Change Adaptation and Mitigation Initiatives in Agriculture
4. Planning for the Conduct of the Conference on Strengthening University Programs to Enhance Water and Food Security in a Changing Climate

Conference on Strengthening University Programs to Enhance Water and Food Security in a Changing Climate, and Preparation and Dissemination Project Outputs

With water and food security in the ASEAN being increasingly affected by changing climate patterns whose impacts (e.g. flooding, landslide, and drought) were being felt directly by farmers, natural and social scientists from the Philippines, Indonesia and Cambodia came to a consensus that strong collaboration and partnership with policy makers in the use of scientific knowledge and technology in conjunction with local and indigenous knowledge would result in a broader understanding of the water and food security dimensions of climate change. Such partnership could translate into research and extension agenda and programs to develop climate-resilient water resource management and food production systems, and integrated science-based risk assessments, and interdisciplinary and intersectoral approaches. Moreover, these could lead to the development of learning modules that would incorporate topics on climate impacts on food production and water management, and into a synergy of efforts for wider dissemination of good practices.

The conference, which was conceptualized in line with the scientific capacity development, awareness raising and dissemination of information pertaining to climate variability and climate change, agro-ecosystems and land use management, resource utilization and sustainable development options being espoused by the APN, was envisioned to provide a platform for an interface between policymakers and scientists into understanding global change, and into undertaking common action. More specifically, it aimed to:

1. Improve the effectiveness of scientists and professors in contributing to the formulation of relevant policies for mainstreaming climate change adaptation and mitigation initiatives in agriculture;

2. Improve the awareness of policy-makers to the scientific basis of climate change adaptation and mitigation initiatives, and their implications to food and water security; and
3. Increase student awareness to relevant policies, and improve student capability in policy analysis and development for mainstreaming climate change adaptation and mitigation initiatives in agriculture

The conference was divided into three sessions, namely:

Session 1: Adaptation and Mitigation Initiatives to Ensure Food and Water Security in a Changing Climate
Session 2: Water Resource Management and Water Service Delivery in the Face of a Changing Climate
Session 3: Governance and Institutional Development to Ensure Food and Water Security in a Changing Climate

The conference program was uploaded into the ISRDS webpage, and made accessible through:

http://www.vsu.edu.ph/images/isrds/CBA2013/APN-Conference-Program.pdf

3.0 Results & Discussion

Improvement of Agriculture Curricula

The project intended to enrich traditional agriculture curricula, and to allow students and graduates to improve their competency in dealing with changes in the way agriculture is being implemented worldwide. One of the proposals lined up for possible inclusion in a Philippine BSc in Agriculture curriculum was for the adoption of the course on Agro-Ecosystem Management. In VSU, this course has been offered to students pursuing BSc degrees in Biology major in Ecology and in Environmental Management, but has not been required for BSc in Agriculture students.

As offered, the course delved into the management of agricultural systems for sustainable crop and livestock production. More specifically, it aimed to:

1. Understand the basic theories and concepts in food production systems, from plant and animal domestication, to shifting cultivation and subsistence farming and fishing, to permanent agriculture.
2. Understand the structural and functional characteristics of agro-ecosystems, and identify relevant factors impinging on agricultural production systems, and their effects on system sustainability.
3. Increase appreciation of the principles and practices of sustainable agriculture and rural development (SARD).

Content-wise, the course covered such topics as:

1. Components of ecosystems particularly climate, water, soil, and flora and fauna
2. Concepts of agroecosystems which include types and components of agricultural and food production systems, energy utilization in agricultural and food production systems, and plant and animal interactions in agricultural and food production systems
3. Human and societal models for establishing agro-ecosystems and food production systems including the development of hunting and gathering systems, and plant and animal domestication, and the Ruthenberg Model, Koch Model, and Bayliss-Smith Model
4. Concepts of Sustainable Natural Resources Management with applications to agroecosystems and food production systems, and to Sustainable Agriculture and Rural Development (SARD)

Another proposal involved the introduction of the course on Advances in Soil and Water Conservation and Management to Address Climate Change. This course intended to:

1. Update students on recent advances in research related to the measurement, modelling and prediction of soil erosion/landslide;
2. Understand the concept of climate change and determine the impact of climate change on soil and water resources;
3. Describe the land degradation processes in relation to climate change;
4. Describe and quantitatively predict the movement of soil and rock materials during erosion and landslides in a landscape across time and space; and,
5. Develop awareness, and formulate strategies for sustained use of soil and water resources with special consideration on climate change issues.

It has been envisioned to delve into such topics as land and water resources, climate, climate change and impacts, infiltration, runoff/stream flow, evapotranspiration, soil erosion, soil transport and sedimentation, landslides, mechanical conservation structures and planning for soil and water conservation projects with special consideration on climate change impacts.

Data Management and Data Sharing

In the course of project implementation, data and information related to global environmental change (GEC) science, including climate change, as these relate to local agriculture and natural resources conditions, as well as science-based measures and community-based climate risk management strategies that build resilience in agriculture and water resource systems provided linkage between global scenarios and local situations. This was particularly demonstrated during the onslaught of Typhoon Haiyan in the Philippines wherein the impacts of such an extreme climate event on food and water supplies, availability and access were documented and formed part of the compilation of case studies and papers for possible publication. See for example the presentations of Dapar (2014), Reposar (2014), Mayo-Anda (2014), and Avila (2014).

Pursuant to the data sharing policy of APN, as well as consensus among university partners, research papers, curriculum materials, learning modules and other reports that would come out of the project would be made available to APN, to the collaborating institutions, and to national and regional policymaking bodies for their information, evaluation and possible adoption. Submission to the APN would conform of standard templates, while dissemination to other users would be in directly accessible formats, either digital or analogue, depending on the level of technology available to the user.

Publication and Dissemination

The compilation of relevant experiences and good practices was initially planned for publication in book form and/or posted in the VSU website. On the other hand, the materials presented during the conference had been printed as a compendium to serve as reference for the participants when they returned to their respective universities and/or institutions.

After the conference, however, the project partners discussed the options of having the technical papers submitted for possible publication in peer-reviewed journals—especially the APN Science Bulletin, and the Annals of Tropical Research (ATR). Submission to the APN Science Bulletin would be undertaken for papers that could be edited by the project secretariat to conform to the requirements of the publication.

Submission to the ATR would be explored as an alternative to the publication of a book. This option would allow the project secretariat to avail of the peer review mechanisms being practiced by ATR in

assessing the acceptability of the papers for publication. Moreover, it would mean wider dissemination of the information that would get into the publication—to include not only the project partners and conference participants, but also the official subscribers of ATR. This option also implies the possible non-inclusion of some papers into the journal, and the allocation of more funds for the actual printing.

Nonetheless, the following papers had been submitted to the project secretariat for possible submission either to the APN Science Bulletin or to the ATR, or for possible publication in book form:

1. A Glimpse of the RDE Program of the VSU Regional Climate Change Center by Eduardo O. Mangaoang (Corresponding Author)
2. Impacts of Typhoon Haiyan on Abaca Production and Their Implications on Livelihood Rehabilitation Initiatives by Litlen P. Dapar (Corresponding Author)
3. Evaluation System for Converted Peatlands in Relation to Fire Hazards and Government Policy by Azwar Maas (Corresponding Author)
4. Lessons Learned from Peatland Conversions in Aceh, Indonesia: Implications to Research and Development in Philippine Peatlands by Cheryl C. Batistel (Corresponding Author)
5. Formulation of Research and Development Agenda for Rural Water Systems: Challenges to Ensuring Resource Sustainability and Service Delivery by Buenaventura B. Dargantes (Corresponding Author)
6. Threats to Sustainable Water Supply as Affected by Land Use and Climate Change by Janet M. Modina (Corresponding Author)
7. Valuation of Watershed Services: Implications to Climate Change Mitigation and Adaptation by Novlloyd Celeste (Corresponding Author)
8. Impacts of Landslides on Food and Water Security in a Changing Climate: Field Experiences from Southern Leyte, Philippines by Beatriz Jadina (Corresponding Author)
9. SWAT Hydrology Model and Drought Anticipation by Yuli Suharnoto (Corresponding Author)
10. Watershed Assessment Using a Computerized Information Management System (SWIM) by Winston Tabada (Corresponding Author)
11. Role of Local Governments in Mainstreaming Climate Change Adaptation and Mitigation Initiatives: Reflections from Ground Zero of Typhoon Haiyan by Ronnan Christian M. Reposar (Corresponding Author)
12. Exploring Legal Remedies to Ensure the Rehabilitation of Affected Livelihood Systems: Post-Haiyan Experiences by Grizelda Mayo-Anda (Corresponding Author)
13. ISRDS Post-Haiyan Training Initiatives to Rehabilitate Livelihood Systems in Affected Communities by Myrna M. Avila (Corresponding Author)
14. Current Issues and Concerns Regarding Water Management for Food Production and Agricultural Education in Cambodia by Sopheap Ek (Corresponding Author)
15. Natural Resource Management and Rural Development Programs at the Royal University of Agricultural of Cambodia by Thavrak Huon (Corresponding Author)
16. The VSU-CA R&D Agenda for Food Security in the Context of Climate Change by Suzette B. Lina (Corresponding Author)
17. Developing a Course on Advances in Soil and Water Conservation and Management to Address Climate Change by Beatriz C. Jadina (Corresponding Author)

4.0 Conclusions

Prior to the implementation of this APN-funded project, the collaborating universities had been independently looking for ways to improve their respective curricular offerings and teaching materials, and conducting R&D activities related to climate change following their respective mandates of ensuring food and water security. Through this APN-funded project, these universities were able to share their respective instructional and R&D programs for inclusion into a possible ASEAN perspective in dealing with climate change impacts on agricultural—particularly food—production, and on the availability of water for productive and domestic purposes. Over the long term, the increased understanding of the water and food security dimensions of climate change in the Asia-Pacific region, plus a wider dissemination of good practices that the project initiated could translate into more focused setting of inter-university research and extension agenda and programs to develop climate-resilient water resources management and food production systems, as well as learning modules that deal with climate impacts on food production and water management. Project experience revealed that national government funding for university programs could be made coherent with the inter-university agenda. In other words, even after the project, the collaborating universities could continue their respective instructional and R&D programs—although this time within a broader framework. Of course, APN could continue to nurture the process to ensure that the regional inter-university agenda would get implemented by the participating universities within the national-level networks.

Earlier in the project, the proponents speculated that variations in in-country policies related to the formulation and revision of curricular programs, course content and learning modules could hinder the adoption of good practices that had been shared among project collaborators. Project experiences showed that certain aspects of these policies could be addressed by university-level amendments. Although some of these policies may require national-level reforms in-country recommendations could be designed to conform to the policy environment.

5.0 Future Directions

One of the points of consensus among project collaborators was that universities should strengthen their role of providing technical data and/or information to local leaders and officials undertaking community-based natural resource management interventions. The case examples compiled through the project could be discussed in development planning processes being undertaken by local governments and communities. The discussions would provide a mechanism whereby stakeholders could identify, review and/or define/redefine their respective roles, functions and organizational processes, and allow them to agree on institutional arrangements to improve the system of resource utilization and management, and incorporate non-formal education and capability building opportunities related to food and water security within the context of a changing climate.

These case examples could further be included as course contents of BSc and MSc programs specializing in resource utilization and management. They could provide professors and students with an initial conceptual and theoretical framework for course discussion. Follow-up fieldwork would then allow students to gain actual experiences, acquire factual evidence, and eventually enhance the level of appreciation of the activities being implemented.

Moreover, cross visits among and between affected communities, local governments, and members of academe should be encouraged to strengthen mechanisms for cross-disciplinary analyses. Results of sharing of experiences and theoretical discourse could serve as a counterbalance to the pre-dominance of some local developmental frameworks (e.g. the need to generate local revenues vis-à-vis the imperatives for “non-economic” resource conservation) without necessarily rejecting them,

while introducing alternative perspectives (e.g. resource generation potential of sustainable options) into the economic development planning framework.

Policymakers, especially those in local governments, need to thoroughly review their respective programs on water and food security, explore the applicability of various methodologies in the determination of alternative resource uses, and identify other compatible resource-use options. These methodologies, however, would be contingent upon a good analysis of resource use potentials which would be premised on the implementation of suitability and/or sustainability assessments. Any tentative knowledge on resource use potentials could serve as an initial basis for the valuation of resources, and could provide a starting point in the design of resource use optimization and/or productivity improvement programs.

Operationally, the conference participants, who envisioned a functional interface between policymakers and scientists to taking common action, signified their interest to continue conducting more intensive research on the mapping and characterization of peatlands in Indonesia, the Philippines and Cambodia—especially that inappropriately managed peatlands have the potential to significantly contribute to GHG emissions and to global climate change.

Researchers from participating universities also articulated their desire to come up with unified methodologies in the characterization of watersheds. These efforts could initially utilize the WIMS being developed at VSU, and later explore the integrative potential of WIMS and the SWAT Hydrology Model being refined at the IPB. Using the WIMS and the SWAT Hydrology Model as platform for an initial ASEAN-wide characterization of critical watersheds, the applicability of the land use evaluation systems being promoted by UGM could be tested further. These land use evaluation systems could then be popularized for use by students, local governments, workers of non-governmental organizations, and communities.

Lastly, work on the introduction of common courses in the agriculture curricula among ASEAN universities could be started as a mechanism for knowledge sharing. Of special interest among university partners was on increasing student awareness to relevant policies, and on improving student capability in policy analysis and development for mainstreaming climate change adaptation and mitigation initiatives in agriculture. Such initiatives for students could be made part of the cross visits among community leaders, policymakers and university professors and researchers.

References

Batistel, C. (2014) Lessons Learned from Peatland Conversions in Aceh, Indonesia: Implications to Research and Development in Philippine Peatlands. Paper presented during the Conference on Strengthening University Programs to Enhance Water and Food Security in a Changing Climate held on 13-15 August 2014 at VSU, Baybay City, Leyte, Philippines

Dargantes, B.B., M.B. Manahan, and C.C. Batistel. (2011) Treading Troubled Waters. Focus on the Global South. Quezon City, 60pp.

Dargantes, B.B., C.C. Batistel, and M.A.T.W. Tabada. (2011) Challenging National Development Agenda: What Policies Address Issues in the Visayas. Focus on the Global South. Quezon City, 38pp.

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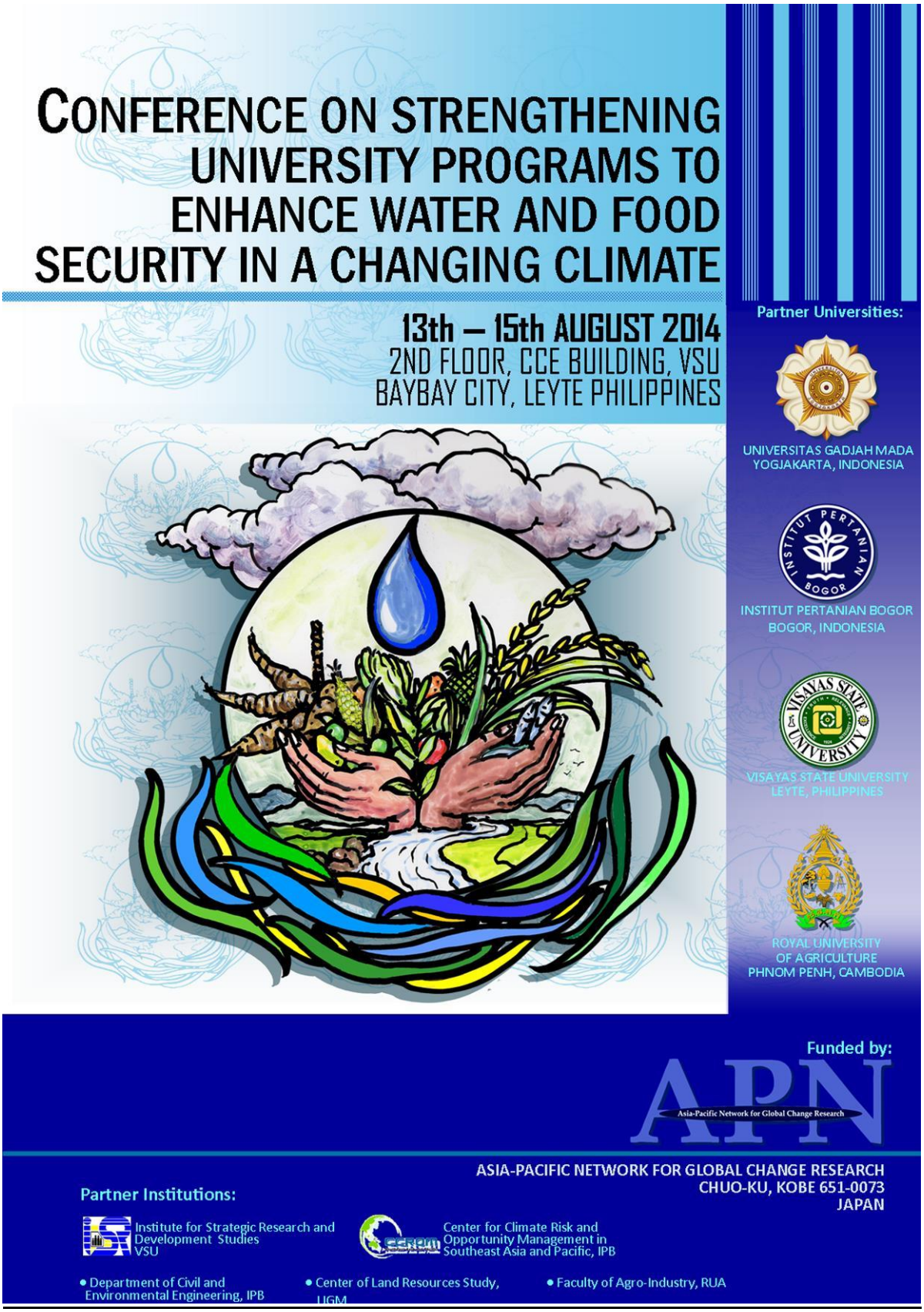
Kada, Ryohei. (2012) Ecology-Related Risks on Water, Food Safety and Security, and Health, Paper presented during the Sixth Executive Forum on Natural Resource Management: Water and Food in a Changing Environment held on 11-13 April 2012 at SEARCA, Los Baños, Laguna, Philippines

Maas, A. (2014). Evaluation System for Converted Peatlands in Relation to Five Hazards and Government Policy. Paper presented during the Conference on Strengthening University Programs to Enhance Water and Food Security in a Changing Climate held on 13-15 August 2014 at VSU, Baybay City, Leyte, Philippines

Appendix

Conferences/Symposia/Workshops



RATIONALE

Water and food security in the Asia-Pacific have increasingly been affected by changing climate patterns and food and health risks have worsened due impacts of changing climate (e.g. flooding, landslide, and drought) felt directly by farmers. Faced with these challenges, universities have to adapt their curricular programs, research and extension activities, and teaching modules to take into consideration the nature of climate change, and various dimensions of water and food security.

In the course of sharing localized research results, adaptation activities and trans-boundary initiatives, natural and social scientists from the Philippines, Indonesia and Cambodia came to consensus that strong collaboration and partnership with policy makers in the use of scientific knowledge and technology in conjunction with local and indigenous knowledge would result in a broader understanding of water and food security dimensions of climate change. Such partnership could translate into research and extension agenda and programs to develop climate-resilient water resource management and food production systems, and integrated science-based risk assessments, and interdisciplinary and intersectoral approaches. Moreover, these could lead to the development of learning modules that incorporate topics on climate impacts on food production and water management and in a synergy of efforts for wider dissemination of good practices.

This conference is in line with the scientific capacity development, awareness raising and dissemination of information pertaining to climate variability and climate change, agro-ecosystems and land use management, resource utilization and sustainable development options being espoused by APN. This activity provides a platform for an interface between policymakers and scientists into understanding global change, and into undertaking common action.

OBJECTIVES

- To improve the effectiveness of scientists and professors in contributing to the formulation of relevant policies for mainstreaming climate change adaptation and mitigation initiatives in agriculture
- To improve the awareness of policy-makers to the scientific basis of climate change adaptation and mitigation initiatives, and their implications to food and water security
- To increase student awareness to relevant policies, and improve student capability in policy analysis and development for mainstreaming climate change adaptation and mitigation initiatives in agriculture

PROGRAM OF ACTIVITIES

Date and Time	Activity	Person Involved
12 August 2014		
1:00PM	Arrival and Billeting of Participants (VSU Apartelle)	Ms. Leonarda A. Maurillo Ms. Johanna C. Casillano Ms. Eva Marie P. Oraiz
5:00PM	Opening Program (CCE Conference Room)	Dr. Myrna M. Avila
	♦ Welcome Prayer	Ms. JC Casillano
	♦ Philippine National Anthem	Ms. EMP Oraiz
	♦ Introduction of Participants	Ms. Cheryl C. Batistel
	♦ Overview of the Project and of the Conference	Dr. Buenaventura B. Dargantes
	♦ Introduction of the VSU President	Ms. Maria Aurora Teresita W. Tabada
	♦ Inspirational Message	Dr. Jose L. Bacusmo VSU President
7:00PM	Welcome Dinner (VSU Dining Hall)	Ms. CC Batistel Dr. Ana Asumpta N. Perez
	♦ Cultural Presentation	Mr. Joselle Cayetano & IHK Students

PROGRAM OF ACTIVITIES

Date and Time	Activity	Person Involved
13 August 2014		
8:00AM	Registration of Participants	Ms. Leonarda A. Maurillo Ms. Eva Marie P. Oraiz Ms. Merry Jean Caparas
	Session 1: **Adaptation and Mitigation Initiatives to Ensure Food and Water Security in a Changing Climate**	
8:30AM	Philippine Experiences in Mainstreaming Climate Change in Agriculture: Strategies, Problems and Issues	Prof. Dr. Eliseo R. Ponce
9:45AM	Coffee Break	
10:00AM	A Glimpse of the RDE Program of the VSU Regional Climate Change Center	Prof. Dr. Eduardo O. Mangaoang
10:30AM	Impacts of Typhoon Haiyan on Abaca Production and Their Implications on Livelihood Rehabilitation Initiatives	Ms. Litlen P. Dapar
11:00AM	Small Group Discussions on the Challenges to Mainstreaming of Climate Change in Agriculture	
11:45AM	Presentation of Outputs ♦ Challenges to Agricultural R&D ♦ Challenges to Agricultural Extension	
12:30NN	Lunch Break	
2:00PM	Evaluation System for Converted Peatlands in Relation to Fire Hazards and Government Policy	Prof. Dr. Azwar Maas
3:00PM	Lessons Learned from Peatland Conversion in Aceh, Indonesia: Implications to Research and Development in Philippine Peatlands	Ms. Cheryl C. Batistel
3:30PM	Water Conservation in Rice Production Systems	Dr. Benito Heru Purwanto
4:00PM	Coffee Break	
4:15PM	Small Group Discussions on the Challenges to Peatlands Development	
5:00PM	Presentation of Outputs ♦ Challenges to R&D in Peatlands and Swamplands ♦ Challenges to Agricultural Extension in Peatlands and Swamplands	
7:00PM	Dinner (VSU Dining Hall)	

PROGRAM OF ACTIVITIES

Date and Time	Activity	Person Involved
14 August 2014		
8:00AM	Recapitulation of Day 1 Activities	
	Session 2: **Water Resource Management and Water Service Delivery in the Face of a Changing Climate**	
8:30AM	Formulation of Research and Development Agenda for Rural Water Systems: Challenges to Ensuring Resource Sustainability and Service Delivery	Prof. Dr. BB Dargantes
9:00AM	Threats to Sustainable Water Supply as Affected by Land Use and Climate Change	Ms. Janet M. Modina
9:30AM	Valuation of Watershed Services: Implications to Climate Change Mitigation and Adaptation	Mr. Novlloyd Celeste
10:00AM	Impacts of Landslides on Food and Water Security in a Changing Climate: Field Experiences from Southern Leyte, Philippines	Dr. Beatriz C. Jadina
10:30AM	Coffee Break	
10:45AM	Surviving Nicua and Yolanda: Capacitating Development Workers for Resilience and Sustainability	Prof. MATW Tabada
11:15AM	Small Group Discussions on the Challenges to Ensuring Water Resources Sustainability and Water Service Delivery	
11:45AM	Presentation of Outputs ♦ Challenges to R&D in IWRM ♦ Challenges to Water Services Provision	
12:15NN	Lunch Break	
1:00PM	Campus Tour	Mr. Raul S. Abit
3:00PM	SWAT Hydrology Model and Drought Anticipation	Dr. Yuli Suharnoto
3:30PM	Watershed Assessment Using a Computerized Information Management System (SWIM)	Prof. Winston M. Tabada
4:00PM	Coffee Break	
4:15PM	Small Group Discussions on Technological Applications for IWRM	
5:00PM	Presentation of Outputs ♦ R&D for IWRM ♦ Capability building for IWRM	
7:00PM	Dinner (VSU Dining Hall)	

PROGRAM OF ACTIVITIES

Date and Time	Activity	Person Involved
15 August 2014		
8:00AM	Recapitulation of Day 2 Activities	
	Session 3: **Governance and Institutional Development to Ensure Food and Water Security in a Changing Climate**	
8:30AM	Role of Local Governments in Main streaming Climate Change Adaptation and Mitigation Initiatives: Reflections from Ground Zero of Typhoon Haiyan	Atty. Ronnan Christian M. Reposar
9:00AM	Exploring Legal Remedies to Ensure the Rehabilitation of Affected Livelihood Systems: Post-Haiyan Experiences	Atty. Grizelda Mayo-Anda
9:30AM	ISRDS Post-Haiyan Training Initiatives to Rehabilitate Livelihood Systems in Affected Communities	Prof. Dr. Myrna M. Avila
10:00AM	Coffee Break	
10:15AM	Current Issues and Concerns Regarding Water Management for Food Production and Agricultural Education in Cambodia	Mr. Sopheap Ek
10:45AM	Natural Resource Management and Rural Development Programs at the Royal University of Agriculture of Cambodia	Dr. Thavrak Huon
11:15AM	The VSU-CA R & D Agenda for Food Security in the Context of Climate Change	Dr. Suzette B. Lina
11:45AM	Developing a Course on Advances in Soil and Water Conservation and Management to Address Climate Change	Dr. Beatriz C. Jadina
12:15NN	Lunch Break	
1:30PM	Small Group Discussions on Food and Water Security in a Changing Climate	
2:30PM	Presentation of Outputs ♦ R&D Programs for ASEAN ♦ Capability building Programs ♦ Inter-University Collaboration	
3:30PM	Closing Program	
4:00PM	Homeward Bound	

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Activity: Conference on Strengthening University Programs to Enhance Water and Food Security in a Changing Climate

Date: August 13-15, 2014

Venue: 2/F Center for Continuing Education , VSU, City of Baybay, Leyte

No.	Surname	Given Name	M.I.	Position	Institution/Organization	University/Agency	City	Country
1	Avila	Myrna	M	Professor	ISRDS	Visayas State University	Baybay City, Leyte	Philippines
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5	Caseres	Jocelyn	D	Area Manager for the Visayas	Environmental Legal Assistance Center	ELAC	Cebu City	Philippines
6	Celeste	Novlloyd	E	Instructor	College of Engineering and Industrial Technology	Northwestern Samar State University	Calbayog City	Philippines
7	Dagami	Amelie	E	Lawyer	Court of Appeals	Supreme Court of the Philippines	Cebu City	Philippines
8	Dapar	Litlen	P	Graduate Student	ISRDS	Visayas State University	Baybay City, Leyte	Philippines
9	Dargantes	Buenaventura	B	Professor	ISRDS	Visayas State University	Baybay City, Leyte	Philippines
10	Ek	Sopheap		Vice Dean	Agro-Industry	Royal University of Agriculture	Phnom Penh	Cambodia
11	Honculada	Jurgette	A	Trustee	Philippine NGO Council for Sustainable Agriculture		Butuan City	Philippines
12	Huon	Thavrak		Dean	Graduate School	Royal University of Agriculture	Phnom Penh	Cambodia

13	Jadina	Beatriz	C	Associate Professor	Department of Agronomy and Soil Sciences	Visayas State University	Baybay City, Leyte	Philippines
14	Legada	Guillermo	L	Director	Office of the Director for Research	Capiz State University	Roxas City, Capiz	Philippines
15	Lina	Suzette	B	Instructor	Department of Agronomy and Soil Sciences	Visayas State University	Baybay City, Leyte	Philippines
16	Linan	Efren		Director	Intellectual Property Rights Office	Capiz State University	Roxas City, Capiz	Philippines
17	Maas	Azwar		Director	Center for Land Resources Study	Universitas Gadjah Mada	Yogyakarta	Indonesia
18	Mangaoang	Eduardo	O	Director	Regional Climate Change Center	Visayas State University	Baybay City, Leyte	Philippines
19	Mayo- Anda	Grizelda	M	Executive Director	Environmental Legal Assistance Center	ELAC	Puerto Princesa, Palawan	Philippines
20	Modina	Janet	M	Graduate Student	ISRDS	Visayas State University	Baybay City, Leyte	Philippines
21	Omillo	Adan	C	Area Manager	Kaakbay sa Buhay at Negosyo Micro-credit Incorporated	KMI	Tacloban City	Philippines
22	Perez	Ana Asumpta	N	Instructor	College of Nursing	Visayas State University	Baybay City, Leyte	Philippines
23	Ponce	Eliseo	R	Consultant	System-Wide Climate Change Office	Philippine Department of Agriculture	Quezon City	Philippines
24	Ravas	Dennis	M	BOD Member	Kaakbay sa Buhay at Negosyo Micro-credit Incorporated	KMI	Tacloban City	Philippines
25	Reposar	Ronnan Christian	M	Vice Mayor	Sangguniang Bayan ng Palo	Palo Local Government Unit	Palo, Leyte	Philippines
26	Solante	Ramses		Dean	College of Agriculture	Capiz State University	Roxas City, Capiz	Philippines
27	Suharnoto	Yuli		Researcher	Center For Climate Risk and Opportunity Management for Asia and the Pacific	Institut Pertinian Bogor	Bogor	Indonesia
28	Tabada	Winston	M	Head	Department of Computer Science	Visayas State University	Baybay City, Leyte	Philippines
29	Tabada	Maria Aurora Teresita	W	Director	ISRDS	Visayas State University	Baybay City, Leyte	Philippines
30	Bolledo	Ariel	B.	Instructor	Agriculture Department	Capiz State University	Roxas City, Capiz	Philippines
31	Cabelin	Jorge	P.	Graduate Student	Department of Agronomy and Soil Sciences	Visayas State University	Baybay City, Leyte	Philippines
32	Rosales	Gladys	B.	Science Research Assistant	National Coconut Research Center	Visayas State University	Baybay City, Leyte	Philippines
33	Evangelio	Julissah	C	Instructor	Department of Biological Sciences	Visayas State University	Baybay City, Leyte	Philippines

34	Olguera	Dernie	T	Graduate Student	Department of Agronomy and Soil Sciences	Visayas State University	Baybay City, Leyte	Philippines
35	Villasica	Leo Jude	D	Graduate Student	Department of Agronomy and Soil Sciences	Visayas State University	Baybay City, Leyte	Philippines
36	Castañas	Elena	L	Assistant Professor		Eastern Visayas State University	Tacloban City	Philippines
37	Pasa	Arturo	E	Professor	Department of Forestry	Visayas State University	Baybay City, Leyte	Philippines
38	Lumacad	Aniceta	M.	Laboratory Technician II	Department of Agronomy and Soil Sciences	Visayas State University	Baybay City, Leyte	Philippines
39	Saga	Meriza	M	Graduate Student	Department of Agronomy and Soil Sciences	Visayas State University	Baybay City, Leyte	Philippines
40	Flandez	Art Russel	R	Instructor	Dept of Biological Science	Visayas State University	Baybay City, Leyte	Philippines
41	Abulencia	Miguel Francisco	B	Bsc. Student	Department of Agronomy and Soil Sciences	Visayas State University	Baybay City, Leyte	Philippines
42	Sabijon	Jessie	R	Bsc. Student	Department of Agronomy and Soil Sciences	Visayas State University	Baybay City, Leyte	Philippines
43	Bulayog	Ernesto	F	Professor	Department of Economics	Visayas State University	Baybay City, Leyte	Philippines
44	Andrade	Zenaida	L	Assistant Professor	Department of Chemistry	Eastern Visayas State University	Tacloban City	Philippines
45	Belonias	Ted Dominique	S	Instructor	Department of Biological Sciences	Visayas State University	Baybay City, Leyte	Philippines
46	Rueda	Marivel	N	Volunteer	Kaakbay sa Buhay at Negosyo Micro-credit Incorporated	KMI	Carigara, Leyte	Philippines
47	Briva	Abbie	A	Volunteer	Kaakbay sa Buhay at Negosyo Micro-credit Incorporated	KMI	Tacloban City	Philippines
48	Ruedas	Eunice	O	Volunteer	Kaakbay sa Buhay at Negosyo Micro-credit Incorporated	KMI	Tacloban City	Philippines
49	Villamayor	Faustino	M	Professor	Department of Agronomy and Soil Sciences	Visayas State University	Baybay City, Leyte	Philippines

List of Agencies, Institutions and Organisations that Provided In-kind Support

Name of Agency, Institution or Organisation	Type of Support	Estimated Amount (USD)
Visayas State University	University Personnel	24,000
	Office space and utilities	3,200
	Equipment	1,500
Universitas Gadjah Mada	University Personnel	2,400
Institut Pertanian Bogor	University Personnel	2,400
Royal University of Agriculture	University Personnel	4,800
Capiz State University	Transportation and Incidental Expenses	1,000
Eastern Visayas State University	Transportation and Incidental Expenses	600
Northwest Samar State University	Transportation and Incidental Expenses	300
Camarines Norte State College	Transportation and Incidental Expenses	600
Environmental Legal Assistance Centre	Transportation and Incidental Expenses	600
Philippine NGO Council for Food Security	Transportation and Incidental Expenses	600
Kabuhayan Micro-Credit, Inc.	Transportation and Incidental Expenses	600
	Total	42,600

List of Young Scientists

Short Messages from Young Scientists

The Conference helped build the capacity of participants to address problems and knowledge gaps about water and food security. This may drive them to improve and develop their locality or country. I also gained more knowledge about the situation of other countries regarding to water and food security, which I can use to compare and to improve my own country's welfare. Also, new practices and methods regarding food and water security were introduced during the conference.
Ted Dominique S. Belonias, Instructor, Department of Biological Sciences, Visayas State University

The conference provided important information on the current and on-going issues related to food and water security in a changing climate. I have become well-informed on things that I was not previously aware of.
Julissah C. Evangelio, Instructor, Department of Biological Sciences, Visayas State University

The conference provided me insights on climate change in relation to university programs. The discussions pointed out the need to mainstream climate change in the university and to embrace it to help contribute in mitigation and adaptation. In my point of view, there is a gap between research and implementation of programs. As one presenter expounded, "The academe, especially researchers, should put closure to the redundancy and recycling of programs, and instead focus on the implementation of these programs for the betterment of the beneficiaries."

Another thing that caught my attention was the effects of climate change on land use and water supply. Noticeably, there are many landslides and earthquakes, floods, storm surge and typhoon.

But for whatever reason why these happened, I believed these are due to human activities. I look forward to academic institutions and scientists, who have the capacity and knowledge to generate data for climate change mitigation and adaptation, to make this world a better place to live in without compromising indigenous knowledge to scientific knowledge.

Novlloyd Celeste, Instructor, College of Engineering, Northwest Samar State University

List of Young Scientists

Strengthening the Capability of Colleges of Agriculture in Incorporating Food and Water Security and Climate Change and Climate Variability into Curricular Programs, Research and Extension Projects and Teaching Modules

No.	Surname	Given Name	M.I.	Position	Institution/Organization	University/Agency	City	Country
1	Batistel	Cheryl	C	Instructor	Department of Biological Sciences	Visayas State University	Baybay City, Leyte	Philippines
2	Carbonell	Michelle	S	Director	Research Office	Camarines Norte State College	Daet, Camarines Norte	Philippines
3	Caseres	Jocelyn	D	Area Manager for the Visayas	Environmental Legal Assistance Center	ELAC	Cebu City	Philippines
4	Celeste	Novlloyd	E	Instructor	College of Engineering and Industrial Technology	Northwestern Samar State University	Calbayog City	Philippines
5	Dapar	Litlen	P	Graduate Student	ISRDS	Visayas State University	Baybay City, Leyte	Philippines
6	Huon	Thavrak		Dean	Graduate School	Royal University of Agriculture	Phnom Penh	Cambodia
7	Reposar	Ronnan Christian	M	Vice Mayor	Sangguniang Bayan ng Palo	Palo Local Government Unit	Palo, Leyte	Philippines
8	Bolledo	Ariel	B.	Faculty	Agriculture Department	Capiz State University	Roxas City, Capiz	Philippines
9	Cabelin	Jorge	P.	Graduate Student	Department of Agronomy and Soil Sciences	Visayas State University	Baybay City, Leyte	Philippines
10	Rosales	Gladys	B.	Science Research Assistant	National Coconut Research Center	Visayas State University	Baybay City, Leyte	Philippines
11	Evangelio	Julissah	C	Instructor	Department of Biological Sciences	Visayas State University	Baybay City, Leyte	Philippines
12	Olguera	Demie	T	Graduate Student	Department of Agronomy and Soil Sciences	Visayas State University	Baybay City, Leyte	Philippines
13	Villasica	Leo Jude	D	Graduate Student	Department of Agronomy and Soil Sciences	Visayas State University	Baybay City, Leyte	Philippines
14	Saga	Meriza	M	Graduate Student	Department of Agronomy and Soil Sciences	Visayas State University	Baybay City, Leyte	Philippines

15	Flandez	Art Russel	R	Instructor	Department of Biological Sciences	Visayas State University	Baybay City, Leyte	Philippines
16	Abulencia	Miguel Francisco	B	BSc. Student	Department of Agronomy and Soil Sciences	Visayas State University	Baybay City, Leyte	Philippines
17	Sabijon	Jessie	R	BSc. Student	Department of Agronomy and Soil Sciences	Visayas State University	Baybay City, Leyte	Philippines
18	Belonias	Ted Dominique	S	Instructor	Department of Biological Sciences	Visayas State University	Baybay City, Leyte	Philippines
19	Rueda	Marivel	N	Volunteer	Kaakbay sa Buhay at Negosyo Micro-credit Incorporated	KMI	Carigara, Leyte	Philippines
20	Briva	Abbie	A	Volunteer	Kaakbay sa Buhay at Negosyo Micro-credit Incorporated	KMI	Tacloban City	Philippines
21	Ruedas	Eunice	O	Volunteer	Kaakbay sa Buhay at Negosyo Micro-credit Incorporated	KMI	Tacloban City	Philippines
22	Nurudin	Makruf		Instructor	Department of Soil Science	Universitas Gadjah Mada	Yogyakarta	Indonesia
23	Ly	Visoth				Ministry of Agriculture	Phnom Phen	Cambodia
24	Edralin	Don Immanuel	A	Graduate Research Assistant		North Carolina Agriculture and Technical State University	Siem Reap	Cambodia

Glossary of Terms

ATR	Annals of Tropical Research
APN	Asia-Pacific Network for Global Change Research
ASEAN	Association of Southeast Asian Nations
CCROM-AP	Centre for Climate Risk and Opportunity Management in Asia and the Pacific
CME	College of Management and Economics
CO_2	Carbon Dioxide
ENSO	El Niño Southern Oscillation
GHG	Greenhouse Gas
GDP	Gross Domestic Product
LRSC	Land Resources Study Centre
ISRDS	Institute for Strategic Research and Development Studies
IPB	Institut Pertanian Bogor
LRSC	Land Resources Study Centre
R&E	Research and Extension
RDE	Research, Development and Extension
RUA	Royal University of Agriculture
SARD	Sustainable Agriculture and Rural Development
SEARCA	Southeast Asian Regional Centre for Graduate Study and Research in Agriculture
UGM	Universitas Gadjah Mada
VSU	Visayas State University
ViFARD	Visca Foundation for Agricultural and Rural Development, Inc.
WIMS	Watershed Information Management Systems