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Enhancing resilience through capacity building in LCCAP formulation in the local government of Aurora, Philippines

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ABSTRACT

Climate Disaster Risk Assessment (CDRA) and Local Climate Change Action Plan (LCCAP) provide the scientific and legal platform for climate change adaptation and mitigation in the Philippines. This APN CAPaBLE project responds to the limited technical capacity of local government units (LGUs) to comply with this requirement through collaborative capacity building. Evaluation of CDRA and LCCAP led to a National Interagency Technical and Policy Forum to formulate action plans and fast-track preparations. The initial stage of the project demonstrated collaborative advantage as a condition for mobilizing human and financial resources was enabled. Collaborative inertia set in once the technical limitations of Aurora LGUs surfaced to complete the CDRA. This mirrored the results of the institutional capacity survey, administered to 87 disaster risk reduction and management Technical Working Group (TWG) members, highlighting the LGUs limitations in data availability and functional knowledge on climate change. Thus, a shift in capacity building strategy through focused mentoring and managing LGU expectations was done. The Aurora LGUs successfully completed its CDRA and LCCAP requirements through a lengthy and arduous process. It was acknowledged that CDRA preparation has a steep learning curve and competes heavily with other multiple functions and pressing demands from the LGUs. The national interagency forum resolution suggested that the CDRA be assigned to another government agency while LGUs shift capacity development initiatives to understanding and mainstreaming scientific assessment into local plans. The project experience highlights the difficult, yet promising, path to human security development and resilience building and underscored prudence and urgency of adaptation planning at the local level.

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KEYWORDS

CDRA, Climate change adaptation, Collaborative capacity building, Human security development, LCCAP, Local government unit

HIGHLIGHTS

- The LGU's role in achieving climate and disaster resilience is crucial for a hazard-prone country like the Philippines.
- Building LGU's technical capacities in CDRA and LCCAP preparation entails collaborative process and takes time and patience to develop.
- CDRA's steep learning curve warrants a reconsideration of LGUs' tasks, which now need to focus on mainstreaming scientific assessment results into local plans.
- Climate adaptation planning by capable LGUs advances human security and risk resiliency at the local level.

1. INTRODUCTION

The Philippines is one of the countries most at risk to climatic threats and weather-related events. One of the responses of the Philippines is the passage of the Climate Change Act (Republic Act or RA 9729) in 2009, which created an enabling environment to bolster climate change governance in compliance with international frameworks and in line with national and local development initiatives (Adaptation Knowledge Platform, 2012). The establishment of the Climate Change Commission (CCC) ensued, as the agency tasked to coordinate, monitor, and evaluate programs and action plans related to climate change.

RA 9729 mandated the LGUs, as frontline agencies for climate change action, to formulate the LCCAP following the guidebook provided by the Local Government Academy (LGA) and the Department of Interior and Local Government (LGA-DILG, 2017; DILG, 2015, 2016). The LCCAP is a strategy policy that describes measures and policies of LGUs to reduce greenhouse gas emissions (mitigation actions) and increase the community's resilience (adaptation actions) to the impacts of climate change.

A total of 1,489 municipalities and 145 cities, including 81 provinces, nationwide need to prepare this action plan. The sheer number of LGUs that need to be capacitated warrants concerted efforts of government and non-government agencies, including state universities and colleges, to extend technical services for this task.

This project supported the above national priorities and built on existing initiatives towards LCCAP formulation.

1.1. Project objectives

With Aurora province as the LGU beneficiary, the project aimed to enhance its climate resilience by developing the capacity of provincial and municipal personnel in LCCAP formulation.

The specific objectives of the project were:

1. Capacitate LGU personnel on the science, impacts, and responses to climate change and the necessary tools and skills needed in LCCAP preparation;
2. Assess the vulnerability, risks, and impacts in the eight municipalities of Aurora using updated climate models, Geographic Information System (GIS), and participatory methods in partnership with the LGU personnel and other stakeholders;
3. Formulate appropriate local climate change adaptation programs, projects, and activities to reduce climate risks and enhance the resilience of the Aurora province; and
4. Enhance the resilience of services from ecosystems and social structure/human

security to different climate risks.

This paper reports on the experiences, results, outcomes, and lessons learned from the capacity building of Aurora province, including its eight municipalities, in relation to LCCAP formulation.

1.2. Description of the study site

The province of Aurora, Philippines, lies between 121°31'02" and 122°01'30" East Longitude, and 150°31'43" and 160°31'00" North Latitude, and has eight municipalities, namely: Baler, Dingalan, San Luis, Maria Aurora, Dipaculao, Dinalungan, Casiguran, and Dilasag.

Aurora province is situated in the East-Central side of Luzon Island, has a total land area of 309,860 hectares and generally mountainous and the highest forest cover density in the Philippines (Provincial Government of Aurora 2009) (Figure 1). The total population of the province is 228,046 as of 2018. It is included in the Department of Interior and Local Government's (DILG) priority targets in climate change adaptation as the province hosts a major river basin and considered vulnerable to shocks and disasters (LGA-DILG, 2017).

The province's economy is basically agricultural, with rice and coconut as the principal products, and other crops including fruit-bearing trees, vegetables, cash crops/high value commercial crops, and root crops.

The seasonal variations are as follows:

- the DJF (December, January, February or northeast monsoon locally known as "amihan") season;
- the MAM (March, April, May or summer) season; JJA (June, July, August or southwest monsoon locally known as "habagat") season; and
- SON (September, October, November or transition from southwest to northeast monsoon) season.

The climate hazards for the province include flooding, rain-induced landslide, and storm surge.

2. METHODOLOGY

2.1. Climate Disaster Risk Assessment (CDRA and LCCAP formulation

CDRA, a requirement in LCCAP formulation, is "the process of studying risks and vulnerabilities of exposed elements — people, urban areas, agriculture, forestry, and fishery production areas, critical point facilities, and lifeline infrastructure associated with natural hazards and climate change" (HLURB, CCC, UNDP, & Australian Government, 2015). Based on the DILG Memorandum Circular 2015-77, the CDRA framework consists of six steps, accomplished by completing a set of matrices:

- Step 1. Collect and organize climate change and hazard information.
- Step 2. Scope the potential impacts of hazards and climate change.
- Step 3. Develop the exposure database.
- Step 4. Conduct a climate change vulnerability assessment.
- Step 5. Conduct a disaster risk assessment.
- Step 6. Summarize findings.

Indicators and assessment scales were developed to measure exposure, sensitivity, and adaptive capacity of the following: population, natural resource-based production areas, critical point facilities, urban use areas, and infrastructure and utilities. Climate change scenarios for future risk assessments were sourced from the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), hazard maps from the Mines and Geosciences Bureau of the Department of Environment and Natural Resources (MGB-DENR), and sectoral data from different municipal offices.

LCCAP formulation entails a visioning exercise, identification and prioritization of adaptation and mitigation strategies, and development of a monitoring and evaluation system. The procedure is guided by DILG's Enhanced LGU Guidebook on the Formulation of Climate Change Action Plan.

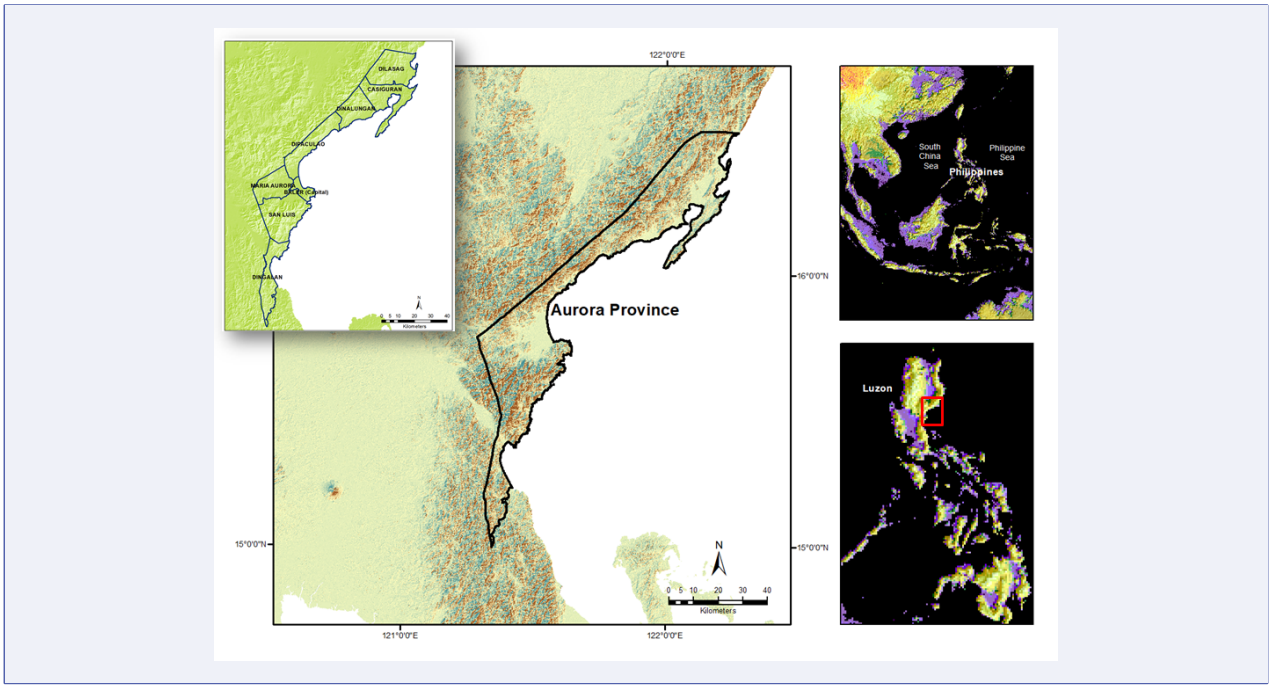

FIGURE 1. Location map of Aurora, Philippines (Sources: PhilGIS, Philippine Statistics Authority, and Global Digital Elevation Model, 2020).

The above tasks were accomplished through training, workshops, and writeshops for the Technical Working Groups (TWGs) of the Aurora LGUs from July 2017 to December 2019. Specialists from the University of the Philippines Los Baños – Interdisciplinary Studies Center for Integrated Natural Resource and Environment Management (UPLB-INREM) were assigned to each municipality to oversee progress and guide in integrating LCCAPs from municipal to provincial levels (Figure 2).

FIGURE 2. The TWG of Dinalungan, Aurora completes the CDRA matrices with assistance from a UPLB specialist during the workshop held in Baler, Aurora.

2.2. Institutional capacity analysis

The institutional capacity assessment survey was based on Friend and MacClune (2012), and Tyler and Moench's (2012) characteristics of resilient institutions: "Access Rights and Entitlements", "Information Flows", "Decision-making Processes", and "Application of New Knowledge". Additionally, Cardona et al.'s (Cardona et al., 2012) capacities for institutions to manage disaster risks in the context of resiliency were used: "Capacity to Anticipate Risk", "Capacity to Respond", and "Capacity to Recover and Change". A Likert-scale questionnaire that consists of several statements relating to each institution characteristic measured institutional capacity. Participants indicated their agreement or disagreement with each of the statements on a 5-point scale: (1) very dissatisfied to (5) very satisfied.

The survey was administered to TWG members in-charge of crafting the CDRA and LCCAP. Eighty-seven respondents/personnel of disaster risk reduction and management TWGs answered the institutional capacity questionnaire, or 97% of the expected respondents.

2.3. Capturing lessons from capacity development

Best practices and challenges in building capacities of LGUs towards the formulation of CDRA and LCCAP were documented for future activities, such

as review of CDRA and LCCAP policy and guidelines. Also, sharing of learnings and experiences with another UP unit assisting LGUs, the University of the Philippines Resilience Institute (UP RI), was done. This led to the organization of a National Interagency Technical and Policy Forum on CDRA and LCCAP.

3. RESULTS AND DISCUSSION

3.1. The road to resilience: A collaborative approach towards LCCAP formulation

This capacity building initiative is no less than a collaborative endeavour between UPLB-INREM and Aurora LGUs. In this context, the experiences in project implementation will be discussed, including accomplishments and problems encountered. Focus was given on the aspect of "process", as well as concepts of "collaborative advantage" (i.e., the potential for synergy from working collaboratively) and "collaborative inertia" (i.e., relates to the often disappointing output in reality) in the practice of collaboration (Huxham, 2003) .

A Memorandum of Agreement (MOA) was signed in November 2017 between UPLB-INREM and the Provincial Government of Aurora, to build the province's capacity in developing its LCCAP. The provincial government allocated PhP 3.5 million (USD 72,280.00)[1] to include the eight municipalities and APN's CAPaBLE funds.

UPLB-INREM mobilized a team with various expertise and organized training and provision of technical assistance. In addition, a TWG was formed for the province and each municipality, consisting of heads of different key offices (agriculture, environmental, social welfare, health, and engineering among others) for the LCCAP's completion.

The initial project stage demonstrated "collaborative advantage" as all elements were mobilized, including human resources, additional funds, and an enabling environment provided by the governing body. Subsequent activities were planned, particularly the CDRA training.

From 2017 to 2019, a series of training activities were conducted in Baler, Aurora and in Los Baños, Laguna for the following activities: Participatory Risk and Vulnerability Assessment (PRVA) (Figure 3), gender analysis, CDRA and LCCAP formulation, visioning, project brief writing, prioritization of adaptation projects, and institutional capacity building.

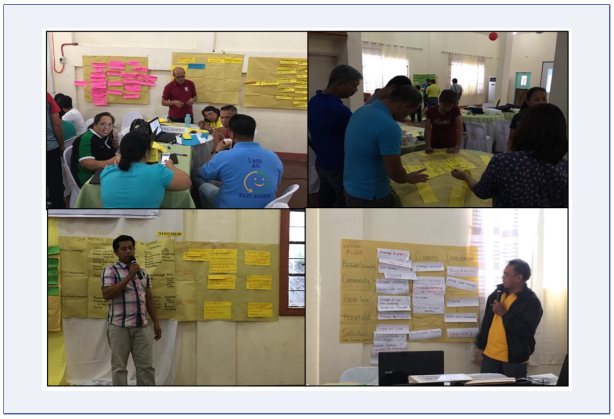

FIGURE 3. TWG members attend the CDRA training held in November 2017 in Baler, Aurora.

Almost a year through the project, "collaborative inertia" set in. The parties were concerned with the minimal progress in CDRA vis-à-vis the enormous tasks remaining for LCCAP. It seemed that the "classroom-style training" was not effective in upskilling the TWGs. UPLB-INREM identified major obstacles and recalibrated its strategies, which included assigning a specialist to guide each TWG through the CDRA process. UPLB-INREM also reviewed the CDRA matrices and based on the Housing and Land Use Regulatory Board (HLURB) guidelines and related literature, developed indicators for exposure, sensitivity, and adaptive capacity assessment, a task previously assigned to the TWG. A rating scale was designed and equations for vulnerability and risk values were embedded in the matrices.

On 20-21 October 2019, the completed LCCAPs were presented to the municipal council for review and fiscal planning consideration. The next day, the provincial LCCAP was presented to the governor and provincial TWG and was immediately adopted, ending on a high note the more than two-year capacity building efforts for LCCAP formulation.

[1] 1 USD = 50 PhP (2018)

FIGURE 4. The UPLB project team, municipal TWGs, and UPLB graduate students complete the participatory risk and vulnerability assessment in Baler, Aurora.

The development of CDRAs and LCCAPs for Aurora and its eight municipalities can be considered first of its kind in rendering technical assistance in a capacity building setting. It went through a long iterative process that made the capacity building work. However, this approach's drawback is the prolonged implementation, which resulted in the project's request for a half-year extension.

The collaborative advantage was highly influenced by the provincial government's leadership and UPLB-INREM in creating an environment geared towards providing solutions and supportive of accomplishing the project goal. Meanwhile, the collaborative inertia was due to a lack of sufficient or updated data and unsuitable capacity building methods vis-à-vis the highly technical nature of CDRA and LCCAP. This was eventually hurdled by shifting strategies and managing municipal TWG's expectations.

Collaborative inertia was more apparent throughout this capacity building project, and fully achieving collaborative advantage between extension agents (e.g., academia or other national agencies) and LGUs presents quite a challenge, particularly in the context of decentralized functions on very scientific and strategic versus political and operational tasks. The former may be unfamiliar territory for the LGUs. Understanding the ins and outs of how science works necessitate a longer time than the period given to produce the plan. On top of this, the preparation of the plan competed heavily with other functions of the LGUs.

The CDRA and LCCAP process was both daunting and lengthy, but rewarding for both parties. Undeniably, navigating through the demanding and sometimes ambiguous process improved both parties' capacities in climate action planning. Other valuable outcomes observed were the LGUs' heightened appreciation of the CDRA and LCCAP processes and a greater sense of ownership. These conditions help instil a "moral obligation" among the LGUs to ensure that the adaptation plan is implemented, thus paving the way towards the goal of resilience.

3.2. LGUs: The frontline in climate change action

The term institution is defined as "an organization or body that has responsibility for one or more aspects of natural resource governance and development" (Moore, Zhang, & Triraganon, 2011) . Its role in climate and disaster resilience is crucial for a hazard-prone country such as the

Philippines. The capacity of LGUs to craft and implement decisions despite uncertainty spells a big difference in climate governance and ensuring resiliency against adverse impacts.

The institutional capacity survey in Aurora revealed that the municipal and provincial LGUs scored highest and performed better in disaster risk management, namely the capacity to respond (3.626), capacity to anticipate risk (3.514), and capacity to recover and change (3.513). This is not surprising as the Philippines has already set up a protocol for disaster preparation, response, and management through the Philippine Disaster Risk Reduction and Management Act of 2010. Note that in terms of institutional resilience, "capacity to respond" ranked first, which is consistent with the current institutional framework that focuses on mitigation, response, and recovery (Domingo, 2016) .

Scores for the four characteristics of resilient institutions ranked the lowest (average weighted scores below 3.5): access rights and entitlement (3.492), decision-making processes (3.460), application of new knowledge (3.383), and information flows (3.283). The characteristic "access rights and entitlement" covers the human, material, and financial resources of Aurora LGUs. Based on the LCCAP formulation experience, TWG members have limited technical capacity. Material and financial resources were also inadequate to support projects and other operations. Nevertheless, all respondents agreed that opportunities to attend training sessions were well supported by the LGU.

Summary of average weighted scores of the institutional capacity of Aurora TWGs.

The decision-making processes of LGUs follow an established protocol that encompasses the administrative, legislative and executive functions of institutions. Capacity to implement decisions scored the highest among the list of statements in this parameter.

The resilience indicator, where Aurora LGUs performed poorly, was in "information flows" including access to accurate information to guide risk and vulnerability adaptation options. The difficulty of TWGs in completing the CDRA was a testament to this due to lack of data for risk assessment and linked to a lack of financial and/or human resources for data collection and management.

The survey results mirrored both the merits and deficiencies of the Aurora LGUs in LCCAP formulation. Its completion represented a milestone in climate adaptation and institutional resilience, yet a lot of things need to be done to achieve institutional resilience, as follows:

- Improving database management systems to support scientific risk assessment;
- LGU officials need to be knowledgeable on both climate change and watershed approach;
- Monitoring and feedback mechanisms should be in place to collect historical data for probabilistic simulations; and
- Improving human, material and financial resources

3.3. Creating an enabling environment above and beyond compliance

The partnership between UPLB-INREM and Aurora LGUs noted problems in CDRA and LCCAP formulation as follows: inconsistencies in the CDRA and LCCAP guidelines (such as rating scales and systems of interest), lack of data, changes in staff involved in plan preparation, and lack of technical capacity to prepare maps. On top of these, LGUs are swamped with regulatory, operational, and management tasks, including preparing more than 30 other local plans as required by Philippine laws. Regrettably, some LGUs opted to complete the LCCAP just for the sake of compliance.

LGUs should then be provided with opportunities to facilitate proper crafting of the LCCAP. UPLB-INREM took note of all the challenges and teamed up with UP RI to discuss issues, challenges, and possible ways forward to assist LGUs in speedily crafting a more responsive climate action plan. This prompted the two units to jointly organize, together

Institutional Capacity/Resilience Indicators	Average Weighted Score	Rank
Access rights and entitlement	3.492	4
Decision-making processes	3.460	5
Information flows	3.283	7
Application of new knowledge	3.383	6
Capacity to anticipate risk	3.514	3
Capacity to respond	3.626	1
Capacity to recover and change	3.513	2

TABLE 1. Summary of average weighted scores of the institutional capacity of Aurora TWGs.

with the CCC, a National Interagency Technical and Policy Forum on CDRA and LCCAP. It was held on 7 January 2020, at the Crowne Plaza Hotel, Manila (Figure 5). It was the first of its kind to bring together different agencies to tackle this issue, focusing on each agency's role for the LCCAP mandate, the bottlenecks experienced, and suggestions to improve the overall process.

All agency presentations concluded that the CDRA process is the major stumbling block in LCCAP formulation. CDRA preparation is constrained by the following: 1) steep learning curve, including effective cascading of expertise to the LGUs; 2) lack of human resource; 3) data-intensive; 4) challenges on its sustainability (resources and resource mobilization); and 5) appreciation and accountability of LGUs.

A forum resolution was drafted with the following recommendations:

1. Institute a focal office/unit for climate change (similar to Disaster Risk Reduction Management Office) in the LGUs for compliance and accountability;
2. Coach and mentor (instead of train) LGUs in CDRA and LCCAP preparation, and requiring training for elected LGU officials;
3. For DILG, CCC and NPTE, monitor CDRA completion and mainstreaming into development plans, including ensuring the alignment of LCCAP with the Comprehensive Land Use Plan (CLUP) and Comprehensive Development Plan (CDP);
4. Tap Higher Education Institutions (HEIs) as technical service providers to LGUs in CDRA and LCCAP, and address issues on resource mobilization;
5. Create an Inter-agency Technical Working Group to develop a unified framework harmonizing the guidelines and tools (such as the probabilistic risk assessment, smooth translation from spatial to sectoral) for CDRA and LCCAP;
6. Agree on the scale of government unit for CDRA preparation (whether provincial, regional, and national) and capacitate LGUs in enhancing assessment and mainstreaming results in the plans. It is recommended that the national government prepare the CDRA, and this goes into the CLUP as a chapter; and
7. Include some data requirements for CDRA (e.g. data on the different exposure units and vulnerable communities) in the Community-Based Monitoring System (CBMS).

The resolution also calls for creating an inter-agency TWG to develop a unified framework harmonizing the guidelines and tools (such as the probabilistic risk assessment, smooth translation from spatial to sectoral) for CDRA and LCCAP. The resolution would be presented to the DILG.

3.4. Contribution to human security development and resilience building

Human security is one of the objectives of the Philippines' climate change framework towards achieving resilience. This is defined as "the state where the rights of the Filipino family and individuals, especially the poor and vulnerable, are protected and promoted through access to education,

FIGURE 5. Participants of the National Interagency Technical and Policy Forum on CDRA and LCCAP.

health, housing, and social protection while ensuring environmental sustainability" (NCCAP 2011-2028). Under this agenda, it is expected that the risks of climate and disasters would be reduced especially for vulnerable groups.

Climate change poses many security concerns, particularly in the areas of environment, livelihoods, health, and settlement. These include conflict over natural resources, social unrest, threats to livelihoods, population displacement, the spread of epidemics, failure in delivering social services, and other detrimental disruptions. Some security issues may be derivative, rather than immediate impacts of climate change. Nevertheless, the above affirms that climate change is development-oriented rather than a mere environmental problem Mason (2013) .

Resilience is defined as "the ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a potentially hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions" (Lavell et al., 2012) . Resilience-building requires an understanding of the vulnerability of different components of a system. These include agents, institutions and systems (infrastructure and ecosystems); identification of key areas where intervention is crucial; and strategic planning process that highlights resilient characteristics to be achieved for each system component and the whole system in general in the context of variability and uncertainty (Friend & Macclune, 2012) .

The LCCAP as a medium for mainstreaming climate change in local development provides a blueprint for a new governance brand that emphasizes strategic foresight and system complexities while navigating through future uncertainties. The novel challenges require LGUs to be innovative, exercise anticipatory capacities, and learn from traditional and indigenous practices that have survived the changing times.

Therefore, the formulation of the LCCAP lays an important foundation towards the path of human security and climate resilience. Through this APN CAPaBLE project, the important actors for resilience building, i.e., the local government units or institutions, were trained not only to comply with but to internalize the LCCAP formulation process leading to a robust risk assessment, specific entry points for actions, a vision for managing an uncertain future, and context-specific adaptation strategies. The problems encountered and lessons learned also led to important recommendations that are hoped to facilitate the country's LCCAP formulation process through relevant policies.

While it may be hard to tell whether the recipient LGUs have achieved resilience since the LCCAP is yet to be implemented, what is certain is that the seed for building it has been planted. A more

favourable environment for its growth has been defined, specifically in easing the technical responsibilities of the LGUs and building their capacities for effective utilization of risk assessments as an integral part of local development plans.

4. CONCLUSION

The UPLB-INREM and Aurora LGUs demonstrated that a collaborative process is a key approach in building capacity of LGUs for LCCAP development. A formal arrangement through MOA provided an enabling condition that guaranteed commitment and accountability of both parties and paved the way for immediate mobilization of human and financial resources.

Technical capacities, particularly for CDRA, took time and patience to develop, leading to collaborative inertia. A focused mentoring translated into significant accomplishments but entailed additional work. It is then better to manage LGU expectations as probing into institutional capacity revealed limitations in data availability and functional knowledge on climate change.

While the Aurora LGUs successfully completed the LCCAP, the impediments that the process revealed warranted a reconsideration of expected tasks. Time is crucial in climate response, and lengthy planning process could jeopardize systems that are already vulnerable and may be problematic in fitting in LGUs' fiscal plans. Although commissioning specialists to satisfy this requirement is an option, lack of appreciation on the process could be a hindrance in promoting a sense of ownership and a lure to comply for compliance sake.

With this, the National Interagency Technical and Policy Forum on CDRA and LCCAP recommended facilitating the LCCAP process by addressing CDRA's steep learning curve. It includes freeing the LGUs from the CDRA procedure and shifting capacity building to understanding and mainstreaming this scientific assessment into adaptation plans.

It is yet to be seen how the above recommendations would be acted on by relevant authorities at the national level. Nevertheless, this capacity building initiative, which ended with the formulation of LCCAP and an evaluation of this process, highlights the development nature and resilience-building objective of adaptation planning, which should be accomplished with both prudence and urgency.

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LGUs, including the Provincial Government of Aurora as well as the Municipal LGUs of Dingalan, San Luis, Maria Aurora, Baler, Dipaculao, Dinalungan, Casiguran, and Dilasag.

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