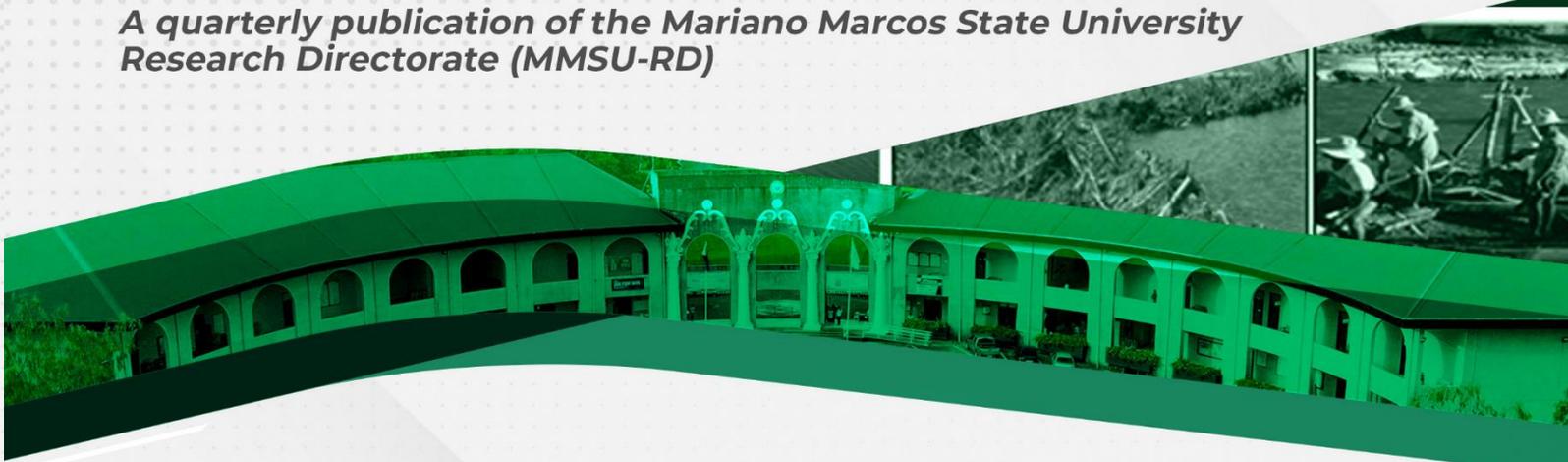




POLICY BRIEF SERIES

*A quarterly publication of the Mariano Marcos State University
Research Directorate (MMSU-RD)*

A background image showing a large, curved university building with a green roof and a rice field in the foreground. The image is partially obscured by a green overlay.

CLIMATE CHANGE ADAPTATION STRATEGIES FOR A RESILIENT RICE-BASED PRODUCTION SYSTEM IN ILOCOS NORTE

Criselda M. Balisacan, Constante B. Julian,
Susan G. Aquino, and Erle Stanley G. Damaso

EXECUTIVE SUMMARY

Climate change adaptation (CCA) is a key priority of the Philippine government reflected in the number of policies, and adaptation programs and activities crafted to combat the extreme impacts of climate change. Many government agencies and non-government organizations put intense efforts for more effective and efficient CCA through institutional, organizational, and human-capacity strengthening.

Along this, the Mariano Marcos State University documented and examined the adaptation strategies of rice farmers, zanjeras, and local government units (LGUs) in Ilocos Norte. The intention is to emphasize the significance of location and context-specific CCA strategies for rice-based production which is the major livelihood of rural households in the province.

The impacts of the climatic change on rice-based production were significantly felt by the farming households and communities in the province. How they adapted to the changing conditions were influenced by their observations and experiences. The changes in temperature, rainfall pattern, frequency of occurrence, distribution and intensity, and extreme typhoons reckoned five years back were the important farmers' indicators of climate change. Results showed that the farmers' observations were consistent with the science-based trend analysis of PAGASA meteorological stations in the province and other related reports. Identified as the major impacts of the changing climate included the unpredictability of the onset of rain, the flooding and sedimentation of the Padsan River Basin (PRB) that resulted to crop failure and huge rice production loss. These experiences led them to adopt strategies such as adjusting cropping calendar and using appropriate rice cultivars. In order to cope with the occurrence of dry spell during the wet season cropping and scarcity of irrigation water, Zanjera farmers constructed diversion dams called "arbeng" made of brush, woods, and like materials. Although temporary in nature, this is their only resort of sustaining the irrigation requirement of rice production in their area.

The LGUs CCA programs and strategies were in the form of rice seed loan assistance, hazard mapping, and dam repair and rehabilitation of irrigation and flood control structures. Identified as important considerations in the planning, designing and implementation of CCA programs included *financial stability, acceptability of the program, participation of target beneficiaries, sustainability of the program economic or technical feasibility, political, social and cultural constraints.*

INTRODUCTION

Rice, is the staple food and most valuable crop of Filipinos. For many families especially those in the rural areas, the rice industry is the main source of livelihood. This is why a large number of farming households plant rice as top priority crop. However, the rice production systems (RPS) in the country have become increasingly threatened by the effects of climate change (CC) as a huge portion of the rice-growing areas are located in vulnerable areas. For instance, the impacts of typhoon "Lando" (2015), "Karen" and "Lawin" (2016) had been damaging as evidenced by the rice production losses of 4.31 and 2.88 percent in 2015 and 2016, respectively, from production gains of 2.87 percent in 2014 (Selected Statistics on Agriculture, 2015, 2016 and 2017). These are the challenging realities faced by the ordinary rice farming households that the Philippine government have to address and provide immediate solutions.

The province of Ilocos Norte, although recorded as one of the top rice producing provinces in the country, is not exempted from the threatening effects of climate change. The farming communities face pressures to adjust agricultural systems especially rice-based production to make them more resilient in the face of increasingly changing climate and variable weather. Additionally, these challenging realities that have to be addressed and to be provided immediate and appropriate solutions at the farmer, local government and institution levels need to be extensively studied to provide bases on how to sustain the livelihoods of the ordinary rice farming households. However, there has been no reports or studies conducted on the adaptation strategies to make rice farming systems adaptive and resilient in the face of changing climate.

This documentation and assessment conducted by MMSU focused on location- and context-specific CCA strategies on rice-based production. It attempts to forward recommendations that aim to

incorporate the farmers' observations and adaptation strategies in aid of local planning, programming, and policy making for a resilient rice-based production system in Ilocos Norte.

APPROACHES AND RESULTS

The documentation and analysis of the farmers' knowledge, observations, and experiences on the impacts of CC on rice production was conducted in two phases. In the first phase, done in 2013, primary data and information were collected from 106 randomly selected rice farming households in Nueva Era, Banna, Marcos, Dingras, Sarrat, Solsona and Laoag City. The second phase was conducted in 2015, wherein 24 implementers, Municipal/City Agriculture Officer, Agricultural Technicians, Planning and Coordinating Officer, Budget Officer, Municipal Engineer from Marcos, Dingras, Bacarra, Pasuquin and Vintar who were directly involved in the implementation of the CC adaptation program were also data sources. The other LGUs in the province were then still at the establishment of their respective CCA strategies. Focus group discussions (FGDs) and key informants interview (KIs) were the employed to verify and validate the gathered data. Additionally, secondary data from various sources were resorted to. A case study of two zanjeras in Solsona was conducted as part of this research initiative.

Farmers' CC indicators were the changes in temperature, rainfall pattern, frequency of occurrence, distribution and intensity, and extreme typhoons. This local knowledge and observations were found consistent with the science-based trend analysis of meteorological stations in the province and other related reports (Galacgac et al., 2012, 2013). The impacts of the climatic changes and variability that resulted to crop failure and great huge rice production loss included the unpredictability of the onset of rain, the flooding and sedimentation of the PRB, and the main source of farmers' irrigation system.

These observations and experiences served as their bases in adjusting their cropping calendar and in selecting appropriate rice cultivars. On the other hand, zanjera farmers constructed diversion dams called "arbeng" (Figure 1) to cope with the occurrence of dry spells during the wet season cropping and scarcity of irrigation water during the dry season. Although temporary in nature, this is their only way to sustain the irrigation requirement of rice production in the area.



Fig. 1. Zanjera farmer-members construct diversion dams or "arbeng" made of brush, woods, and like materials.

On the other hand, the LGUs crafted their respective CCA programs and strategies that can best address and effectively assist rice farming communities in reducing the impacts of CC to rice-based production (Figure 2a). Among these were the seed dispersal of drought/lodging-resistant rice varieties with demonstration farms, hazard mapping, rehabilitation of dams, construction of river flood controls

structures, and communal irrigation system. Local knowledge, expertise, and institutional capacity were found to be important considerations for successful planning and design of CCA programs. As to the program process, identification of target beneficiaries either as individual farmer or group/association, needs assessment, implementation, monitoring and evaluation (Figure 2b) surfaced as significant factors contributory to an effective and efficient CCA programs. Alongside with these are: timeliness, relevance, responsiveness, adequacy, accessibility and complementation (Figure 2c) in the delivery and implementation of CCA programs.

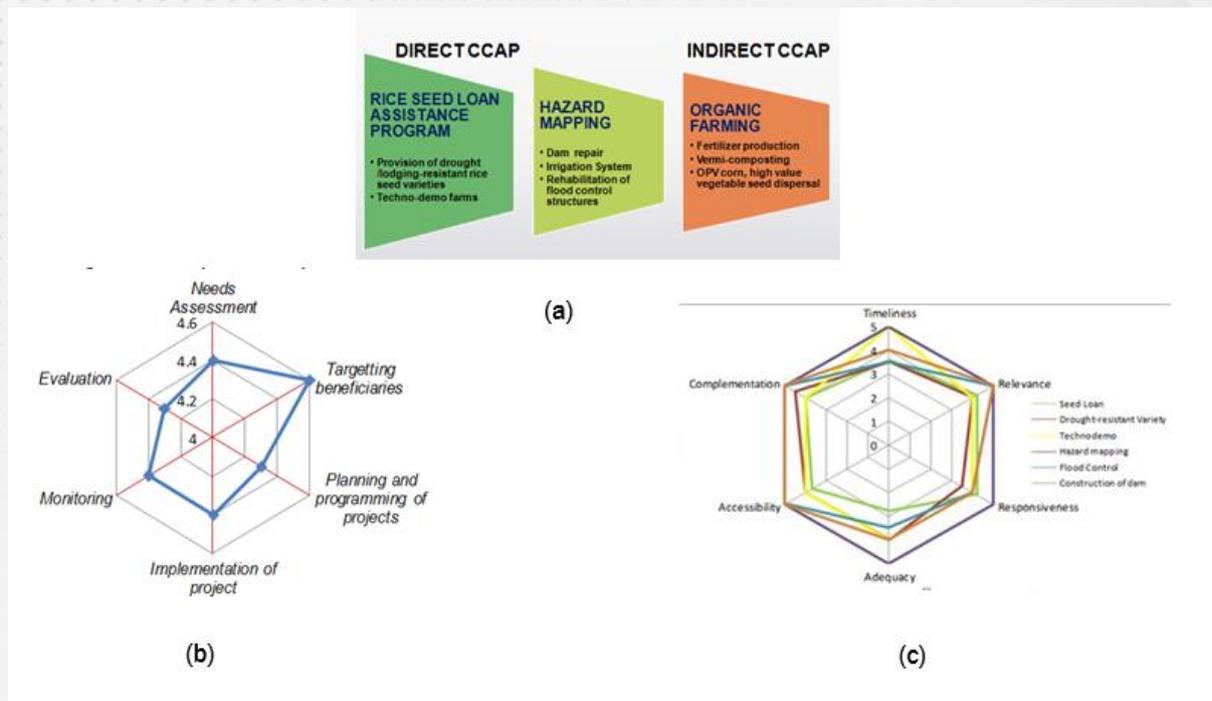


Fig. 2. The CCA (a) processes, (b) delivery and implementation, (c) of the program/activities by the LGUs.

CONCLUSIONS

1. Experienced rice farmers consciously observed changes in temperature and rainfall, typhoon, flood and drought occurrences based on their recollection of the past five (5) years of climate events. Their reported observations were almost consistent with the climatic data and records of the two PAGASA meteorological stations in Ilocos Norte and previous research findings. These served as their bases to adjust their cropping calendar, use of short-duration crop cultivars, and other adaptation strategies in response to CC impacts.
2. Zanjera farmers were able to produce and harvest from their rice production activity despite water scarcity and the threats of typhoons and, floods. This is the result of their well-managed traditional irrigation system particularly the “brush dam” or “arbeng” and the members’ collective action.
3. Successful CCA programs of the LGUs required local knowledge, expertise, and institutional capacity. The programs were extended to the right beneficiaries and, farmers/zanjerars, using criteria on *poverty level and risk of drought or extreme climate change* which gained a high rating.

IMPLICATIONS/RECOMMENDATIONS

- Rice farmers' perceptions on climate change/variability are based on their personal observation and experiences on the rainfall, temperature, and typhoon/flood events. Most farmers indicated that the rainy season influence their planting calendar, which used to begin in April or May but has shifted to June. Also, temperature conditions are observed on increasing trend, as evidenced by drying up of the PRB and scarcity of irrigation water.
- Their perceptions, with respect to changes in temperature, increasing rainfall, and typhoon variability, are close to empirical trend analysis of meteorological stations of PAGASA in the cities of Laoag and Batac. This indicates that Ilocos rice farmers are knowledgeable of about CC and they have sufficient evidences of its impacts on their rice-based livelihood particularly on rice production.
- Farmers' observations, experiences, and local knowledge in coping with and adapting to CC impacts could be harnessed as bases for rice-based production resiliency in Ilocos Norte. These could, likewise, be considered by policymakers as bases in crafting policies for adaptation practices and rice-based production systems, as well as coping mechanisms to enhance or supplement other current practices.
- Farmers' association officials like the zanjeras should be involved in the formulation of local CCA programs to be more relevant and responsive to the needs of target clientele in the rice production sector.
- Climate change has its negative impacts and that zanjera farmers need support to enhance their adaptive and resilience capacity, and strategy to cope with these changes through: provision of sustained irrigation infrastructure in lieu of or to complement the temporary traditional 'arbeng' or brush dam; augmentation of economic losses; and provision of alternative livelihood to reduce the negative impacts of climate change on their rice-based livelihood.

Approved through EdSeCom Resolution No. 10, s. 2020, enjoining concerned government institutions to consider the Policy Recommendations of the research entitled, "Adaptation Strategies to Climate Change Impacts for Resilient Rice-based Production System in Ilocos Norte", presented during the 4th Quarter Meeting of the EdSeCom on November 17, 2020.



Editorial Board

Love Grace dC. Campano
Marilou P. Lucas

Authors

Criselda M. Balisacan
Constante B. Julian
Susan G. Aquino
Erle Stanley G. Damaso

Lay-out/Typeset

Catalino Barroga, Jr.
Lord Ian R. Galano

Production Staff

Joanne A. Abadilla
Ruby Rose A. Sablot

Consultants

Dr. Epifania O. Agustin, Program Leader, ILAARRDEC
Dr. Shirley C. Agrupis, President

Published by the

Mariano Marcos State University (MMSU)
Brgy. 16, Quiling Sur, City of Batac, Ilocos Norte
Philippines
Tel. 077 677-2894

For more information, please contact:

Office of the Director of Research