SEMINAR PROCEEDING

2018 Southeast Asia
Disaster Risk Governance Academic Seminar

24-26 September, Bangkok, Thailand

RDM RISK AND DISASTER MANAGEMENT PROGRAM

rdi Resilience Development Initiative

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Acknowledgements

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IFRC would like to thank the ASEAN Committee on Disaster Management for its partnership, the ASEAN Secretariat for its indispensable support to the seminar, and Red Cross and Red Crescent National Societies and partners for their participation. We are deeply grateful to the Faculty of Political Science of Thammasat University, the primary academe partner and host for this seminar. We also thank the following associate academe partners for their invaluable support: Bandung Institute of Technology (Indonesia), the Disaster Risk and Resilience Program of the Ateneo de Manila University (Philippines), the Resilience Development Initiative (Indonesia), the Risk and Disaster Management Program of Chulalongkorn University (Thailand), the S. Rajaratnam School of International Studies of Nanyang Technological University (Singapore), and the Stephen Zuellig Graduate School of Development Management of the Asian Institute of Management (Philippines).

Most importantly, IFRC would like to express its gratitude to the Government of Canada and the Canadian Red Cross for generously supporting the organization of this academic seminar.

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Acronyms

AADMER	ASEAN Agreement on Disaster Management and Emergency Response
ACDM	ASEAN Committee on Disaster Management
ADPM	Asian Disaster Preparedness Center
ASEAN	Association of Southeast Asian Nations
ASEC	ASEAN Secretariat
CBDRM	Community-Based Disaster Risk Management
CCA	Climate Change Adaptation
CSO	Civil Society Organization
DRR	Disaster Risk Reduction
EMS	Emergency Management System
IFRC	International Federation of Red Cross and Red Crescent Societies
LGBTQI	Lesbian, Gay, Bisexual, Transgender, Queer or Questioning, Intersex
NDMO	National Disaster Management Office
SGBV	Sexual and Gender-based Violence
UNDP	United Nations Development Programme
UNISDR	United Nations Office for Disaster Risk Reduction

Foreword from ASEAN

The 2018 Southeast Asia Disaster Risk Governance Academic Seminar was held in Bangkok, Thailand, to discuss the direction and needed actions to develop a framework for disaster risk reduction, as part of the "ASEAN Peer to Peer Learning: Disaster Law and Policy Platform". We are all aware that ASEAN went through a significant turning point in 2005 through the adoption of the AADMER, setting a framework for cooperation, including technical cooperation and mobilization of resources, in various dimensions of disaster management in ASEAN.

Following AADMER, a disaster management work programme was introduced by ASEAN to transform policy and plans into implementation. The AADMER Work Programme 2016-2020 aims to provide a platform for dialogue, shared learning, training, and research on disaster law and policy frameworks, both in terms of their development and implementation, between ASEAN Member States.

The disaster law peer learning platform forms part of the cross-cutting strategy of institutionalizing the AADMER, a strategy that is considered as one of the six buildings blocks of the AADMER Work Programme 2016-2020. The disaster law peer learning platform also falls under AADMER Priority Programme 3 on Advance, specifically Component 1 on "strengthening institutional capacity and policy frameworks for effective implementation of DRR and Climate Change Adaptation (CCA) actions."

This regional seminar provides the opportunity to ground academic research on actual experiences by NDMOs, Red Cross Red Crescent National Societies and other non-government stakeholders in ensuring that AADMER provisions are supported by their domestic legal frameworks.

The Co-chairs of the ACDM Working Group on Prevention and Mitigation (Thailand and Lao PDR) would like to thank the ASEAN Committee on Disaster Management (ACDM) Chairperson and Members of ACDM. Especially, thank you IFRC, ASEC, Thammasat University and agencies concerned, both in Thailand and within ASEAN Member States, for their support.

Mr. Vilayphong Sisomvang
Co-Chair of ACDM Working Group
on Prevention and Mitigation
Lao PDR

Mr. Chayabol Thitisak
Co-Chair of ACDM Working Group
on Prevention and Mitigation
Thailand

Foreword from IFRC

I would like to start by acknowledging communities in several ASEAN Member States who are currently facing disasters, in particular in the Philippines following the devastating typhoon as well as in Attapeu, Lao PDR and Lombok, Indonesia. Our National Red Cross Red Crescent Societies are working hand in hand with governments and partners to provide necessary relief and support at the time they recover from the shocks.

In each emergency, we see the ASEAN solidarity in action, and the importance of local actors who are first on the scene. As we respond to emergencies, we also come to understand the importance of having strong policies in support of our joint action, not only in the relief phase, but to build strong and resilient communities in the region.

IFRC recognizes academia as an essential partner in building credible, scientific knowledge about disaster risk and climate change, and in stimulating discourse on the role of institutions, laws and policies towards inclusive and climate-smart disaster risk governance. No one organization, institution or government can manage or resolve the many complex issues related to climate and disaster risk governance alone – that is why a partnership and networked approach is essential to achieve the best outcomes we can. This workshop and our discussion over the next three days is testament to this.

For Red Cross and Red Crescent, it is essential that our governance discussions are firmly centered around people – women, men, boys and girls. We place high value on the positive impact that human- centered stories and in-depth research have on disaster risk management policies and community resilience actions.

Since 2007, The IFRC Disaster Law Programme, working together with National Societies across Southeast Asia, has conducted research and has provided technical assistance to Southeast Asia governments in crafting effective disaster laws. This includes country-level research on "Law and Disaster Risk Reduction" in 4 ASEAN Member States, and country-level research on "International Disaster Response Laws, Rules and Principles" (IDRL) in 5 ASEAN Member States. Just this year, the Disaster Law Programme in partnership with the ASEAN Committee on Disaster Management launched the ASEAN Disaster Law Mapping Report, a research which maps the institutionalization of the ASEAN Agreement on Disaster Management and Emergency Response (AADMER) in domestic disaster laws. The Disaster Law Programme has also supported 7 ASEAN Member States in disaster law review and drafting processes.

After years of research and technical assistance on this topic, we have learned that is not enough for us to settle with generic "disaster laws" that only look at institutional mechanisms. We at IFRC commit to work with Southeast Asia National Societies and partners to advocate for better integration of protection, gender and inclusion (PGI) measures in disaster law frameworks. Most recently we have scaled up our efforts to ensure better links to prevent and ensure protection from sexual and gender- based violence in disasters and to highlight the important role that disaster law can play in this regard.

This is reflected in the IFRC's recent collaboration with ASEAN on research that chronicles the negative impact of disasters on sexual and gender-based violence – particularly on at-risk women, girls and boys in Southeast Asia - and includes recommendations on how these considerations could be better integrated into disaster laws.

With that, I hope that the partnership between IFRC and the academic community will pave the way for a more open and in-depth discourse on these topics and catalyze a sustainable platform for the exchange of knowledge and good examples on effective legal frameworks for inclusive and climate-smart disaster risk governance across Southeast Asia.

I would also like to acknowledge the financial support of the Government of Canada as well as the Canadian Red Cross, our trusted and long-time partners with regards to Disaster Risk Reduction, Gender Equality as well as engagement with ASEAN on disaster law issues.

Ms. Michaela Friberg-Storey
Humanitarian Diplomacy Advisor for Asia Pacific
International Federation of Red Cross and Red Crescent Societies

Foreword from Thammasat University

I am certain that we all have realized how frequently we have been affected by natural disasters these days. Those disasters not only caused the great loss of lives and properties, but also had critical impact on economic growth of nations. Therefore, it is our duty to manage the disaster risks with stronger and better governance. Strong governance requires effective legal frameworks which clarify the roles and responsibilities of governments and non-government actors in reducing losses caused by disasters in the ASEAN region and elsewhere in the world.

This conference aims to provide a platform for actors working on disaster risk management and academic institutions in ASEAN to share the results of their research studies and data on policy implementation.

Another purpose of this seminar is to increase the academic work and to provide reliable resources for policymakers who work on laws and regulations for disaster risk management.

On behalf of Thammasat University, it is truly my pleasure to host the Southeast Asia Disaster Risk Governance Academic Seminar and welcome all of you attending this conference. I strongly believe that this conference will provide an avenue to gain insights into policies on disaster risk management.

Associate Professor Gasinee Witoonchart
Rector of Thammasat University


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Concept Note

Background of the Seminar

In April 2017, the ASEAN Committee on Disaster Management (ACDM) endorsed the Chairperson's proposal to collaborate with the International Federation of Red Cross and Red Crescent Societies (IFRC) on the "*ASEAN Peer to Peer Learning: Disaster Law and Policy Platform*". The collaboration seeks to address issues of disaster risk governance in ASEAN and aims to provide a platform for dialogue, shared learning, training and research on disaster law and policy frameworks, both in terms of development and its implementation, between ASEAN Member States (AMS). The peer learning platform is under the AADMER Work Programme 2016-2020 Priority Programme 4 on Advance, specifically Component 1 on "strengthening institutional capacity and policy frameworks for effective implementation" through "developing peer-to-peer support programme among ASEAN Member States to strengthen institutional and policy development related to DRR and CCA."

The first activity under this peer learning platform is the ASEAN Disaster Law Mapping which involved a comparative study and regional consultation on legal frameworks supporting domestic and regional preparedness and response mechanisms among ASEAN MS. This produced the "*ASEAN Disaster Law Mapping: A Regional Stocktake*" report which was officially launched on 02 May 2018. The report is accompanied with a compilation of country profiles and an updateable online resource platform.

Building on this collaboration, ASEAN, IFRC, Thammasat University and other academic and research institutions based in Southeast Asia organized the 2018 Southeast Asia Disaster Risk Governance Academic Seminar from 24-25 September 2018, with a closed-door partners' session on 26 September 2018.

The Seminar aimed to enhance knowledge sharing on different climate-smart disaster risk management (DRM) policies and tools implemented across ASEAN, based on best practices in the region, for the benefit of policy-makers and other relevant stakeholders. In support of this outcome, the objectives of the seminar were to:

- Provide a platform for different DRM actors and academic institutions in ASEAN to share their academic and policy research among their peers;

  Increase the body of academic work on climate-smart DRM laws in ASEAN to strengthen the credibility of the thematic area within the region and provide credible resources for policymakers working on DRM laws and regulations;

- Enhance the engagement of academic institutions in ASEAN on climate-smart DRM law and policy; and

- Consider concrete recommendations and next steps to build on this peer learning platform.

In accordance with these goals, the Seminar was designed around presentations of shortlisted academic papers submitted by authors based in Southeast Asia, and parallel feedback sessions by the academic peer review committee members, IFRC and ASEAN. The authors were composed of academics and students specializing on disaster risk management, NDMO staff, Red Cross Red Crescent National Society staff and volunteers, IFRC technical staff, and non-government disaster risk management researchers.

Details of the seminar as well as presentations and academic papers are available on the seminar official page. Opinion expressed in academic papers are of the authors and do not do not reflect IFRC's policies nor opinions.

Themes and Submissions

The main theme for the Seminar was "effective legal frameworks for inclusive and climate-smart disaster risk governance". This theme was primarily aligned with the Sendai Framework for Disaster Risk Reduction (SFDRR) Priority 2 on "strengthening disaster risk governance to manage disaster risk", with lenses on (a) integrating disaster risk governance and climate change objectives and (b) inclusivity. For this Seminar, "inclusive" referred to disaster risk governance measures that ensure the participation and representation of different stakeholders in DRM, especially marginalized at-risk groups. "Climate-smart" referred to disaster risk governance measures that link the objectives of climate change adaptation and disaster risk management within the framework of resilience.

Submissions were categorized according to the following sub-themes:

- **Sub-theme 1: Climate and disaster risk-informed policymaking.** How do decisionmakers take into account climate change and disaster risk into policy-making? What are some good examples of how this is being done at multiple levels? How can the policies be designed and implemented better?
- **Sub-theme 2: Gender and diversity mainstreaming in DRM systems.** Gender and diversity mainstreaming in disaster risk management programs is important in ensuring that the differentiated needs and strengths of women, girls and boys, and LGBTQI are considered throughout the entire process. Incidents of sex and gender-based violence (SGBV) have also been found to increase in the aftermath of a disaster compared to normal times. What are useful examples of legal frameworks and tools that promote and institutionalize the inclusion and / or protection of these groups in DRM? How can these legal frameworks and tools be improved?
- **Sub-theme 3: Institutional structures and mechanisms for inclusive disaster risk governance.** The Sendai Framework for Disaster Risk Reduction underscores the importance of establishing government coordination forums at the national and local levels in strengthening disaster risk governance. Moreover, these forums or platforms are recognized by many stakeholders as important in giving the marginalized at-risk groups a voice in the decision-making table. What are good examples of legal frameworks, institutional mechanisms or tools that enable these forums? How can they be improved?

The following table provides the timeline of the seminar proceeding:

Activity	Date
Call for abstracts	18 June 2018
Assigning abstracts to peer reviewers	18 July 2018
Submission of abstracts	19 July 2018
Peer review of abstracts	19-22 July 2018
Selection of abstracts	23 July 2018
Shortlisted authors drafting academic papers	1-31 August 2018
Submission of draft papers	31 August 2018
Peer review of papers	1-21 September 2018
Seminar	24-25 September 2018
Closed session for dialogue partners	26 September 2018
Sending Peer review report (post-seminar) to authors	30 September 2018
Authors submit final revised papers	31 October 2018
Publication of seminar proceeding	November - December 2018

e participated by (from left to right) Assoc. Prof. Dr. Kitti Prasirtsuk, Asst. Prof. Dr. Tavida Kamolvej, Prof. Dr. Pennung Warnitchai, Ms. Michaela Friberg-Storey, and moderated by Dr. Prajak Kongkirati. Photo credit: IFRC

Seminar Proceeding

There was a total of 66 participants (31 = female; 35 = male) from different fields of work in Southeast Asia, as summarized below. Please refer to Annex I for the complete list of participants.

36	Academics
11	ASEAN and National Disaster Management Offices (NDMOs) and other government agencies
10	IFRC
7	Practitioners from non-government organizations
2	Other Red Cross Red Crescent Movement participants

Of the 66 participants, 24 were the authors of academic papers that were selected from a total of 49 abstracts through a peer review process. Please refer to Annex II for the list of academic papers and link to their presentations.

Abstract submission and selection

Following the call for abstracts which was issued on 18 June 2018, interested candidates were given a month to draft and submit the abstracts. A total of 49 abstracts were submitted to the organizing committee on 19 July 2018. The peer reviewers then provide scores for each of the abstracts. Abstracts were then ranked from one with highest to lowest scores. Peer reviewers also provide comments on each abstract which provide guideline for the subsequent revision and preparation of the academic papers. Annex III provides a list of peer reviewers and peer review terms of reference. Annex IV provides guiding questions based on which the scores were given.

Twenty papers submitted by professional candidates and four papers submitted by graduate students were selected on 23 July 2018. Selected authors were given until 31 August 2018 to draft and submit the papers for review.

Academic paper submission and review

The academic papers, submitted on 31 August, were then shared with the respective peer reviewers who were given one month's period to review and comment on the papers. The written comments were later shared with the respective authors after the seminar on 31 September.

Academic seminar

The academic seminar had two main components. The first two days (24-25 September) were dedicated to paper presentations by the shortlisted authors. The last day (26 September) was a half-day event which focused on discussing the way forward for the dialogue and platform for peer to peer learning among the stakeholders in Southeast Asia. The seminar agenda is provided in Annex V.

The following are summaries of the sessions that took place during 24-26 September:

Seminar Opening Ceremony

The seminar began with opening remarks by the following representatives from the host organizations, namely:

1) Assoc. Prof. Gasinee Witoonchart, Rector of Thammasat University (download here)

2 Ms. Michaela Friberg-Storey, Humanitarian Diplomacy Advisor for Asia Pacific, International Federation of Red Cross and Red Crescent Societies (IFRC) (download here)

3) Mr. Chainarong Vasanasomsithi, Deputy Director General of the Department of Disaster Prevention and Mitigation, Thailand and ASEAN Representative (download here)

The keynote speech was given by Prof. Pennung Warnitchai, Head of Department of Civil & Infrastructure Engineering, Asian Institute of Technology, who discussed key issues related to disaster risk reduction in Southeast Asia. Click here to view presentation.

Prof. Pennung Warnitchai from the Asian Institute of Technology discussed disaster risk reduction issues in Southeast Asia.

Panel Discussion on "Effective Legal Frameworks for Climate-Smart and Inclusive Disaster Risk Governance"

On the first day of the event, the following panelists were invited to discuss about the status of disaster risk governance in Southeast Asia:

1) Mr. Chainarong Vasanasomsithi, Deputy Director General of the Department of Disaster Prevention and Mitigation, Thailand and ASEAN Representative

2) Mr. Herve Gazeau, Disaster Risk Reduction Manager

3) Dr. Tavida Kamolvej, Dean of Faculty of Political Science, Thammasat University

4) Ms. Iria Touzon Calle, Risk Knowledge and Analysis Programme Officer, UN International Strategy for Disaster Reduction

Disaster risk governance is defined by the UNISDR as "the system of institutions, mechanisms, policy and legal frameworks and other arrangements to guide, coordinate and oversee disaster risk reduction and related areas of policy." This year's theme on effective legal frameworks for climate-smart inclusive disaster risk governance puts a spotlight on disaster risk management legal frameworks or disaster laws, and how these can be best utilized to enable the resilience of all social sectors and ensure the responsiveness of DRR actions to climate change impacts. The panel discussion was an avenue for the Thailand government, Thammasat University, IFRC and UNISDR to share their insights on the progress of law, policy and research as enablers of resilience.

For Thailand, the adoption of the National Disaster Risk Management Plan was key to institutionalizing a shift in focus, from reactive disaster management to proactive and longer-term disaster risk reduction programs, in line with the priorities of the Sendai Framework for Disaster Risk Reduction 2015-2030. The national plan guided the adoption of various DRR strategies, most importantly on risk assessment, enhancing sustainable disaster recovery and promoting international cooperation on DRR.

The academic community in Thailand has also been conducting extensive research on various aspects of disasters. However, as there is still a gap in dialogue between academia and national bodies in terms of linking research findings and implementation, it would be strategic to form a platform for academics and practitioners to facilitate this dialogue. Thammasat University also encouraged the academic community to conduct more participatory research methodologies that consider valuable inputs from local communities and national authorities.

UNISDR underscored three key areas of work to enhance disaster risk governance in ASEAN Member States: improved risk knowledge for a functioning risk governance system, decentralized disaster risk management systems, and risk-informed development. The centrality of linking research data to decision-making is markedly present among these areas of work. Enhanced disaster laws that prioritize risk reduction over emergency management, including the mainstreaming of DRR into relevant sectoral legal frameworks that have an impact on disaster risk, are one of the identified enablers for enhanced disaster risk governance. In light of this function, enhanced disaster laws truly have a big role in tying all of these components together.

Since 2007, the IFRC Disaster Law Programme has been working with National Societies and governments in Southeast Asia to promote and assist in developing effective disaster laws. Earlier research and dialogue had focused on international disaster response laws, rules and principles (IDRL).

Reflecting the shift from response-focused policies to policies that prioritize disaster risk reduction, IFRC has since then worked to highlight the role of legal frameworks in enabling inclusive disaster risk reduction and continues to do research and facilitate dialogue on inclusive and climate-smart DRR legal frameworks.

Academic papers presentation. Photo credit: IFRC

Presentation of Academic Papers

Sub-theme one:

Climate and disaster risk-informed policymaking

How do decision-makers take into account climate change and disaster risk into policymaking? What are some good examples of how this is being done at multiple levels? How can the policies be designed and implemented better?

The papers presented under this sub-theme all highlight the important role of local governments in enabling disaster risk reduction and climate change adaptation at the community level, including through policy-making. Since policy-making is a process that involves not only government institutions but also the stakeholders that stand to gain or lose from policy outcomes, it is important for people to exercise their right to information, and to have the means to do so through appropriate enabling laws and regulations. In relation to this, while financing mechanisms are important tools for disaster risk reduction and climate change adaptation, these will only be meaningful if local actors have sufficient information and understanding of how these financing mechanisms can be accessed and used.

Achieving meaningful community resilience and effective local policies require accurate data from the ground. To achieve this, formal local institutions have to maintain strong engagement with community members, including key local sectors, such as farmers and fisherfolk, who are one of the most vulnerable to the impacts of disasters and climate change. Similarly, schools have a big role to play in educating the youth about the concept of resilience. In addition to traditional modes of teaching, games have been observed to be effective in understanding the disaster risk management cycle, disaster scenarios, and lessons learned from past disasters. Sufficient understanding of climate and disaster-risk among the youth and other community members, which in turn enables bottom-up risk assessments, are key building-blocks of climate and disaster-risk informed policymaking.

Sub-theme two:

Gender and diversity mainstreaming in disaster risk management systems

Gender and diversity mainstreaming in disaster risk management programs is important in ensuring that the differentiated needs and strengths of women, girls and boys, and LGBTQI are considered throughout the entire process. Incidents of sexual and gender-based violence (SGBV) have also been found to increase in the aftermath of a disaster compared to normal times. What are useful examples of legal frameworks and tools that promote and institutionalize the inclusion and/or protection of these groups in DRM? How can these legal frameworks and tools be improved?

The papers presented under this sub-theme discussed the topics of SGBV prevention before, during and after disasters as well as inclusion of women and other minority and vulnerable groups in DRR-related tools and policies.

SGBV is a result of inequality and abuse of power, the papers suggested. Adolescent girls and boys are found to be most at risk when disaster occurs. The cases of early marriages and domestic violence often rise after the disaster. Coordinated community intervention approach can result in longer term prevention of SGBV prevention. Such approach includes strengthening coordination among service centers, looking at behaviors of the perpetrators, stronger child protection mechanism, and putting in place stronger referral pathways.

In developing DRR tools and policies, inclusion of women is essential to ensure gender equality. Similarly, minority and marginalized groups should also be provided with access to information and decision-making process. Informed consent as well as confidentiality should be secured when carrying out psychosocial support to disaster victims as well as humanitarian practitioners.

Academic paper presentation. Photo credit: IFRC

Academic paper presentation. Photo credit: IFRC

Sub-theme three:

Institutional structures and mechanisms for inclusive disaster risk governance

What are good examples of legal frameworks, institutional mechanisms or tools that enable platforms for government and stakeholder coordination on inclusive disaster risk governance? How effective are these platforms in giving the marginalized at-risk groups a voice in the decision-making table? How can they be improved?

The topics under this sub-theme discuss a wide array of examples on coordination platforms, ranging from participatory public consultation processes for local and regional ordinances on disaster risk reduction, to more novel methodologies of automated weather systems for climate information, early warning information crowdsourcing and the use of space-based technology for bottom-up or community based local risk assessments.

A key learning from these submissions is that achieving inclusive disaster risk governance can only be done when inclusive participatory processes are operationalized throughout all phases of disaster risk reduction, preparedness, response and recovery. It is also important to focus on meaningful consultation, and how this can be done in spite of usual budgetary or time constraints of law reform consultations.

Institutional structures and mechanisms for inclusive disaster risk governance are not only essential to enable consultations of affected communities about their needs or positions on disaster risk reduction issues. Given the right set of communication and coordination protocols, these can also be effective platforms for evaluation and validation of program implementation, data gathering and data validation.

Presenters of the academic paper presentions. Photo credit: IFRC

Practitioners' Presentations

To highlight the ongoing activities carried out by practitioners in relevant fields, the following presenters shared the existing experiences as well as mechanisms developed by their respective organization with regard to development of law that support international and domestic humanitarian assistance.

1) Disaster Risk Governance and the ASEAN Agreement on Disaster Management and Emergency Response (AADMER) by Randy Adrian, Officer of Disaster Management and Humanitarian Assistance Division, ASEAN Secretariat. Click here to view presentation.

   The presentation focused on the AADMER programme's component which is complementary to SEA disaster risk governance, particularly the Priority Programme (PP) no. 3 *"Advance - Advancing ASEAN Community that is safe, resilient to disasters, and adaptive to climate change, with youth and good governance at the centre"* and PP 8 "*Lead - Strengthen ASEAN's regional knowledge management system and mechanism, and professionalism to enable ASEAN to become the global leader and centre for excellence and innovations in disaster management."*

   Under PP3, ASEAN supports the development of peer-to-peer learning programme among ASEAN Member States to strengthen institutional and policy development related to DRR and CCA, and to encourage exchange of knowledge and experiences among the member states. A project was led by OXFAM and completed in 2017 under which were case studies conducted in Myanmar, The Philippines, Thailand, and Viet Nam to review the community-level actions to enhance disaster resilience.

   Under PP8, the ASEAN Science-based Disaster Management Platform (ASDMP) was established and implemented by the APEC Climate Center. The ASDMP platform: (i) provides a platform to disseminate, understand, and use scientific research, (ii) supports and increases the dialogue amongst the group of producer and user of DM knowledge (NDMOs, relevant government agencies, academic community, regional research institutions, and CSOs).

2) Checklist on Law and Domestic Preparedness and Response by Pauline Caspellan-Arce, Regional Disaster Law Officer, IFRC Asia Pacific. Click here to view presentation.

   Ms. Caspellan-Arce emphasized the overall framework of the IFRC Disaster Law Programme, which is using the "law as an agent of social change". This underpins all of IFRC's work on Disaster Law, advocating legal preparedness as an enabling tool to reduce human vulnerability to disasters.

The presentation discussed about the new research being developed by the Programme and led by her colleague Rachel McLeod, which aims to identify best practices and gaps on legal frameworks for disaster preparedness and response. The research was initiated based on requests for technical support from Red Cross Red Crescent National Societies and governments.

The research methodology includes a desktop survey with respondents from 20 countries to look at existing law on disaster response and literature review of international legal materials that tackle disaster risk management. Based on these data, a synthesis report will later be done to form questions that will be listed as a checklist for disaster law and domestic preparedness and response e.g. existing institutional framework, funding and resources, and legal facilities etc. (see the presentation in the above link for more information on the draft Checklist items).

3) From Global Pilot Projects to Indonesian Policy Context by Prakarma Raja Siregar, Climate and Resilience Advisor Red Cross Red Crescent Climate Center. Click here to view presentation.

The focus of the presentation was on forecast-based early action to reduce human casualties from disasters and save assets. With the improvements in forecasting science, there is an increasing area or opportunity for targeted early action within the short window (from hours to weeks depending on the hazard) before disaster strikes.

Forecast–based Financing (FbF) is a mechanism that uses climate and weather forecasts to enable timely disbursement of funds to implement advanced preparedness actions before a potential disaster happens and early response intervention. Some challenges to FbF include the quality of the forecast, the policy environment as well as the capacity of actors to engage in this short timeframe.

Since 2007, the RCRC movement has been developing pilot projects of the FbF mechanism in more than 15 countries. The German government has supported several FbF pilot projects (2015-2019). The pilot activities provide recommendations for revising/finetuning the models.

In Indonesia, Palang Merah Indonesia (PMI or Indonesian Red Cross) is in discussions to become eligible for the FbF fund established by IFRC. The Government of Indonesia also has its own funding mechanism to support local governments, in line with its decentralization processes. A new regulation is expected in 2018 on "minimum services" for local governments, including having risk information available. In order to access funding, local governments need to declare a state of emergency at various levels. In practice, accessing funds from the national level may take a long time, hence not compatible with the short window of time for early actions.

There is an opportunity to access "village funds" for disaster management activities which is distributed directly from national to village level. Such fund offers more flexibility and an opportunity to support emergency preparedness/early actions.

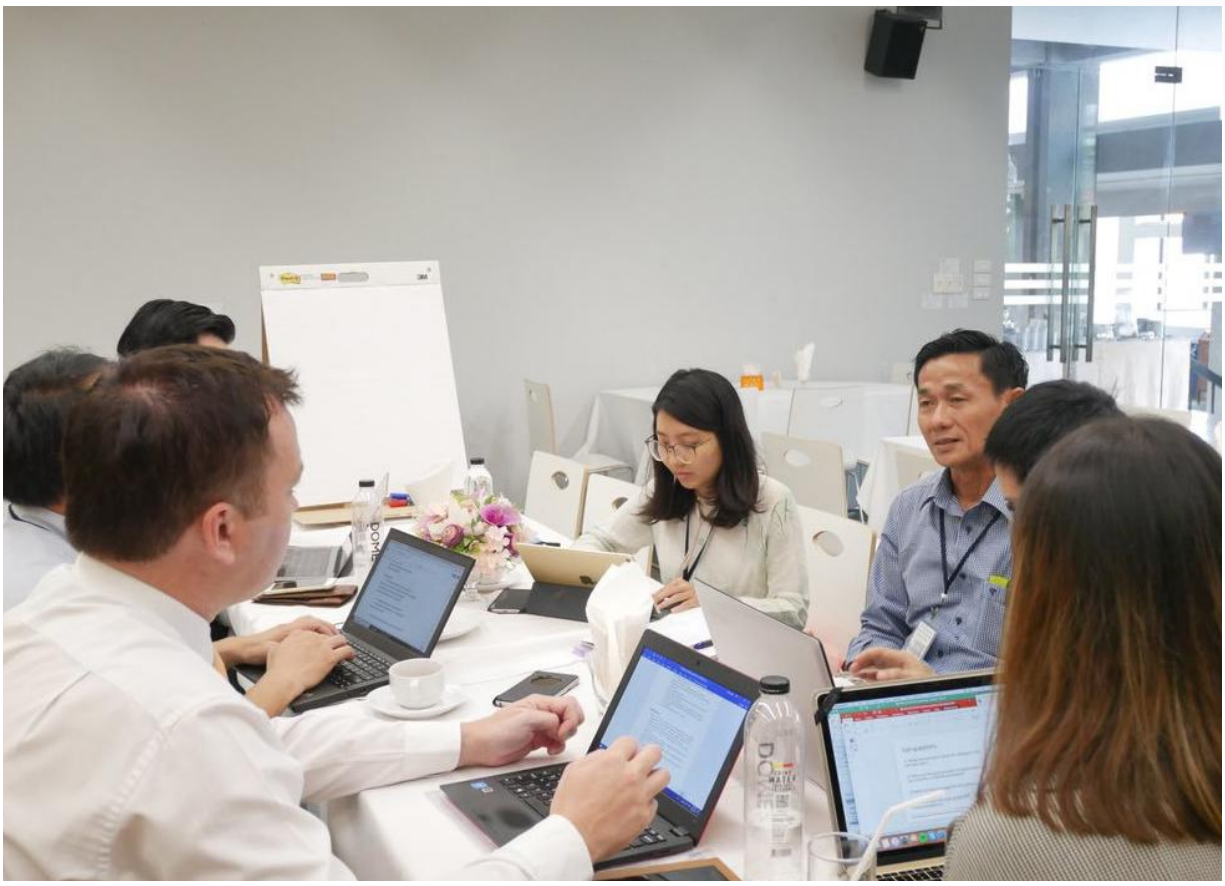
Discussion on the way forward for the peer-to-peer learning platform.
Photo credit: IFRC

Closed Session and Recommendations

On the last day of the seminar, a closed session was held for a discussion between key participants from different sectors (i.e. government, Red Cross Red Crescent Movement, practitioners, academic partners, and ASEAN) on the "Way Forward to Build Collaborative Regional Disaster Risk Governance". Below are the recommendations on key areas to be explored.

- To develop multi-country research as a mechanism to maintain dialogue and collaboration between the partners.
- To involve people from other sectors e.g. economists to share research works in the same topic.
- To engage more policy makers and local government heads of "mega-cities" in ASEAN to join the platform to translate the research into actions.
- To take advantage of digital platform such as social media to share information among the partners.
- To present the research findings in a simple and interesting way, and tailored to a target audience e.g. with figures and infographic.
- To conduct a workshop that focuses on translating academic research into simple policy recommendations, and a workshop on innovative ideas that will appeal to policymakers.
- Academic partners can draw from their research best practices in terms of disaster management and convey to policy makers to help guide the development of policies.

- To establish a network of academics, practitioners, and government agencies (similar to the existing Gender and Diversity Network) where focal persons are identified and committed to participate in regular dialogue. This is to ensure the continuity of the dialogue and to build on the discussion of new ideas and exchange of experiences.
- To create a database of academic, practitioners, and government agencies, tabulated according to sectors for easy mobilization.
- To increase the quality of engagement between practitioners and academics by involving the latter in program implementation, such as baseline-end line assessment, disaster response operations, etc., in order to solicit inputs from an academic perspective, and vice-versa to provide access to practical knowledge from the field and effective use of data.
- To engage academics in developing a data literacy course via the IFRC Online Learning Platform, to help build capacity of stakeholders in data collection and analysis.
- Establish a database for publishing papers related to disaster risk governance, together with copy editing and summarizing assistance.
- To identify research areas and topics, e.g. transboundary issues or regional cooperation, that that provide value-added recommendations and are relevant at the ASEAN level.
- To use the Disaster Risk Governance Academic Seminar as a platform to map out future research needs at the regional level.
- To reflect on the best way to engage the participation of more partners from different sectors in the next DRG seminar, and to re-design the academic structure of the dialogue into something more engaging for both academics and practitioners.
- To match academics and practitioners for the peer reviewing process, in order to provide authors with both academic and practical comments to their work.



Discussion on the way forward for the peer-to-peer learning platform. Photo credit: IFRC

Academic Papers

The following are the peer-reviewed papers of academics who have presented their abstracts in the seminar. Abstract entries of academics who did not submit their final papers are likewise included in this section for reference.

SUB-THEME 1

Community resilience to urban flooding: A Case Study of the 2011 Flash Flood in Matina, Davao City, Southern Philippines

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Abstract

Flooding is a common occurrence in different parts of the Davao City, Philippines. Its effects are catastrophic in proportion costing damage to properties and loss of lives – to vulnerable groups e.g., children, women and senior citizens. Communities need to build its resiliency to respond to flash floods and mitigate its negative impacts, while policy makers and leaders need to consciously, regularly review and update its existing policies to address gaps and promote effective community engagement. Flooding in streets due to drainage problems is observed in Davao City during heavy downpour of rain. Flash floods, however, are not.

This is a case study of the 2011 flashflood of Barangay Matina Crossing, Davao City, Philippines and its impacts to development. The incidence recorded damage to properties and loss of lives and indicated urban vulnerability. Utilizing the Crunch Model as an analytical framework, it captured factors in the progression of vulnerabilities and institutional dynamics and shared community social capital. There are gaps on disaster management, related policies and its implementation. Results show positive social relationships as shown by well-coordinated volunteerism among different organized groups and institutions that allows quick emergency and needed response to affected communities. However, there is a need for a well-defined context specific disaster response framework at the community to further build resilient communities that can facilitate the reduction of vulnerability to flooding. More so given the physical characteristics of Davao City with river systems draining towards Davao Gulf and passing through densely populated area like Matina. Community-based policies and processes must be strengthened, promote effective community engagement in disaster preparedness and management, including emergency response to flash floods as the study area is considered as high risk for flooding.

Keywords: urban vulnerability, community resilience, urban flooding, social capital, risk communication

Introduction

The Philippines in general is considered as very vulnerable to climate change (Lasco, R. D., et al, 2009) as an archipelago. According to Auzzir, Haigh & Amaratunga (2014), the role of government and financial restrictions are the two major problems that both developing, and least developed countries face when managing disasters. Flooding has serious implications to development initiatives especially in densely populated urban areas, exposes and increase communities to further risks and hazards. However, it also open avenues for identifying weaknesses in both social and physical dimension of the city's development. Flash flood occurrences are seriously intertwined not only to our physical environment but also to governance both at the local, regional and national level, specifically domestic policy issues and concerns. Vulnerabilities increase among groups where extreme poverty is observed. The linkages between poverty, marginalization, over-population, and vulnerability is clearly established where the poor are more likely to live in vulnerable areas, e.g., flood plains (Stephenson & DuFrane, 2002) who are exposed and more vulnerable to flash floods.

The frequency of typhoons and storms that pass through the Philippine archipelago makes it more vulnerable to flooding (Magalang, 2010). The International Bank of Reconstruction and Development in 2012 considered flooding as the most occurring natural event in the urban areas, thus, "poses a challenge to development and the lives of people, particularly among the residents of rapidly expanding towns and cities in developing countries". Davao City is a major urban hub in southern Philippines covering an area of 244 hectares is considered one of the largest city in the world. It is typhoon free, but it is susceptible to dangerous floods in areas adjacent to Davao City's rivers, one such area is Barangay Matina Crossing 74-A, the locale of this case study about the late-night flash flood incident last 28 June 2011. The residents were caught unaware and unprepared resulting to serious damage to properties and loss of lives.

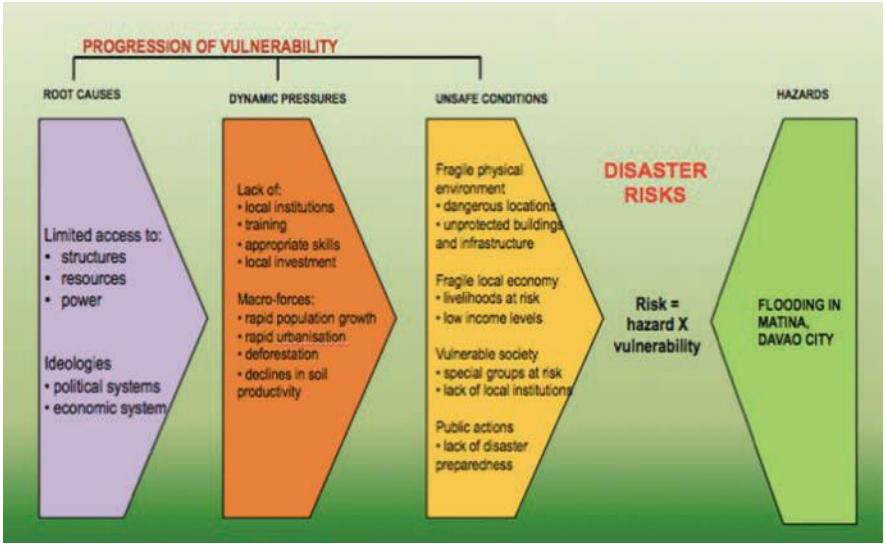
The case study on 2011 flash flood in Matina, Davao City, Philippines aims to:

1. To identify the factors and consequences (e.g., casualty, damage to properties, etc.) of the 2011 Flashflood
2. To narrate how the local institutions, groups, individuals' response measures during and after the flash floods.
3. To analyze some of the post crisis programs undertaken by the different sectors
4. To determine insights drawn from the disaster experience.

However, this case study only focused on the flash flood that occurred on 28 June 2011 at the following areas, Matina Pangi, Matina Crossing and Matina Aplaya barangays in Davao City. The affected communities were situated near river banks, thus, prone to sudden onset flooding. Secondary sources of information were gathered such as reports, zoning maps, and local and international plans (e.g., CLUP, Zoning) and substantiated with key informant interviews that were affected by the flash flood. Results of a study on the post-crisis evaluation of the flashflood were also utilized to provide more clarity and understanding of the case. Descriptive analysis was done using tables/matrices and the corresponding analysis of data and information generated from secondary sources were interpreted using related literature on disaster, vulnerability and development.

Utilizing the crunch model as a conceptual framework (Smyth, et al., 2012) to organize information, sort through complexities surrounding the flash flood incident, and the over-all analysis in terms of community resilience and governance to mitigate the negative impacts of flash flood incident to most vulnerable groups within a community. This model shows that vulnerability (pressure), which is rooted in addressing socio-economic and political processes to reduce the risk of disaster. The model is among those earlier approaches in disaster management is still relevant by situating it to flash flood incident in Davao City and how organizations pool together both human and capital resources to respond to the situation. In fact, in a related study crunch model explores how it can help organizations build resilience by adapting it to accommodate both the tangible, intangible and social or cohesive factors of organizational resilience (Elwood, 2009). The framework helped identify and analyzed the factors that affect/surround the flash flood incident with the assumption that "disaster" in this case the flash flood in 2011 happens when hazards affects vulnerable people.

Figure 1. Conceptual Framework



- "unsafe conditions" may be: poor housing conditions, dangerous location, risky livelihoods, lack of disaster preparedness skills, etc.
- "dynamic pressures" may be: no community organization for collective efforts to reduce flood risks, rapid migration tendencies that change the social structure, the lack of local markets for small farmers to sell their produces or buy agricultural inputs, etc.
- "root causes" may be: government negligence of sand mining in that river, the lack of government policy on flood warning systems and land use planning, poor men and women are not allowed to attend meetings on flood mitigation and emergency response preparedness, etc.

The model was utilized due to its strength and emphasis placed on the factors exerting pressure towards the progression of vulnerabilities. In this case, flood risk is a function of exposure (physical, social), social vulnerability and capacity, the latter is a progression of vulnerabilities by underlying both social and environmental/physical dynamics. The seeming gap in city planning - plans are in-placed, however, what is happening on the ground is contrary to what is contained in the different city planning documents, e.g., increase of human settlements in high risk areas (river banks), sprouts of subdivisions, conversion of agricultural areas to other uses upstream, seeming lack of enforcement of rules and regulations, stakeholders disjointed initiatives and other areas of governance in mitigating disasters, among others leading to the progression of vulnerabilities as used in this case study. When tipping point is reach as in this 2011 case of flash flood, it provides insights on how people and their communities build resilience. A post crisis analysis in the context of the Disaster Management Cycle perspective (Khan et al., 2008) is also employed in detailing the post flash flood management of needed interventions and engagements of various groups including volunteer groups.

Materials and Method

The following procedures were undertaken by the researchers in conducting this case study and how data were generated, processed and analyzed, to wit:

1) A review of related literature consisting of reports, existing plans, previous cases and other materials were scanned, examined and utilized, (i.e., reports, journal articles, LGU plans (CLUP, geo-hazards, NDRRMC Plan, etc.)

   a. The post disaster report of the 2011 Matina, Davao flashflood was the major data utilized to describe the situation and the relevant information about the disaster.

2) Descriptive analysis employing the use of matrices using the Crunch model as an analytical framework. Analysis of data and information generated from secondary sources were interpreted using literature on disaster, vulnerability and development from related literature

3) Implications and recommendations were done on the case studied in the context of the correlation between flash flood, disaster management and general development initiatives.

Results and Discussions

A. *Pre-disaster Situation*

Barangay Matina Crossing 74-A, the research locale of the case study is situated in the Southwest portion of Davao City with a total land area of 568 hectares. It has a flat topography stretching towards the Davao Gulf. It covers sixty-three (63) puroks under its jurisdiction, which makes it one of the biggest barangays in the 1st Congressional District of Davao City (Estacio, 2013; Sanchez, 2014). Sixty percent (60%) of its land area is residential, thirty-nine (39%) is composed of commercial and light industries and about one percent is used for agricultural purposes. It is a high-density residential zone consisting of socialized, mid-range subdivisions, and scattered informal settlers.

It was also identified as flood risk and flood mitigating zones were identified. There are two major rivers running along the jurisdiction of the area: Pangi River (which cuts across Purok Sambag, San Isidro, Guadalupe, Mahayahay, Arroyo compound, Balusong, Lopez Village, Alzate compound, Concepcion compound and Doña Francisco) and Davao River which sets the boundary of the two puroks in Matina Gravahan. During heavy downpour especially in upland areas, river overflows which is attributed to the flash flood occurring on 28 June 2011.

The Davao City River on the other hand is one of the seven river basins, which has the largest catchments area of about 1,647 square kilometers, along with the Davao River Basin is its sub-basin - Matina River Basin. As recorded by the Barangay Office, the puroks enumerated above were inundated by the overbanking of the two rivers situated near them for the past years.

As recorded by the Barangay Office, the different units or "puroks, communities reside along inundated rivers banks for the past years and are considered flood risks. The research study area has the presence of minor and major commercial zones such as small, medium and large commercial establishments. Institutions like banks, schools, groceries and public markets are found in the area, along the high-density residential zone, including settlements of informal settlers.

Table 1. Population Distribution of Matina, Davao City

Barangay	Number of Household	Average Household Size	Population Density	Built Up Density
Matina Aplaya	8,022	4.2	96.67	1.23
Matina Crossing	3,083	4.2	64.55	0.70
Matina Pangi	13,545	4.3	21.24	1.13

Classified as Urban area as identified by the OCPD as per guidelines of National Statistics Office

B. ***The Disaster Occurrence***

The Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAG-ASA) identified the presence of Inter-tropical Convergence Zone resulting to thunderstorm clouds. The formation of thunderstorm clouds in the uplands of Tugbok District where the Pangi River originates along with Calinan and Talomo, generated heavy rain which lasted for about three hours. PAGASA recorded 60 mm for 3 hours between 10 PM to 1 AM, within the watershed of Matina-Pangi River. (60mm for 3 hours between 10PM – 1AM as recorded by Pagasa). The overflowing of the Pangi River brought a destructive flash flood to riverside communities. The barrel and volume of water was not expected by the residents, water reached as high as 10 feet (NDRRMC Update, 2011) occurring between 10 PM to 1 AM when most of the residents are asleep. Response team were immediately deployed and made available by barangay and other agencies through the city's 911, barangay disaster volunteer groups, however, they were unable to penetrate the most heavily affected areas due to the strength, and height of the flood waters (10 feet). It was only when the water started to subside that responders were able to reach most of the heavily affected areas.

C. ***The Post-Disaster***

Recovery and Response

Time element in responding to disasters such as flash flood is critical in reducing casualties and damage to properties. Deployment to actual heavily affected areas of the flash flood by different agencies and organizations started six hours after the disaster. Shown below is the summarized timeframe of the disaster response.

- June 28, 2011 --- within the first 6 hours of the disaster, massive relocation efforts were done to put victims on safer grounds (2nd and 3rd floors of the Barangay Hall)
- First-aid teams immediately addressed medical concerns of the victims once settled in the relocation site
- June 29, 2011 --- Captain Joel Santes initiated community kitchen to feed victims
- Relief goods from both government and non-government and church-based sectors and concerned individuals arrived within the first 24-hours after the disaster
- Medical stations were formed by the Baranggay Committee on Health

Figure 2. Post disaster interventions

Various organizations, NGOs, and private individuals forming volunteer groups provided both human and capital resources to aid government respond to the flash flood incident in addition to the government. The responders were identified as: Baranggay Matina Emergency Unit; Barangay Bago Aplaya VEST; Barangay Baliok EAST (Emergency Assistance Service Team); Barangay San Antonio SAVED; Phil Coast Guard, Philippine Navy, Philippine Army, Bureau of Fire Protection; 911 Urban Search & Rescue; Barangay Gov. Vicente Duterte DFRS, Knighthawk Foundation, Inc.; and, the City's Royal Blood Rescue Team, Kabalikat Civicom. This indicated a stronger institution and civic engagements as well as social capital.

Impact of the Disaster

The affected barangays and families are summarized in Table 2:

Table 2. Affected barangays and families

Barangay	Affected Areas	Affected Families	% to Total Affected Families*
Matina Crossing	13	5,660	40.45%
Matina Pangi	8	1,500	10.91%
Matina Aplaya	13	1,304	9.49%

*Total # of affected families in Davao City = 13,746 from 46 areas including two other barangays, Talomo Proper and Maa *(Source: NDRMC Sitrep #8, 3 July 2011)*

Moreover, there were 29 recorded casualties from drowning. Most of these were women and majority were children ages 8 months to 9 years old. This data shows the most vulnerable groups were the ones greatly affected by the disaster. Hence, the interaction of the hazard (flood) with the vulnerable group (children and women) in an unsafe condition resulted to disaster risks for these vulnerable groups. Some of the factors leading to the progression of vulnerability were identified as follows:

- The high rainfall within the watershed of Matina-Pangi River (60mm for three hours between 10pm-1am
- Expansion of agricultural activities upstream
- Expanding urbanization resulting in increase of run-offs
- Siltation, development of sandbar at the mount of the river
- Backflow of Matina-Pangi river due to high tide level

Post Disaster Management

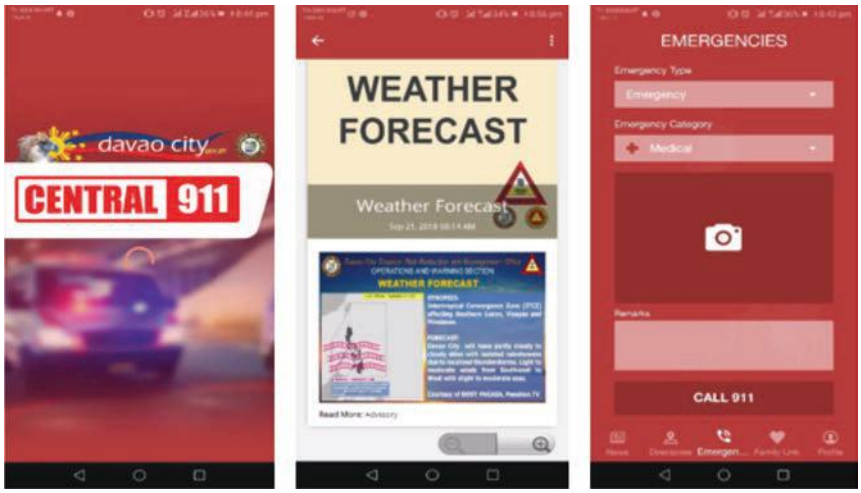
The communities experience in the flash flood incident led to the revival of their Disaster Reduction Management Team (DRRM). Programs for risk intervention were also revived and a more aggressive community engagement, communication intervention to increase awareness of climate change manifestations, and to strengthen the capacity of vulnerable people of their barangay. From a responsive approach, the community transformed to both responsive and proactive towards dealing with flash floods – most are volunteer activities of concerned organizations working side by side with government forces. Meanwhile, risk intervention programs were included in the post disaster strategies (Sanchez, 2014). Similarly, the following measures were also undertaken as part of the Prevention, Preparedness and Mitigation strategies:

- Detailed geohazard mapping in the Talomo and Matina-Pangi River watershed area as an intervening target for a Detailed Geohazard Mapping and Assessment Program (MGB Central, Regional Office & DENR)
- Updated floodway mitigating zone (Urban Zoning Map, 2013 -2022)
- Davao City has only established a Risk Reduction and Management Council, instead of an office as mandated by Law, however, planned to create an office
- Clarity of plans and programs as indicated in the City's Sectoral Plan targeting/mitigating disasters, such as: Disaster Mgt. Program budget of PhP 2 Million for 2013 implementation; Regular de-siltation of rivers and creeks & protection of river banks through planting
- Maintain proper solid waste management
- Installation of Automated Rain Gauges in Tamugan, Calinan and Lacson on June 2013 as warning devices
- Provision of drainage line to Matina River
- Rehabilitation and improvement of drainage system in the study area and the whole of Davao City

The 2011 flash flood incident force both local government and the general public to take seriously implications of similar occurrences in the future as well as the disruption it may bring to their daily lives. Efforts were made at the community level, and both government and private volunteer organizations for information, and education campaign to bring attention to this pressing concern and encourage shared responsibility and accountability.

Presently, an app based 911 platform is made available for use of residents and the rest of the Filipino communities. This allows real time exchange of information and increase shared responsibilities, accountabilities and a more efficient sharing of resources and emergency response to any emergencies.

Figure 3. App-based 911 platform



Conclusion and Recommendations

Davao City is naturally flood prone area manifested by its physical characteristic, its serious implication is magnified with urban population density and human settlements found along the river banks or nearby river tributaries for example the residential, business and institutional areas affected by the Matina Flash Flood. However, the 2011 flash flood in Matina area exhibited a higher level of social capital among its residents, various groups and institutions in Davao and community engagement is evident but remains to be improved. Response was quickly mobilized, although there were advantages due to the City's highly sophisticated search and rescue personnel with facilities and equipment through its 911, however, difficulties were still encountered in difficult to penetrate zones. Their strength plus community mobilization made disaster response not only quick but effective as well. There were casualties recorded and mostly from highly vulnerable groups, i.e., women, children and senior citizens this is not as high compared to other areas with similar situation.

The Crunch Model is an effective tool in assessing vulnerabilities as it captures not only the factors and underlying issues that progresses/increases vulnerability. It also explores institutional and social capital dynamics – in this case as shown in the level of volunteerism and efficient coordinated efforts of various response group from both private and public institutions. Flooding in Davao City should not only be approached within the confines of Davao City geographical boundaries as it has a myriad of dynamics, factors in governances and cross boundary issues. In this connection, it is recommended for stakeholders to harmonize efforts and initiatives and find areas to effectively work together given their varying interests – be it political, economic and environmental. An ecosystem and community-based adaptation (CBA) may be explored to engage most vulnerable communities in activities that can mitigate the ill effects of flash floods in the future such as "community-led drainage clean-up", "neighbors-policing-neighbors" for good practices like planting of bamboos along river banks to avoid further erosion, etc. Incentives for best practices may be designed to encourage further and model communities. Essentially, CBA that is a community-led process, based on communities' priorities, needs, knowledge and capacities on managing disaster such as flash flood (Reid, 2016).

This would empower them and instill the principle of shared growth and accountabilities in flood risk management, reduction/mitigation of flood risks, among others. This is another avenue to develop and further enhance social capital among stakeholders and the general community. But emphasis on areas to work on should be at the forefront of discussion and decision among key players, e.g., local government units, development-oriented groups, etc. Long-term perspective must be central to any development initiatives as far planning and development interventions to mitigate if not avoid flooding in Davao City, particularly in Matina area.

In terms of governance, consolidation of existing policies, regulations, and updating of these essential governance-related documents will always be relevant as communities, cities, and governance aspect is always evolving and transitioning to better respond to various needs of clients. This would include harmonization of efforts, plans, and programs targeted to address flood risks in the study area. It is critical that information, education campaign be upscaled, and to pursue aggressively via flash flood specific materials to put emphasis on the risks anybody is exposed to, and how they can contribute to minimize if not avoid disruption in their daily lives for similar flash flood occurrences in the future.

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Strengthening Capacities of the Local Government Unit of Garchitorena for Disaster Preparedness and Climate Risk Reduction and Management

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Abstract

The study was conducted to determine the disaster preparedness and climate risk reduction and management of the Municipality of Garchitorena focused on farming and fishing. Three most vulnerable barangays were selected in determining the communities' hazard, risk, vulnerability and capacity. The study used descriptive-evaluative and developmental research designs that utilized progressive system of assessment. Primary data was gathered through Participatory Rural Appraisal (PRA) sessions: Focused Group Discussions and Key Informant Interviews. The secondary data was gathered through profiling. Results show that Garchitorena is very vulnerable to natural hazards and climate related risks. Major hazard is typhoon. The risks in agriculture include destruction of farms resulting to very low or no yield, declining in farm income, shifting to gambling. The risks in fishery include decreasing in fish catch, resulting to scarcity in food, very low or no income, shifting to illegal fishing. Risks impact on various sectors were identified. Gaps in disaster preparedness and climate risk reduction and management were discovered. On the basis of findings, current socioeconomic condition of the communities and poor governance in disaster risk reduction and climate change adaptation intensify the vulnerability of the municipality. From the evaluation of the LGU's programs and initiatives, DRR and CCA in agriculture and fishery is behind in its policy and planning. Plan of action is formulated and recommended to strengthen the capacity for disaster preparedness and climate risk reduction and management.

Keywords: Disaster Preparedness, Climate Risk Reduction and Management, Local Government Unit (LGU), Farming and Fishing.

Introduction

The Philippines with 24.32% disaster risk, ranked as the 3rd in the list of countries most vulnerable to climate change (Philippine Daily Inquirer, 2011). The country is highly exposed to natural disasters like storms, floods, droughts and sea level rise because of the country's physiographic and geographic characteristic. This condition is further exacerbated by the fact that it is a developing country, characterized by low level of economic development and poor access to resources (Binoya, et al. 2010). Majority of the country's cities/municipalities are situated along the 36,289 kilometers of coastline with most of its people depending on marine resources and agriculture for livelihood. Garchitorena is one of these municipalities where livelihood systems are most vulnerable to climate change and natural disasters. The impacts that the country are facing, have already been experienced in the Bicol Region including the municipality.

This growing threat of climate change to the global food supply and the challenges it poses for food security and nutrition, require urgent concerted policy and responses. We also need a sharper focus on the important drivers of climate change adaptation, including the potential role of trade to mitigate some of the negative impacts of climate change on global food production (FAO, 2015). Based from the studies of FAO, to strengthen the capacities of selected communities in the Philippines, a situational assessment in the pilot barangays is the first task to be done in order to collect basic information about the communities' vulnerability to climate risks and the factors of determining them. FAO also identified and assessed the existing adaptive responses to climatic risks by the local population.

To contribute to the strengthening capacities of the selected communities in the Philippines, an assessment was conducted in the Municipality of Garchitorena. This study outlines the background, objectives, study process, methods, findings and recommendations which were made on the basis of the assessment in the three (3) most vulnerable barangays: Barangay 1, Canlong and Mansangat. These represent the rural, urban and island barangays and correspond to the municipality as a whole. The result led to a recommendation that would strengthen the capacities of the municipality in disaster preparedness and climate risk reduction and management in farming and fishing.

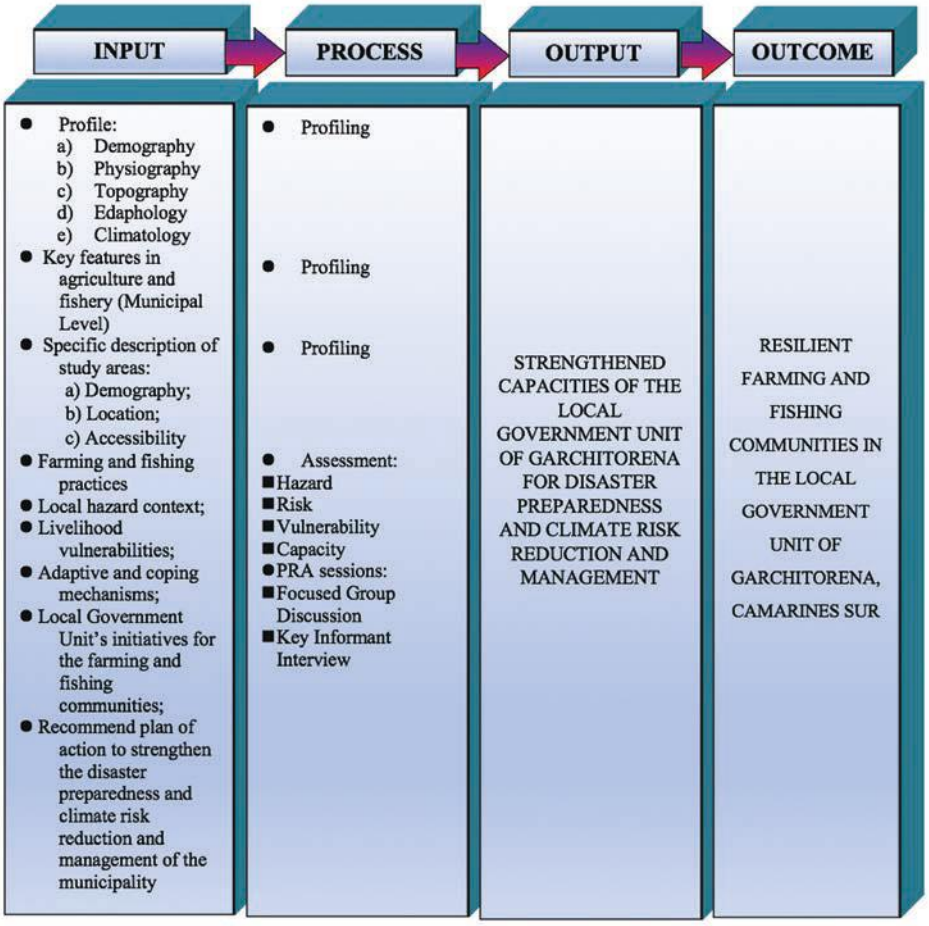
The Conceptual Framework of the Study

The study used the input-process-output-outcome to generate and analyze data that resulted in determining the hazards, risks, vulnerabilities and capacities of the Local Government Unit of Garchitorena focused on farming and fishing. The input-process-output-outcome framework was used in this study because it is the most straightforward way that allows to organize objectives (inputs) for the research, the steps taken in order to achieve the output (process), the immediate result (output) and the desire change (outcome). According to Brown, 1996, the input-process-output-outcome is very useful as it highlights the difference between input, process, output and outcome measures. These different levels of measurement are most meaningful when tracked in combination, UK government. This framework shows the linear relationships between inputs, processes, outputs, and outcome of the study. It also provides a visual interpretation of the different stages the study used to generate the outcome.

The inputs of the study include the profile of the municipality in terms of demographic, physiographic, topographic, edaphic and climatic; the local hazard context; the existing farming and fishing practices in the communities; the livelihood vulnerabilities of the fishing and farming communities posed by climate change risk and natural hazards; the adaptive and coping mechanisms of the fishing and farming communities to the climate change risk and natural hazards; the local government unit's initiatives for the farming and fishing communities to address climate change risk and disasters.

These inputs are transformed into outputs through the processes making use of profiling method, use of the LGU's Comprehensive Land Use Plan, Community Based Management System and other secondary data. On the other hand, data on hazard, vulnerabilities, risk and capacity, farming and fishing practices; adaptive and coping mechanisms and LGU's initiatives have been assessed. From this, outputs in the form of capacities of the LGU for disaster preparedness and climate risk reduction and management has been identified. The effectiveness of the output is realized in further characterizing it in the form of outcome as resilient farming and fishing communities.

Figure 1. The conceptual framework of the study.



Methodology

The study used both secondary and primary data gathering. Secondary data was taken from the Comprehensive Land Use Plan, Community Based Monitoring System, local and international searches. Primary data was generated through field assessments with HRVCA. The primary data was generated based from the time when the municipality experienced the most destructive natural hazard, 1980 to present. Community profiling was conducted through Participatory Rural Appraisal (PRA) session meetings, Focused Group Discussion and Key Informant Interviews. Different tools such as hazard vulnerability context, community historical timeline, hazard and resource map, seasonal calendar, transect walk, brainstorming, Venn diagram, institutional and ranking were used in the study.

The study used descriptive-evaluative and developmental research designs. Descriptive-evaluative design described the study area and evaluate the hazards, risks, vulnerability and capacity in farming and fishing and the gaps in disaster preparedness and climate risk reduction and management. The developmental design was used to formulate medium and long-term plan of action to guide the local government unit in strengthening capacities for disaster preparedness and climate risk reduction and management in farming and fishing. The data were analyzed using the standard analytical process (descriptive statistical analysis including prioritization and ranking) in analyzing qualitative and quantitative data or information, which were gathered in the different phases of the study. The findings resulted to a recommendation in strengthening the capacities of the Local Government Unit for disaster preparedness and climate risk reduction and management.

Results and Discussion

Physical Characteristics of the Municipality

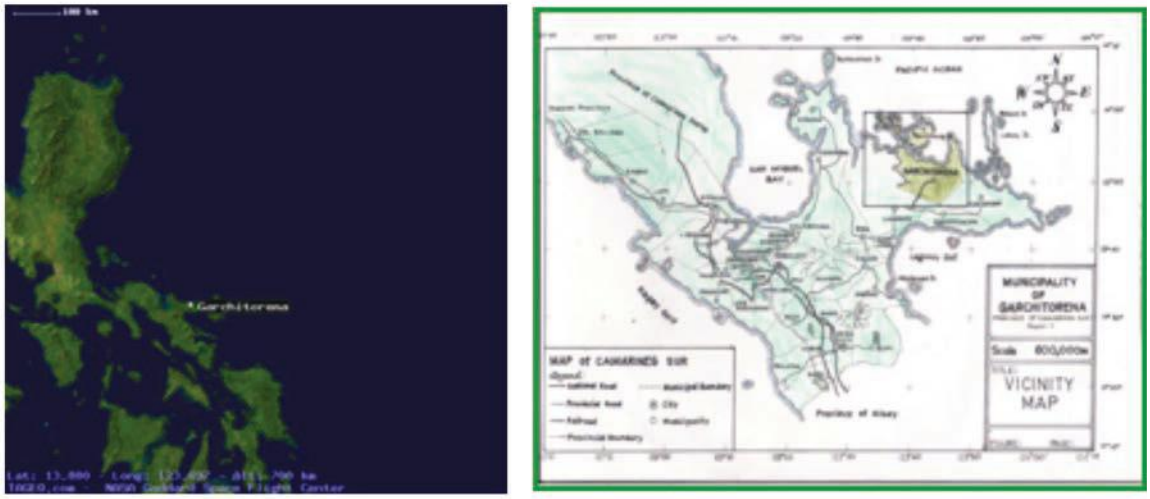
Demography

Garchitorena has a total land area of 273.92 square km. Its total number of household is 4,348 with a total population of 32,061. The total male population is 16,840 and female is 15,217. It is composed of 23 barangays, 20 of which are coastal and 3 are upland barangays. It belongs to 4th class municipalities. The main source of livelihood is fishing and farming.

Physiography

Garchitorena is located in the 4th district of the province of Camarines Sur. The geographical coordinate in decimal degrees (WGS84) are 13.880 latitude and 123.697 longitude. The geographical coordinates in degrees minutes seconds (WGS84) are 130 52’ 47” latitude and 1230 41’ 48” longitude.

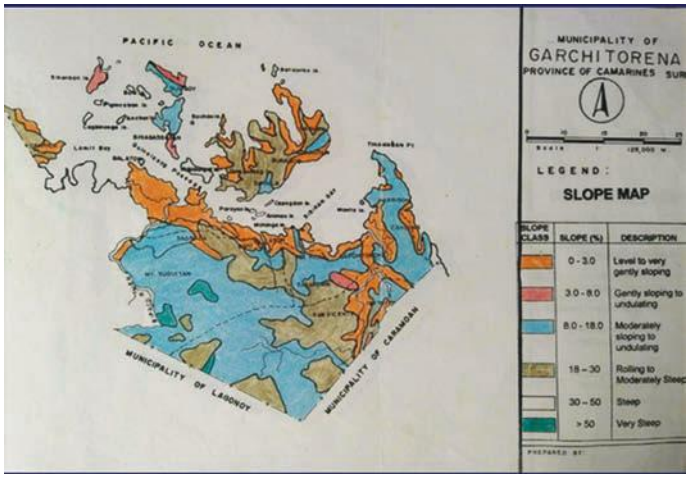
Figure 2. General location map of Garchitorena



Topography

The municipality is generally hilly and moderately mountainous with intermittent stretches of alluvial plains. It has 4,772 hectares (17.42%) of land with 0 to 3 percent slope (level to nearly level). About 4,348 hectares (15.87%) are considered undulating to rolling and classified under 8 to 18 percent slope while rolling to moderately steep areas with 18 to 30 percent slopes cover 11,052 hectares (40.35%). Portions of land area within the boundaries of Lagonoy and Caramoan, covering approximately 7,220 hectares (26.36%) of the municipal territory have steep slopes (30-50). See figure 3 for the slope map.

Figure 3. Slope map of Garchitorena

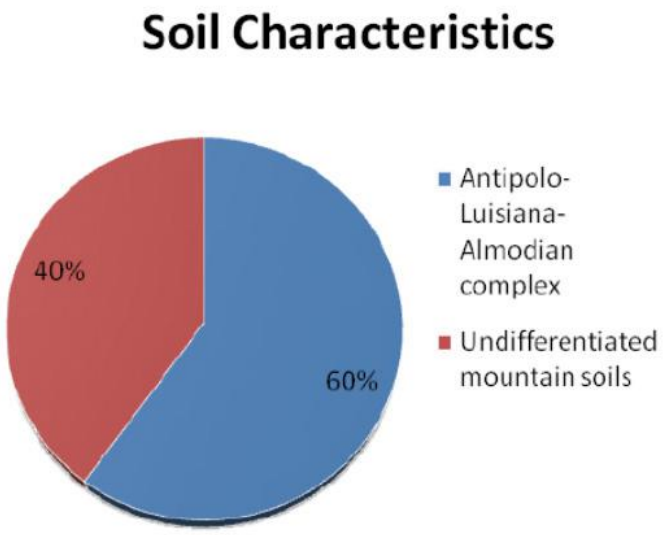


Edaphic

Soil Characteristics

The soils of Garchitorena are divided into two (2) major soil types, they are the Antipolo-Luisiana-Alimodian complex and the undifferentiated mountain soils. The Antipolo-Luisiana-Alimodian complex is of three soils types, consisting of the Antipolo, the Luisiana and the Alimodian soils. See figure 4 for the portion of soil characteristics.

Figure 4. Portion of soil characteristics in the municipality.



Land Cover and Land Use

Table 1 describes the major land cover of Garchitorena. Coconut has the major portion for land use which is 40.71% of the total land use cover.

Table 1. Existing land use. (Source: CLUP)

LAND USE	AREA	%
Coconut	11,151	40.71
Cultivated areas mixed with grasses/shrubs	4,708	17.2
Woodland, preservation forests	10,157	37.1
Wetland, Mangrove	1376	5.02
Total	**27,392**	**100**

Climatic

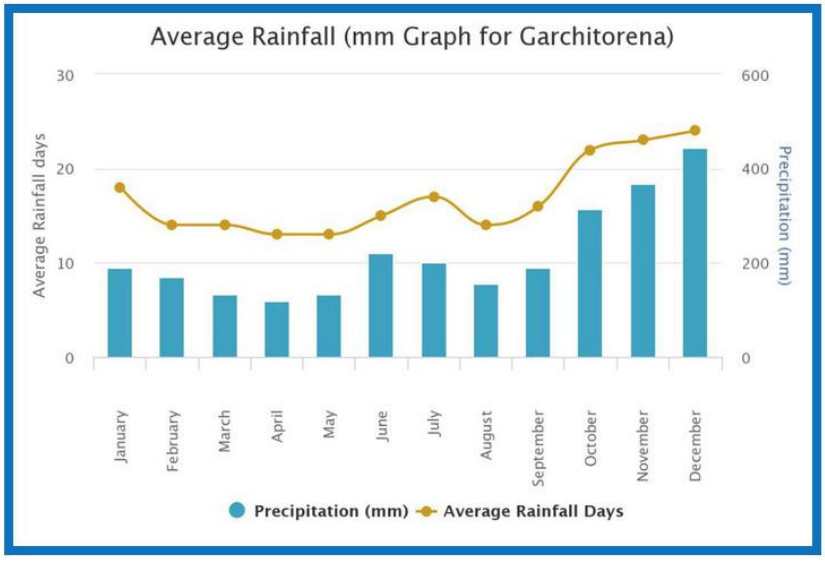
Based from the Modified Coronas Classification, Climate Map of the Philippines, Bicol Region belongs to Type II Climate that has no dry season with a very pronounced maximum rain period from December to February. There is not a single dry month. Minimum monthly rainfall occurs during the period from March to May. Places that has this Type are exposed to North East Monsoon. Tropical Cyclone are frequent in these areas. Garchitorena belongs to this type of climate.

Rainfall

Based from the historical data, the average annual normal rainfall in the municipality is recorded at 2,376.65 millimeters with the highest precipitation occurring during the month of November at an average normal rainfall of 346.14 millimeter. The lowest rainfall occurs in March with an average precipitation of 68.89 millimeter. (CLUP 2000)

Based from the world weather online, data gathered from satellite, in reference to year 2000 to 2012, the months with the highest rainfall are December and November with 490 and 390-millimeter precipitation at an average rainfall day of 24 millimeter.

Figure 5. Average rainfall (mm) for Garchitorena (Source: World Weather Online)

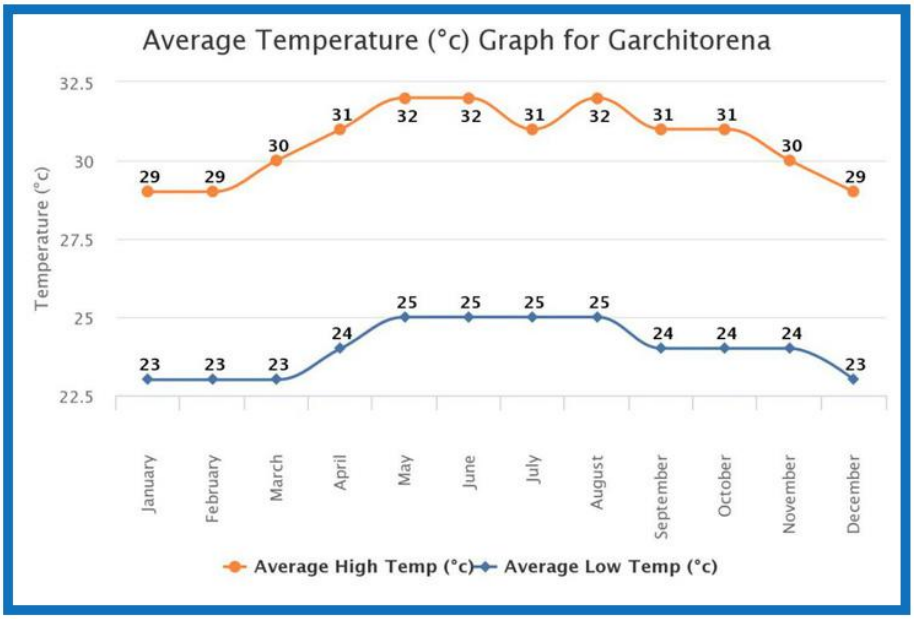


Temperature

Based from the CLUP (with reference in PAGASA), the month of May is considered the hottest month in the area, with a temperature of approximately 33.6 degrees centigrade while the coolest month is January with 20.8-degree centigrade temperature. Generally, because of the inverse relationship effect of temperature with rainfall distribution and relative humidity, areas with higher elevation has lower temperature compared to the lowland areas.

Based from the world weather online, with reference year 2000 to 2012, the average high temperature in Garchitorena appears in the months of May, June August with 320C and the coldest appears during the months January, February and December.

Figure 6. Average Temperature for Garchitorena (source: World Weather Online)



Prevailing Winds

The prevailing wind directions at most station conform to the dominant air streams during different months. The municipality's climate is influenced greatly by the northeast monsoon winds and the trade winds. The northeast monsoon originates from the east of the Pacific and approaches the municipality from the northeast and east directions. The southeast monsoon starts affecting the area during the latter part of May, attains maximum intensity in August and recedes gradually in September.

Weather Disturbances

The municipality of Garchitorena is a typhoon belt area because typhoons and cyclones usually pass over the Pacific Region covering the municipality. Historical Data from the PAGASA shows that only an average of three cyclones for every 2 years passed over mainland Bicol Region. Latest data however, revealed that the area is hit by strong typhoons every after two (2) years. It is observed that the tropical cyclone seasons in the Philippines starts from June to December, which is experienced in the Bicol Region and usually affected the municipality. Cyclone seasons occur from June to December with an average of one typhoon occurrence per month.

Key Features in Agriculture and Fishery

Agriculture

The major part of the land in Garchitorena is agricultural consisting of 15,859 hectares or 57.91% of the total land area of the municipality. 70.3% is devoted to coconut production, 4% is devoted to rice, 2.8% is devoted to root crops, 2.71% is devoted to abaca production and 20.19% is devoted to other high value development crops including vegetable, comprising the agricultural land of the municipality.

Coastal and Marine Ecosystems

Inland Waters

There are four (4) major rivers in the area, namely: the Sipaco, Salog, Bahi and Himanag Rivers. Salog River meanders in the north-eastern direction, traverses the municipality of Garchitorena and discharges in the Sisiran Bay. The mouth of this river meanders near Pambuhan with approximately fourteen (14) kilometres length stretching up to Barangay Toytoy and Barangay San Vicente and extending to the municipal boundary. Himanag River extends approximately eight kilometres and discharges in Sipaco River. Trellis types of creeks likewise feed Bahi River. These rivers produce different kinds of fresh water fishes like milk fish, shrimps, tilapia, and others. Several fishponds in the area produce mud crabs, shrimp and bangus.

Marine Ecosystem

San Miguel Bay is the major fishing ground of the municipality. It is located in the south-eastern part of Luzon Island covering an area of 1,152 km2. The bay features a very shallow area at the inner and central portion (3 to 10 meters) of the coasts that gradually deepens at the outer canal leading to the Pacific Ocean (31 meters deep). Mudflats comprise 95% of the substrate cover with few rocky and coral fringes near the mouth of the Bay. The bay is estuary where freshwater inflow from major river tributaries which significantly dilutes seawater. These waters with mixed origin have higher temperatures, thus possess high-biological production. The climate in San Miguel Bay is characterized by no dry season and heavy rainfall from November to January. The northeast monsoon (November to March) brings extremely strong winds while the south monsoon (June to October) has little or no effect. (Source: Manila Observatory)

Aside from the San Miguel Bay, there are three (3) local fishing grounds providing marine resources to the municipal population. These are Lamit Bay, Sisiran Bay, and the vast fishing grounds of the Pacific Ocean. Large acres of coral reef can be found along the entire length of the Municipal Coasts, which are habitat for varied species of marine life forms. Large mangrove areas are present in the municipality with a total area of 1,206 hectares. Barangay Sagrada has the highest mangrove area consisting of 360 hectares.

The Local Hazard Context

Hazards and Risks

Based from the ranking of risks and hazards, the major hazard in the municipality is strong typhoon that results to secondary hazards like storm surge, landslide, flood, saline water intrusion and strong winds that hit directly to their crops and leave it with very low or no yield. Other hazards are seasonal rainfall or climate extreme that result to secondary hazards like flash floods, siltation and landslide, strong wind brought by Northeast (November-February), Dumagsa (local name) North South wind, Hiraga (local wind) West East wind, Salatan (local name) East West wind (February to March and October to November and Southwest monsoon (June-September), associated with storm surge and saline water intrusion, drought where long dry spell make their lands cracked and unproductive for almost 5 months (April-August), during this time they can't plant rainfed rice since there is no irrigation facilities, the only source of irrigation is natural spring but during months April-August, springs are dry.

Table 2. **Risk and Hazard Ranking.** **Source: FGD**

Primary and Secondary Hazard	Severity of Consequence	Likelihood of occurrence	Degree of Impact	Impact on Various Sectors	TOTAL SCORE	Rank
Typhoon that results to secondary hazards like strong wind, intense rainfall, storm surge, flash floods, saline water intrusion, coastal flooding, sedimentation and coastal erosion.	4	6	3	125	138	1
Strong Destructive Winds Northeast, Southwest and other local winds	1	6	3	21	31	3
Seasonal Rainfall/ Climate Extreme that results to secondary hazards like: coastal and river flooding, landslide, storm surge, siltation, saline water intrusion	1	6	2	77	86	2
Temperature Increase that results to Longer period of Drought	2	6	2	15	25	4
Pests and diseases in Crops	1	6	1	5	13	6
Disease outbreak in Livestock	1	6	1	5	13	6
Sea level rise that results to coastal flooding, saline water intrusion.	1	6	1	16	24	5

The risks were identified based on the communities' perceived risk, current and future risk. The communities felt the effect of climate change where sea level rise is already experienced, there is coastal flooding, frequent occurrence of storm surge and saline water intrusion. Residents already felt increase in ocean temperature during the months of April-August. Mortality in seaweeds due to extreme heat increased and coral bleaching is observed. They also felt strong and intense rainfall right after the extreme heat experienced in the ocean, this phenomenon creates thunderstorms in the months of August and September which already caused death of farmers in two consecutive years. The heavy rainfall results to flood/flash flood and siltation due to rapid runoff, one factor that exaggerate runoff is deforestation. Constituents reiterate that the kind of flooding that occurred today was not really experienced during the late 80's. They admit it is due to deforestation. This flood results to decrease in seashells production near seashores and mortality in corals and seaweeds. Constituents said, during 80's there were abundant marine resources but due to destruction of ecosystem from upland to lowland, production declined during 90's and became worst during 2000's. This phenomenon increased food scarcity and based on the CBMS survey, households living in poverty and food threshold values increased in 2010. (Source: FGD, KII)

These experiences of the local communities, correlated with the studies on climate change impacts. According to Velmurugan and Mathai, 2008, sea level rise associated with increase in sea surface temperature is causing great impact on the coral reef ecosystem. Any sea level rise will allow waves to over-top the reefs, increasing coastal vulnerability to erosion and storms. Increased bleaching coupled with reduced calcification will affect coral growth and reef integrity, as well as reduce the ability of the reef to keep up with sea level rise. At the same time, mass spawning of corals, which are the building blocks of a coral reef and its sustainability, makes them particularly vulnerable to climate change. A miss in a major spawning event can be disastrous to coral recruitment and the replenishment and recovery of coral reef (Naseer, 2006). Consequently, reef fish species, which are specialists requiring specific types of habitats within a reef or specific type of food from a reef, could be adversely affected.

According to Nicholls, 2015, sea-level rise has been recognized as a global major threat to low-lying coastal areas since the 1980s (e.g., Barth and Titus, 1984; Milliman et al., 1989; Tsyban et al., 1990). There is a growing literature demonstrating that the potential impacts of sea-level rise are large. To respond to this challenge interest in adaptation is increasing, even though it is recognized as a difficult and challenging problem (Moser et al., 2012; Wong et al., 2014). Although sea-level rise only directly impacts coastal areas, these are the most densely populated and economically active land areas on Earth. More than 600 million people live below 10 m elevation in the Low Elevation Coastal Zone (McGranahan et al., 2007), and the population is growing rapidly in coastal urban areas (CIESIN, 2013). Coastal areas also support important and productive ecosystems that are sensitive to sea-level rise (Crossland et al., 2005). Coasts are already “risky places” exposed to multiple meteorological and geophysical hazards, including storms and storm-induced flooding (Kron, 2013). Threatened low-lying areas already depend on various flood risk adaptation strategies, be it natural and/or artificial flood defences and drainage or construction methods. The Philippines (Typhoon Haiyan, 2013) demonstrate what can happen in low-lying areas during extreme flood events. Rising mean sea level and more intense storms are expected to exacerbate these risks significantly (Wong et al., 2014).

According to the Climate Change Facts, scientists predict that if the increase in greenhouse gas emissions continues unabated, temperatures will rise by as much as 10 degrees Fahrenheit by the end of this century, potentially causing dramatic—and irreversible—changes to the climate.

The consequences, both anticipated and unforeseen, will have profound ramifications for humanity and the world as a whole. Water supplies in some critical areas will dwindle as snow and ice disappear. Sea levels will rise, threatening coastal populations. Droughts and floods will become more common. And hurricanes and other powerful storms will increase in intensity. Adding to the threat will be the impacts of climate change on agricultural production and the spread of disease. Human health will be jeopardized by all of these changes.

Factors Contributing to the Risk Condition of Farmers and Fisher folks

Major factors contributing to the risky condition of the farmers are: No irrigation facilities, limited support from the local government unit, no appropriate technology to adapt to the changing climatic condition, lack or limited technical knowledge in climate change adaptation and no available appropriate varieties to adapt to different ecosystem’s risk. Factors that contribute to the risky condition of fisher folks include continuous illegal fishing, limited to no intervention from the local government unit, overfishing, weak implementation of municipal fishery ordinance and limited program for coastal resource and management.

The Vulnerability Factors of Farmers and Fisher folks

The vulnerability factors of the farmers and fisher folks were identified through Focused Group Discussion. Factors are given and ranked in percentage according to the insights of farmers and fisher folks. Typhoon associated with strong wind and intense rainfall and illegal fishing are the most prominent vulnerability factor of farmers and fisher folks followed extreme weather events, drought, overfishing, pests and diseases infestations and high input cost and lack of capital. See figures 3 and 4 for the vulnerability factors of farmers and fisher folks.

During typhoons or even the occurrence of strong winds associated with heavy rainfall, farmers and fisher folks have nothing to do but to wait and see the extent of damages that the hazards could bring in their farms. Fisher folks cannot sail and catch fish due to the strong waves, during these seasons. When the typhoon and strong winds associated with heavy rainfall occur for a week or more, the island barangays cannot cross to the mainland to buy for their foods, thus, they suffer from food scarcity. This usually happens during the months of November to February, when typhoons occur, and Northeast Monsoon wind prevails.

Figure 7. Vulnerability factors of farmers

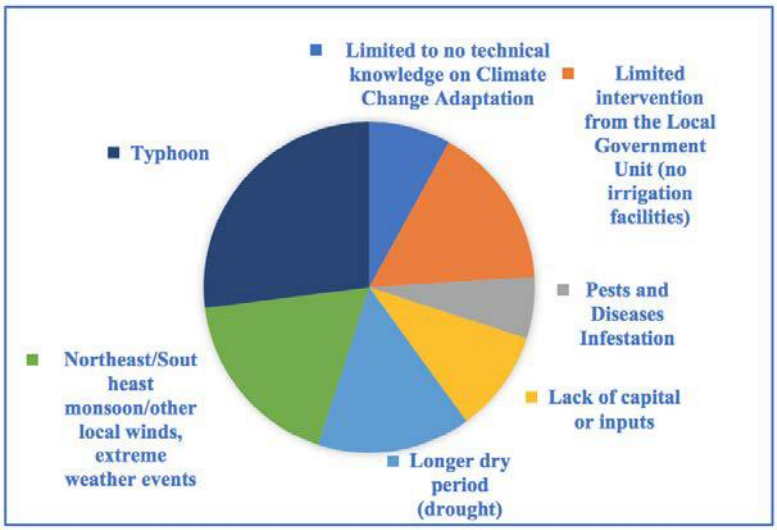
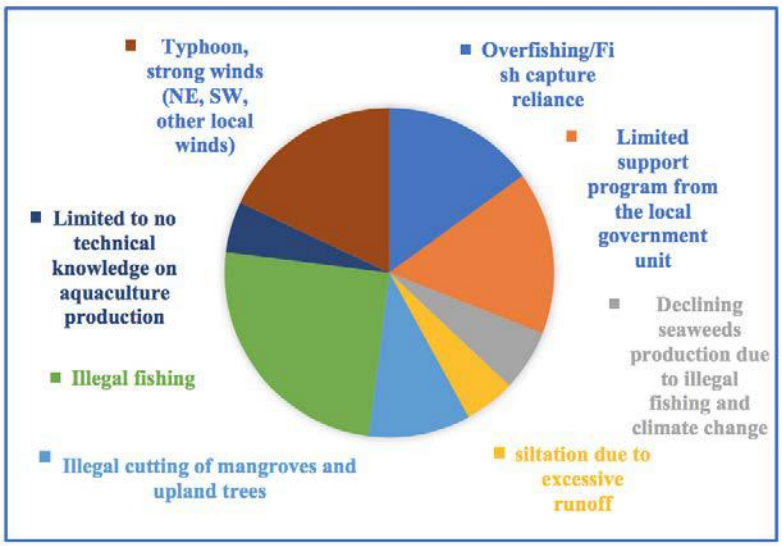


Figure 8. Vulnerability factors of fisher folks



Strengths and Capacities of Farmers and Fisher folks

Strengths and capacities of farmers include: availability of vast farming and fishing area; land ownership; availability of indigenous materials for organic farming; existing alternative livelihood for women; some farmers graduated from Farmers Field School for high value vegetable production, an existing project of the Department of Agrarian Reform on agricultural production with Climate Change Proofing. Willingness of farmers be involved in activities that will capacitate them to lessen the impact of climate change and natural hazards. Coping capacities of farmers during occurrence of typhoons and strong winds associated with heavy rainfall are: involvement in other livelihood opportunities, i.e. buy and sell, cutting of trees for charcoal making, waiting for remittances from their sons/daughters, lending and others are engaged in gambling to survive.

Participants in the focused group discussions uttered that it is a blessing on their part that God gave them a vast area of fishing grounds and rich natural resources. This is one of their strengths, presence of wide area of coral reefs, mangroves and sea grasses that provide abundant different marine species. It is an advantage that they are registered fisher folks of the municipality. These fisher folks are willing to cooperate in the programs that any government or non-government organizations may plan to implement. There are also registered Peoples Organizations that can serve as partners of the LGU in outsourcing projects. Mangrove rehabilitation project implemented by the Bureau of Fishery and Aquatic Resources is another strength of the municipality. Coping strategies of fisher folks during strong winds with strong waves are: engagement in non-fishery based alternative livelihood such as handicraft making, shift to labour work, engagement in agriculture during lean months and lending.

The Coping and Adaptation Mechanisms of Communities

Farmers and fisher folks have their own coping and adaptation mechanisms. Based from the Focused Group Discussion, participants enumerated the changes in climate that they experienced. They have stated the impacts of the changes in their livelihood system and initiate coping and adaptation mechanism to lessen the impact of climate change.

Table 3. Coping and adaptation mechanisms of the communities. (Source: FGD)

Communities' Perception Change	Experienced Impacts on Livelihood Systems	Coping and Adaptation
Decrease in rainfall Longer dry spells (drought)	Overall decline in agricultural productivity	Planting of crops that do not need more water, like shifting from rainfed rice to upland, planting of root crops, delaying the planting of rice and vegetable; watering the vegetable manually to survive lack of water. Planting of early maturing rice variety.
	Drying up of creeks and springs, no planting of rice, vegetables and corn; Rice lands are cracked	If vegetable is already planted, farmers water it manually morning and afternoon, then covering or mulching with indigenous materials like leaves of coconut to give shelter. Delaying or no planting of planting of rice and other crops
	Land become less productive	Buying of foods; switching to other means of livelihood, i.e. fishing, buying and selling.

Communities' Perception Change	Experienced Impacts on Livelihood Systems	Coping and Adaptation
Extreme weather events/ Intense/excessive Rainfall	Damage in new planted crops i.e., vegetable, due to the strong impact of raindrops that affects growth during vegetative stage; Totally damage rice/veg crops due to flood/flash flood; Very low to no yield No income	Construction of temporary drainage canal; Mulching for vegetable production; Switching to another livelihood
	Mortality in seaweeds and corals due to siltation and acidification. Decrease of marine species in mangrove areas; Death of corals affected by acidification due to excessive runoff passing through the fishponds that carry out toxic wastes to the coral reefs;	Seaweeds farms are transferred outside the barangay vicinity, far from the shoreline where sediments cannot affect the growth of seaweeds Fishing outside the vicinity of Barangay or in the open sea
Sea level rise	Damage in rice establish near the seashores due to saltwater intrusion; Decaying of plant, resulting to death. Very low yield.	Relocation of farms; no farming in months when farmers usually experienced salt water intrusion in the farm.
Attack of pests and diseases during extreme climate events especially drought period	Loss/Decrease production in rice, corn and vegetable	Application of traditional methods to avoid the attack of pests in crops; Spraying of insecticides and pesticides;

Conclusions and Findings

Based on the results, it is concluded that the municipality of Garchitorena is very prone and vulnerable to natural hazards and climate change risks due primarily to its geographical location, facing the Pacific Ocean where typhoons are originated. This vulnerability is intensified by the current socioeconomic condition of the communities and the poor local governance of the municipality in disaster preparedness and climate risk reduction in farming and fishing. From the evaluation of the LGU's programs and initiatives, DRRM and CCA in agriculture and fishery sector is of low priority in the local government unit's policy and planning. Based from the review of the Annual Investment Plan (AIP), Development Plan and the Local Disaster Risk Reduction and Management Plan of the LGU, these reveal that there are few or no programs mainstreamed in the plan. Programs and activities for disaster risk reduction and climate change adaptation in agricultural and fishery sector is very minimal, some were not implemented due to lack of personnel to initiate and lobby the program. Furthermore, the Comprehensive Land Use Plan of the municipality is not updated.

The findings of the primary and secondary data analysis in the context of the DRR and CCA issues in agriculture and fishery in the municipality are presented below:

- Low priority to DRRM and CCA in agriculture and fishery - The DRRM and CCA in agriculture and fishery is of low priority in LGU's policy and planning. No document in LGU is available that speaks about this strategic issue.
- No rehabilitation program being implemented after any type of disaster i.e. distribution of certified seeds to affected farmers, distribution of fishing paraphernalia to support marginalized fisher folks. The LGU relied only from the rehabilitation program of the Department of Agriculture Regional Office and Bureau of Fishery for distribution of fishing paraphernalia, i.e. gill nets and seaweeds implements, which are accessible only to those municipalities able to submit damage report.
- Poor capacity of LGU staff in DRR and CCA - The LGU staff responsible for agriculture and fishery development and its extension are not well equipped with DRR and CCA techniques.
- Less importance given to DRR and CCA Technical issues - The technical issues for DRR and CCA i.e. saline water intrusion, soil conservation, etc. are less priority issues.
- No early warning system and weather forecasting - There is no early warning/weather forecast system in the municipality that is why the municipality cannot provide short, medium and long-range forecast. There is no established cropping calendar that can be used by the farmers.
- No hazard mapping in every barangay to relocate farms located at the most disaster-prone areas.
- Poor loan facilities - farmers and fisher folks seek loans from individual who charge high interest, almost 40%, some rendered loan from ASA Phils with 15% interest and ARDCI with 40% interest.
- Weak knowledge dissemination system - The information flow is not very smooth, and the farmers do not get much information about the new researches/developments in the agriculture and fishery field.
- No disaster preparedness - There is rarely any preparedness to meet the emergency situation i.e. stocking for seeds. There are no storage facilities for keeping such stocks i.e. warehouses etc. There is no cropping calendar to anticipate climatic events that can destroy their crops.
- Negligible alternative livelihood resource - The alternative livelihood resources are not sufficient to compensate the livelihood loss due to disasters. There is not much enthusiasm in the government or NGO sectors to develop such resources. The farmers do not get good guidance or resources to start/develop such income generating small enterprises at local level.
- Information gap for marketing - There is not much information available to the farmers about marketing trend and demand, so that they may diversify their product. Sometimes, this makes farmers unable to get right value of their products.
- Poor coordination - Proper coordination among various stakeholders, especially in the agriculture and fishery sector is lacking. The sharing of information is very minimal, causing gaps in knowledge sharing and using available knowledge for appropriate DRR and CCA planning.
- Lack of clear cut policy about insurance - Lack of clear cut policy about insurance in the agriculture sector and less enthusiasm among the farmers to use the facility. The guidelines for the insurance in agriculture are not very clear and different groups have different information. It is not clear to the farmers on, how to make maximum benefit from the PCIC.
- Poor knowledge dissemination for DRR and CCA issues - The extension service for agriculture and fishery is not mainly provided through LGUs, they are less equipped to disseminate the DRR and CCA knowledge to the community.

The study further concludes that the experiences of the communities on climate change are real and the impacts are perceived. They noted that these unusual changes to their environment make them more vulnerable and they experience more strong typhoons, longer drought and unexpected and more frequent heavy rainfall that result to urban and coastal flooding. The changes seriously affect their livelihood systems, reason for more food shortage in marginalized families. These phenomenon commensurate with the following related studies: Robert J. Nicholls, in Coastal and Marine Hazards, Risks, and Disasters, 2015; Ian Allison, Frank Paul, in Snow and Ice-Related Hazards, Risks and Disasters, 2015; Ayyam Velmurugan, John Mathai, in Biodiversity and Climate Change Adaptation in Tropical Islands, 2008; Robert J. Nicholls, in Coastal and Marine Hazards, Risks, and Disasters, 2015; Roland Gehrels, in Climate Change (Second Edition), 2016; Kevin J. Noone, in Managing Ocean Environments in a Changing Climate, 2013 Impacts of Sea-Level Rise; Roland Gehrels, in Climate Change, 2009.

The statement and experiences of the respondents about the climate, rainfall, prevailing winds and temperature coincides with the result gathered in PAGASA and satellite data.

The following are the delimitation of this study which are significant in strengthening the capacities for disaster preparedness and climate risk reduction management: (1) The study used limited number of barangays to cover a more reliable information; (2) The socioeconomic condition of the farmers and fisher folks was not given emphasis in this study; (3) Geographical hazard mapping which is very important in planning to minimize and avoid hazard in farming and fishing; (4) The condition of marine and coastal resources that has an implication with the climate change impact; (5) The importance of mangrove in climate change mitigation and livelihood of the fisher folks; (6) The effect of climate change in the coastal communities; (7) The good practice options in agriculture and fishery adaptable to changing climatic condition.

Recommendations

On the basis of findings, plan of action in matrix form is formulated to guide the LGU in strengthening the capacities for disaster preparedness and climate risk reduction and management. The plan must be incorporation in the Comprehensive Development Plan (CDP) and Comprehensive Land Used Plan (CLUP). The local government unit must formulate Local Climate Change Action Plan (LCCAP) and implement the plan thereof. It is also a need to mainstream, institutionalize and integrate the concepts of DRR and CCA in the Comprehensive Development Plan - Legislative and Executive Agenda (CDP-ELA), Comprehensive Land Use Plan (CLUP) and Local Contingency Plan (LCP) and allocate fund through a resolution or ordinance to ensure implementation of the programs. It is also being recommended for the LGU to conduct the Climate and Disaster Risk Assessment (CDRA) to have a scientific based data at hand as reference for the formulation of the LCCAP. The LGU must adopt the recommendation per priority area for DRR in agriculture.

It is also recommended that a meeting with the Local Chief Executive and other stakeholders concerning this matter must be organized to present and discuss the findings and recommendations generated in this study. Thus, the LGU can take necessary action to adopt, mainstream and implement the plans, programs and activities in strengthening the capacities of the LGU for disaster preparedness and climate risk reduction and management in farming and fishing sector.

Further recommendation for the next studies to include the remaining 20 barangays to cover more reliable information, study deeply about the socioeconomic condition of farmers and fisher folks, include geographical hazard mapping, study about the ridge to reef condition that has an implication with the climate change impacts, the effect of climate change in the coastal communities, the good practice options in agriculture and fishery adaptable to the changing climatic condition.

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Aid and Accountability: The State's Obligation To Ensure Transparency and Accountability as to International Disaster Aid and Assistance

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Abstract

Basic Statement of the Issue - This study delves into the role of foreign assistance with respect to disaster management in the Philippines and scrutinizes the existing mechanisms and processes instituted by the Philippine Government with respect to the handling of foreign aid. It will show that disaster aid transparency and accountability is not institutionalized in the Philippine legal system and that such lack of transparency and accountability has had the resultant effect of seriously hindering the effective and efficient management of disaster relief, recovery, and rehabilitation efforts in the Philippines. The study then aims to establish that the institutionalization of foreign disaster aid transparency and accountability measures is a State obligation under the 1987 Constitution of the Philippines and under the international law obligations of the Philippines. Lastly, the study aims to propose a legislative measure creating a legal framework that will remedy the problem plaguing status quo, ensuring that the Philippines will comply with its obligation to exact transparency and accountability with respect to foreign humanitarian aid.

Hypothesis – A comprehensive survey of existing disaster relief, mitigation, and rehabilitation laws and procedures in the Philippines reveals that there are no legal mechanisms directing the State to impose transparency and accountability measures as to the handling of foreign aid. This severe lack of transparency and accountability measures in the Philippine legal system has led to the serious mismanagement of disaster aid, relief, and rehabilitation efforts. Further, upon exhaustive review of the 1987 Constitution of the Philippines, local jurisprudence, and the Philippines' international law obligations, the Philippine Government's failure to adopt transparency and accountability measures as to foreign and assistance can be deemed an infringement of its legal obligation to uphold the right of the Filipino people to obtain access to information on matters of public concern. As the situation presented in status quo subverts the mandate of the Philippine Constitution and the various international commitments made by the Philippines with respect to ensuring transparency and accountability as to matters of great public interest, a legal framework must be introduced, making sure that the timely collation and publication of relevant information on foreign aid and assistance are institutionalized in the Philippine legal framework.

Methodology - In order to enable one to have a clear and thorough understanding of international disaster aid and assistance, this study will involve a survey of historical and economic data, case studies, and dissertations on the concept and nature of foreign aid and assistance. Furthermore, the study will examine Philippine constitutional provisions, deliberations of the 1986 Constitutional Commission, several Philippine statutes, current government policies adopted by certain State agencies, jurisprudence, and treaties and other international agreements signed and ratified by the Philippines. The study also includes certain interviews and interactions conducted with several government agencies, revealing the incessant and recurring problem of lack of transparency and accountability in disaster aid. Lastly, the study includes a draft legislative bill that may be proposed to the Congress of the Philippines to remedy the problem posed by the study.

The analytical framework utilized in conducting the study is the Right-Duty Relations framework of Wesley Newcomb Hohfeld, which views legal rights and duties as jural correlatives – whenever a legal right exists, there is a correlative legal duty that likewise exists to protect and safeguard such right, and vice versa. The study endeavors to examine whether or not positive law (sourced from the Constitution and international law) grants the Filipino people the right to information with respect to disaster aid, hence, correlatively establishing a corresponding duty on the part of the State to uphold, recognize, and protect such right.

Scope and Limitations of the Study – The scope of this study is limited to aid, assistance, and donations in the form of cash, kind, or service in times of natural or man-made disasters and calamities that are coursed through the Philippine government, channelled through the various government agencies and instrumentalities, as well as local government units. Disaster relief aid and assistance extended through private organizations, institutions, and individuals are beyond the scope of this study. In addition, loan agreements and funds coursed through the Official Development Assistance (ODA) mechanism will not be included in this study.

I. The Great Vulnerability of the Philippines as to Natural Calamities and Disasters

The significance of undertaking an extensive scrutiny on the manner by which the Philippines manages information on foreign disaster aid and assistance is grounded on the grim reality that the Philippines is one of the countries which are most susceptible to debilitating natural calamities. Within the years 2010 to 2013 alone, there had been 80 recorded occurrences of natural disasters that beset the Philippines. The World Risk Index, created in 2012 by the United Nations University Institute of Environment and Human Security (UNU-EHS), found that the Philippines is the third most disaster-prone country in the world, being heavily exposed to natural disasters brought about by climate change.

Noting the critical need for the country to be disaster-ready in the face of impending calamities, the Philippine Commission on Audit (COA), the body mandated by the 1987 Philippine Constitution to examine the spending of public funds, made a critical assessment of the disaster management practices observed in the Philippines, in light of the widespread devastation caused by Typhoon Haiyan (locally named Yolanda), which ended thousands of lives and decimated several cities across the Visayas Region. The COA, in discussing the financial constrains with respect to disaster relief and mitigation, deemed that "the national budget continues to lag behind, still unable to meet the country's many competing needs. The composition of government expenditures … leaves little room for flexibility to allow a bigger impact on disaster spending." Hence, international aid and assistance plays a highly significant role in disaster management efforts in the Philippines.

II. The Philippines and Foreign Aid

Being a developing country highly vulnerable to disasters and calamities, the Philippines has historically been one of the largest recipients of foreign aid. Since 1946, the Philippine has been a recipient of substantial foreign assistance from bilateral and multilateral donors. Foreign donors' offer of assistance to Philippine Government are mainly given in the form of deployment of search-and-rescue teams and medical personnel, provision of relief goods, such as food, water, tents, and blankets, provision of medical supplies and vaccine, deployment of ships and aircrafts, and cash donations. The impact of foreign aid with respect to alleviating the destructive effects of natural calamities in the Philippines was greatly apparent in the aftermath of Typhoon Yolanda. According to official government figures, the Philippines has received a total of P14,997,132,777.47 of foreign aid for reconstruction and recovery efforts from the damage caused by Typhoon Yolanda.

The Existing Legal Framework: Republic Act No. 10121 or the Philippine Disaster Risk Reduction Management (PDRRM) Act of 2010

Bearing in mind the great need to ensure that country is well prepared for the eventuality of any calamity and disaster, in 2010, the Congress of the Philippines enacted Republic Act No. 10121 or the Philippine Disaster Risk Reduction Management (PDRRM) Act of 2010.

The law transformed the National Disaster Coordinating Council (NDCC) to the National Disaster Risk Reduction and Management Council (NDRRMC), headed by the Department of National Defense (DND), with the cooperation of the Secretary of the Department of Science and Technology (DOST) for disaster prevention and mitigation; the Secretary of the Department of the Interior and Local Government (DILG) for disaster preparedness; the Secretary of the Department of Social Welfare and Development (DSWD) for disaster response; and the Director General of the National Economic and Development Authority (NEDA) for disaster rehabilitation and recovery.

The NDRRMC is the body "empowered to perform policy-making, coordination, integration and supervisory functions, as well as monitor the preparation, implementation and evaluation of the National DRRM Plan (NDRRMP) to ensure the protection and welfare of the people in times of disaster." Under the status quo, the Department of Foreign Affairs (DFA) is the main agency of the State that deals with the acceptance of aid and assistance from various governments, international organizations, and other foreign entities, with the coordination of the Office of Civil Defense (OCD) and the NDRRMC.

III. The Clandestine Management of Foreign Aid: The Problem in Status Quo

Under the existing Philippine legal system, there is no provision of law mandating government agencies handling foreign disaster aid donated to the national government or any of its instrumentalities to disclose and grant public access, in a timely and comprehensible manner, relevant information on the amount, the target beneficiaries, and the current status of disaster aid. Moreover, there are no punitive measures penalizing responsible public officers in the event that they fail to observe transparency and proper accountability as regards foreign disaster relief aid and assistance. The mandatory publication of and granting public access to information on foreign disaster aid are not provided under Republic Act No. 10121, nor in any other statute. With the non-existence of any legal mechanism mandating foreign disaster aid transparency, as well as accountability measures exacting responsibility from liable public officers, **the status quo readily permits concerned government agencies to abuse and misuse their inherent discretionary power over the control of information access. The concomitant result is the current legal framework's perpetuation of the routine violation and disregard of a basic and fundamental right granted to every Filipino – the right to information on matters of public concern**.

The COA itself recognizes the glaring absence of transparency and accountability as to foreign disaster aid and its sweeping ramifications in the country's disaster risk reduction and management efforts. In noting that the tracking of disaster aid information is tremendously strenuous due to the lack of publicly available information, COA asserted that "[i]t is … difficult to measure the efficiency and effectiveness of government response to disasters. The lack of a system that tracks what commodities and services have been delivered to the people also makes it hard to draw the lines of accountability." In 2014, COA released a report on the special audit of Typhoon Yolanda relief operations. In its analysis of the established system of handling aid in the Philippines, the Commission noted the great need to introduce transparency and accountability measures that will guarantee the citizenry's access to aid information, ensuring that relief goods and other donations are effectively and efficiently delivered. The COA recommended that "the concerned agencies [should] revisit the existing relief operations system and adopt measures to ensure the smooth flow of procedures and regular reporting to provide information to management and other stakeholders for decision making and monitoring purposes. Moreover, the agencies must establish an efficient feedback mechanism that would pinpoint responsibility and enhance accountability and transparency in the relief operation process." (Emphasis supplied)

Moreover, the same report noted that the systems adopted by concerned government agencies with respect to relief distribution operations, such as the DSWD field offices, **"did not provide daily and periodic reporting on the results/ status of its operations as well as accounting of funds received and its utilization."** (Emphasis supplied) Lapses in the documentation and recording of donated cash/relief goods and supplies "were sometimes moved from warehouses without the accompanying approved supporting documents. There are also discrepancies between the accounting and reporting of family food packs (FFPs) between warehouse personnel and DSWD employees." All in all, the COA determined that there is an extreme necessity "to look into the problematic areas and aspects where the government came up short or had no response at all, especially in the fundamental elements of leadership, capabilities and accountability."

An investigation on the management of disaster relief relating to Typhoon Yolanda conducted by a Philippine Senate panel headed by Philippine Senator Francis Escudero concurred with the findings of COA. **The panel report asserted that there was an absence of any law "instituting a mechanism for the receipt, accounting, and monitoring of foreign and local donations by the government for various calamities that plague the country."** (Emphasis supplied) The Senate panel found out that "there was no single agency in the government that has possession and knowledge of the total amount of local and foreign donations for the victims of Typhoon Yolanda."

Actual Denial of Requests for Information by Several Government Agencies

To illustrate how the situation in status quo leads the State to renege on its obligation to ensure transparency and accountability as to public matters, including critical and relevant information on international humanitarian aid and assistance, the Philippine Center for Investigative Journalism (PCIJ) conducted a study in 2009 on the ability of the public to gain access as to information on matters involving public interest. The said PCIJ study confirmed that **"the absence of an enabling law has apparently enabled various government agencies and officials … to violate [the public's right to information]."** The PCIJ study revealed how, despite the existence of the constitutional right to information, many government agencies remain to be "stuck in confidentiality mode and require prodding and coaxing to release documents. The most hostile, in fact, simply flatly deny or altogether ignore requests for public documents." At least 14 cases of requests for information were denied by 12 different government agencies, "with the reasons ranging from the condescending to the incredulous."

An examination of the current state of government agencies' policy on the granting of public access to information, through actual attempts to coordinate with government bodies, produced alarming results, revealing **"an alarming reluctance by government agencies to allow public access to documents and information for other reasons** – especially if the data may prove unflattering to the agencies concerned." Requests by ordinary citizens for information from government agencies were met with "flimsy reasons for refusing access to documents; most of the time, the agencies didn't even bother to give any reason at all." For such reasons, the State's constitutional obligation to respect and uphold the people's right to information on matters of great public interest, which includes information on international disaster aid, is reneged, without a clear and well-defined legislative measure on foreign aid transparency and accountability mechanisms.

The Grave Consequences of Lack of Transparency and Accountability

What then are the repercussions of the lack of transparency and accountability in the capacity of foreign aid to provide efficient and effective relief and assistance to the persons and communities affected by calamities? The State's failure to adopt a strong policy on aid transparency and accountability seriously undermines the capability of foreign assistance to augment the recovery efforts and economic rehabilitation of developing countries stricken by disasters. It is maintained by the COA that "[f]ollowing a catastrophic disaster, decision-makers face a tension between the demand for rapid response and recovery assistance— including assistance to victims—and at the same time, implementing appropriate controls and accountability mechanisms." However, transparency measures cannot be sidestepped **as "[a]ccountability controls and mechanisms ensure that resources are used appropriately for valid purposes."** (Emphasis supplied)

According to a study conducted by the United States Congressional Budget Office on international humanitarian assistance, entitled The Role of Foreign Aid in Development, foreign aid may either promote or hinder development, depending on the environment in which aid is used and the conditions under which it is given. According to the same study, **"aid given to countries that have been governed poorly [as to disaster aid management] … is less likely to make a positive contribution to their development."** (Emphasis supplied) The lack of publicly available information with respect to how much aid from external sources is bestowed to a disaster-stricken country "undermines macro-planning and stability thus affecting exchange rates, monetary supply and fiscal policy, potentially making poverty reduction harder to achieve."

IV. The State Obligation to Account for Foreign Aid: Foreign Aid as Public Funds

A. The Constitutional Underpinnings of Foreign Aid Transparency and Accountability

The 1987 Constitution lays the foundation for the imposition of an obligation upon the State to adopt transparency and accountability measures as regards its management of public funds, which indubitably includes foreign disaster aid granted through State instrumentalities.

The right of the people to obtain vital information on public matters is a clear constitutional imperative. Under Article II, Section 27 of the Constitution, it is the policy of the State "to maintain honesty and integrity in the public service and take positive and effective measures against graft and corruption." Article II, Section 28 states that **"[s]ubject to reasonable conditions prescribed by law, the State adopts and implements a policy of full public disclosure of all its transactions involving public interest."** (Emphasis supplied) Furthermore, under Article III, Section 7, **"[t]he right of the people to information on matters of public concern shall be recognized**. Access to official records, and to documents and papers pertaining to official acts, transactions, or decisions, as well as to government research data used as basis for policy development, shall be afforded the citizen, subject to such limitations as may be provided by law." (Emphasis supplied) Moreover, under Article XI, Section 1, "[p]ublic office is a public trust. Public officers and employees must, at all times, be accountable to the people, serve them with utmost responsibility, integrity, loyalty, and efficiency; act with patriotism and justice, and lead modest lives."

The State's obligation to ensure transparency and accountability regarding international disaster aid and assistance stems from the constitutional right of the people to possess information on matters of public concern. In recognizing the indispensability of an informed citizenry in any thriving democracy, the 1987 Constitution bestows upon the people the right to information. Being an enshrined constitutional right, the State is obliged to preserve and uphold such right. This was explained in no uncertain terms by the Philippine Supreme Court in the landmark case of Chavez v. NHA. In the aforementioned case, the Supreme Court explained that the right to information is composed of – (1) **the governmental "duty to disclose information"** and (2) **the governmental "duty to permit access to information."**

According to noted Filipino constitutionalist and framer of the Philippine Constitution, Fr. Joaquin G. Bernas, S.J., Section 7 of the Bill of Rights guarantees "the right to information on matters of public concern," and "the corollary right of access to official records and documents." Fr. Bernas adds that the term "public concern" embraces "a broad spectrum of subjects which the public may want to know, either because these directly affect their lives or simply because such matters arouse the interest of an ordinary citizen."

In another landmark case involving the right to information, Legaspi v. Civil Service Commission, the Supreme Court emphasized that "[f]or every right of the people recognized as fundamental, **there lies a corresponding duty on the part of those who govern, to respect and protect that right. That is the very essence of the Bill of Rights in a constitutional regime."**

As further explained by the Supreme Court in another case, i.e., Baldoza v. Dimaano, the right to information on matters of public concern enshrined in the Bill of Rights "is a recognition of the fundamental role of free exchange of information in a democracy. There can be no realistic perception by the public of the nation's problems, nor a meaningful democratic decision making if they are denied access to information of general interest. Information is needed to enable the members of society to cope with the exigencies of the times." (Emphasis supplied)

A more extensive discussion on the Philippine Constitution provisions on the constitutional right to information through the deliberations of the 1986 Constitutional Commission, as well as a brief survey of Philippine jurisprudence on the matter is attached herewith as **Annex A**.

B. The International Law Underpinnings of Foreign Aid Transparency and Accountability

Furthermore, the advocacy of ensuring transparency and accountability in disaster aid has also emerged as an international trend and is widely recognized as an obligation that should be observed by States under international law. The right of citizens to actively participate and be involved in the governance of public funds and the right to acquire information on matters of great public interest are contained in various international instruments signed by the Philippines, such as the Universal Declaration of Human Rights (UDHR), the International Covenant on Economic, Social and Cultural Rights (ICESCR), and the International Covenant on Civil and Political Rights (ICCPR).

Article 19, Paragraph 2 of the ICCPR echoes the UDHR's provision on the right to information, stating that "[e]veryone shall have the right to freedom of expression; this right shall include freedom to seek, receive and impart information and ideas of all kinds, regardless of frontiers, either orally, in writing or in print, in the form of art, or through any other media of his choice." (Emphasis supplied) The aforementioned provision of the ICCPR embraces **a right of access to information held by public bodies**. Such information includes records held by a public body, regardless of the form in which the information is stored, its source and the date of production … the right of access to information includes a right whereby the media has access to information on public affairs and the right of the general public to receive media output. (Emphasis supplied)

The U.N. Special Rapporteur on Freedom of Opinion and Expression, Mr. Abid Hussain, in delving into the obligation of governments to observe the right of its citizens to have open access to information on public matters, stressed that the right to information "imposes a positive obligation on States to ensure access to information, particularly with regard to information held by Government in all types of storage and retrieval systems[.]" Furthermore, the U.N. Special Rapporteur on Freedom of Expression of the Organization of American States asserts that **"[t]he right to access information held by public authorities is a fundamental human right which should be given effect at the national level through comprehensive legislation** (for example Freedom of Information Acts) based on the principle of maximum disclosure, establishing a presumption that all information is accessible subject only to a narrow system of exceptions." (Emphasis supplied)

Touching specifically on how the lack of transparency and the proliferation of corrupt practices dissuade foreign donors from contributing disaster aid and assistance, the United Nations Convention Against Corruption (UNCAC), signed by the Philippines in 2004, recognizes that "[c]orruption hurts the poor disproportionately by diverting funds intended for development, undermining a Government's ability to provide basic services, feeding inequality and injustice and discouraging foreign aid and investment." The UNCAC also obligates State parties to "take appropriate measures ... to promote the active participation of individuals and groups outside the public sector … by such measures as: **[e]nhancing the transparency of and promoting the contribution of the public to decision-making processes; [e]nsuring that the public has effective access to information[.]"** (Emphasis supplied)

In 2005, the Philippines signed an international instrument called the Paris Declaration on Aid Effectiveness, which mandates signatory countries and donors "to enhance mutual accountability and transparency in the use of development resources." In addition, the Accra Agenda for Action, signed by the Philippines in 2008, "recognizes that greater transparency and accountability for the use of development resources—domestic as well as external—are powerful drivers of progress." Increased coordination between the various sources of information, including national statistical systems, budgeting, planning, monitoring and country-led evaluations of policy performance, are required to be observed by State Parties. In addition, donors are mandated to align their monitoring with country information systems.

Another international document signed by the Philippine government in 2011, the Busan Partnership for Effective Development Co-operation, implements a unitary standard for the publication of "timely, comprehensive, and forward-looking information on resources … taking into account the statistical reporting of the OECD-DAC and the complementary efforts of the International Aid Transparency Initiative and others. This standard must meet the information needs of developing countries and non-state actors, consistent with national requirements." State Parties to the Geneva Convention and the International Red Cross Red Crescent Movement, including the Philippines, adopted the guidelines on International Disaster Response Laws Guidelines, obligating State Parties to ensure "in a transparent manner, [the] sharing [of] appropriate information on activities and funding." This mandate was further stressed when the United Nations General Assembly adopted U.N. Resolutions 63/139, 63/141, and 63/137.

The emergence of various international movements and organizations advocating for aid transparency and accountability, such as the International Aid Transparency Initiative (IATI) and the Global Campaign for Aid Transparency, as well as data collection and publication initiatives being introduced by the U.N. and the Organization for Economic Cooperation and Development (OECD) show that there is an emerging global trend in the international community calling for the imposition of transparency and accountability measures with respect to the management of disaster aid information. A more extensive discussion on the international law obligations of the Philippines regarding aid transparency is attached herewith as **Annex B**.

V. Strengthening the Philippine Legal Framework: Recommendations to Address the Problem

A. The Proposed Foreign Aid and Assistance Transparency and Accountability Act Of 2018

As concluded by the findings of the COA special audit, the Senate panel which undertook a careful scrutiny of Typhoon Yolanda relief operations, and the NEDA report on the adherence of the Philippines to the Paris Declaration, for the State to truly adhere to its obligation under the Philippine Constitution and under international law to ensure transparency and accountability as to foreign disaster aid and, a legislative measure which will institutionalize aid transparency and accountability mechanisms in the disaster management system should be enacted. In order to ensure that the government will abide by its commitment to ensure aid transparency and accountability, the proponent puts forward a proposed legislative measure that mandates concerned government agencies to both proactively release and grant public access to relevant information on foreign disaster aid and assistance, which should be timely released through readily accessible and reachable mechanisms in an easily comprehensible format.

This legislative measure is largely modeled after an unfiled Senate Bill, Senate Bill No. 2342, introduced by Philippine Senator Francis Escudero, entitled *"An Act Mandating The Full Accounting Of All Disaster-Relief Aid Or Donations Received By The Philippine Government For Natural And Human-induced Calamities."* Some parts of the proposed legislative measure are also patterned after R.A. No. 10121 or the Philippine Disaster Risk Reduction and Management Act of 2010. The proposed legislative measure is entitled *"An Act Mandating Transparency And Accountability As To Disaster-Relief Aid Or Donations Received By The Philippine Government From The International Community For Natural And Human-induced Calamities." Such act shall be known as the "Foreign Aid and Assistance Transparency and Accountability."* A draft version of the proposed legislative measure is found on the attached **Annex C**.

B. Institutionalization of Disaster Aid Transparency and Accountability through an Amendment of the

The Philippine Congress is currently in the process of reviewing the existing disaster management law, i.e., Republic Act No. 10121. There are certain draft legislative proposals being considered by Congress calling for the creation of an entirely separate department under the Executive dedicated to disaster management, such as Senate Bill No. 1735, and House Bill No. 6075. While these bills are laudable in their objective of further strengthening the Philippines' capability to manage disasters, as well as streamlining government bureaucracy in order to more effectively and efficiently manage disasters, a perusal of these draft legislative measures reveals that disaster aid transparency and accountability measures are still not introduced and prioritized under the said proposals.

Hence, it is recommended that any amendment to Republic Act No. 10121 should include explicit provisions that mandate concerned government agencies to both proactively release and grant requests from the public access to relevant information on foreign disaster aid and assistance, which should be timely released through readily accessible and reachable mechanisms in an easily comprehensible format.

C. The Passage of The Freedom of Information Law

Another undertaking that can address the present failure of the State to comply with its obligation under the Constitution and under international law to ensure foreign aid transparency and accountability is the immediate passage of the Freedom of Information Law (FOI Law). The Freedom of Information Law ensures that the State will fully recognize the right of the people to information on matters of public concern by providing clear and specific procedures, guidelines, limitations, and penalties on the implementation of "a policy of full public disclosure of all its transactions involving public interest[.]" The FOI Law guarantees that the citizenry will have a "significant and widening role … in governmental decision-making as well as in checking abuse in government." Under the FOI Law, "[p]ublic officials and employees, in the performance of their duties under this Act … shall endeavor to handle information kept or obtained under this Act with due care, to the end that inaccuracies and distortions are avoided."

On March 10, 2014, the Senate passed Senate Bill No. 1733 or the "People's Freedom of Information Act of 2013" on third and final reading, with Philippine Senator Grace Poe as principal sponsor. The FOI Act of 2013 makes certain that the citizenry will have access as to critical information on foreign aid and assistance granted to the government in times of natural and man-made disasters and calamities, as Section 5 of the proposed law recognizes that "[e]very Filipino citizen has a right to and shall, on request, be given access to any record under the control of a government agency regardless of the physical form or format in which they are contained[.]" Section 9, on one hand, mandates each government agency to "regularly publish, print and disseminate at no cost to the public and in an accessible form, consistent with the provisions of Republic Act No. 9485, or the Anti-Red Tape Act of 2007, and through their website, timely, true, accurate and updated key information[.]" On the other hand, Section 12 recognizes that with respect to information on matters of public concern, which includes information on disaster aid and assistance from foreign sources, "[a]ny person who wishes to obtain [such] information [can] submit, free of charge, a request to the government agency concerned personally, by mail, or through electronic means."

VI. Conclusion

With disasters and calamities seen to inevitably and recurrently pummel the Philippines and considering the inadequacy of State resources in sufficiently addressing the country's disaster management needs, international disaster aid and assistance assume a crucial role in disaster mitigation, relief, and rehabilitation.

The very animus behind the granting, storage, and distribution of foreign disaster aid is the lending of much-needed help and assistance to calamity-stricken victims and destroyed communities. Foreign aid and assistance directly affect the lives of the Filipino people - a resilient people that continually face the menacing threat of calamities and disasters.

Furthermore, Philippine law treats international humanitarian assistance coursed through State instrumentalities as public funds, being part and parcel of the people's money. For those reasons, critical information on foreign disaster aid and assistance are incontrovertibly impressed with great public interest, being a matter of grave public concern. The right of the people to obtain access to information on matters of public concern and the correlative obligation of the State to uphold and defend such right are firmly enshrined in the fundamental law of the land - the 1987 Constitution.

Moreover, the Philippines has obligated itself to institute transparency and accountability measures in the acceptance, storage, and distribution of international disaster aid by being a signatory to various international conventions and documents - the Universal Declaration of Human Rights (UDHR), the International Covenant on Economic, Social and Cultural Rights (ICESCR), the International Covenant on Civil and Political Rights (ICCPR), the Paris Declaration on Aid Effectiveness, the Accra Agenda for Action, the Busan Partnership for Effective Development Co-operation, and the United Nations Convention Against Corruption (UNCAC). By adhering to the established principle of pacta sunt servanda, the Philippines has made the solemn vow of ensuring that the obligations made under such international agreements shall be realized.

As the situation presented in status quo subverts the mandate of the Philippine Constitution and the various international commitments made by the Philippines with respect to ensuring transparency and accountability as to matters of great public interest, a legal framework must be introduced, making sure that the timely collation and publication of relevant information on foreign aid and assistance are institutionalized under law. By institutionalizing, through means of legislation, international disaster aid transparency and accountability, the Philippine's obligations under international law and under its own Constitution will not be undermined and will be duly subscribed to. With the State's fulfillment of its obligation to account for disaster aid, the end result can only be the true and concrete advancement of the democratic and republican ideals held dear by the Filipino nation's Constitution – that the sovereignty of the State truly emanates from the people.

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Quakequest Board Game: From Chiangrai Earthquake Lesson Learnt Towards the Disaster Education

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Abstract

This article aims to review the active learning tool for disaster education named "Quakequest Board Game" created from the researcher's experiences in Chiangrai Earthquake using the KAP model (Rogers, E. M., 1995) where knowledge, attitude, and practice are the framework of game construction. The "Quakequest Board Game" is a table-top board game that directs learners to play the role of chief executive of the Sub-district Administrative Organization (SAO), whose responsibilities are to respond and cope with disaster risk. The game was constructed as follows. 1) The knowledge of disaster risk assessment was transferred while the players considered the situation and minimized the disaster risks. 2) The attitude of the collaboration was built while they communicated and negotiated for the resources. 3) The practice of resource allocation would adjust their reciprocal sharing behavior under the condition of limited resources. The research question is: "How can we make appropriate tools for experience transfer in disaster risk reduction?" The testing results from the youth activists' incubation of the ThaiHealth Fund showed that this game would enhance the understanding of disaster risk reduction and the attitude of resource-sharing. During the after-action review (AAR), it was revealed that the risk assessment knowledge was transferred, the sharing behavior was improved, and there was more emphasis on collaboration. However, the limitation of the table-top board game is the level of facilitation skills available, because the game requires game masters to run scenarios and induce the players to reflect their actions and perspectives. In conclusion, it seems this game can be an effective tool of disaster education, which enhances knowledge on earthquakes, the resource allocation skill and the collaboration attitude through active learning.

Keywords: Disaster Education, Chiangrai Earthquake, Board Game

Introduction

While many disaster management technologies have been developed to increase the efficiency in warning people of the disaster, the risk reduction from human errors and misjudgment could still be improved, especially with respect to the risk assessment knowledge, resources-sharing behavior and collaboration attitude. These qualifications would need to be developed because a warning will be useless if people do not know what to do during the emergency. Absornsuda, S. (2008) wrote that disaster education is part of awareness and preparedness, which is the least expensive and most efficient way for disaster mitigation. Even without sophisticated and expensive technologies for early warning, the people can still survive and mitigate the impact of natural disasters safely if they know the characteristics of the disasters scientifically. However, the current disaster education models tend to emphasize only on the aspect of knowledge while ignoring attitude and practice.

Formal education can enhance cognitive ability, information processing and learning skills, so that individuals with higher education could respond better in difficult times such as when a disaster strikes. Muttarak, R., and W. Pothisiri. (2013) stated that disaster education can enhance personal preparedness, which is crucial in mitigating disaster risks. However, the effectiveness of such education might be limited only to some groups of the population such as highly educated individuals. Thus, policies which ensure the universal access to formal education, at least at the secondary level, can be beneficial in reducing vulnerability and mitigating disaster impacts. Nevertheless, I found that there were three problems in disaster education from my activity-based teaching experience. **1) The lack of knowledge management (KM).** The knowledge mapping, categories or level of disaster management is not clear. Knowledge management of disasters must be categorized by the level of management, from individual level (self-organize), community level, sub-district level, provincial level, to national level. Moreover, most available information about disasters in Thailand is limited to just the definition and effects of disasters, as it is difficult to find content on how to deal with worst-case scenarios in practice. **2) The lack of local context integration in the course.** Scenario planning and experiences connected to the local context is often not applied into the course, so it could not effectively encourage learners to understand the relationship among actors. **3) The lack of the "tool" and "how to"**. It is hard to find content on how to survive by using self- reliant

strategies within the Thai context. I could not find any educational tools to develop the students' understanding of the overview of disaster management which connects the self-organizing concept to cope with disasters at the individual level.

As a result, it has been very interesting to create an educational tool which is the active learning tool for disaster education to promote knowledge sharing, positive attitude, as well as practice in the form of a game-like concept, to see whether learners who are meant to be key change agents of society on disaster management have improved their competency in dealing with disasters. It was expected that while studying disaster mitigation, learners would be given not only the knowledge from listening to lectures but also the problems, or sometimes they would set the tasks by themselves and solve them individually or through cooperating with other learners. (BRI and GRIPS., 2007). This is where the tool for activity-based education could be beneficial. The problems and expectations of ultimate outcomes mentioned above have inspired me to create the game named "QuakeQuest" as the tool for activity-based disaster education. This game was constructed by Gamification and KAP model to educate and improve attitudes of the learner. The research question is "how to make appropriate tools for experience transfer in disaster risk reduction". Its approach is similar to the action research of Yamori Katsuya (2009) who used the participatory game to build a "community of practice" through a gaming approach. His game introduced merely for form's sake and substantial interaction among diverse stakeholders towards the disaster risk governance, which contains the concept in the following.

Disaster Risk Governance

The concept of Disaster Risk Governance originated as the risk management protocol among the inter-organization involving the government officers, the private sectors, the civil society, and the mass media in the local, regional, and international level, especially the risk from disaster involving weather conditions. The protocol would enable the society to decide together and enhance the understanding, agreement, and the shared operation as well as unite the differences. The people could express their concerns and exercise their legal rights involving the disaster risk. (United Nations Development Programme, 2015)

Public Disaster Prevention and Mitigation Act, B.E. 2550 was employed, and the disaster management structure set up at the local level was the support unit for the provincial level and the responding unit in the area. The district chief (as well as assistant district officer) actually was the district director responsible for the operation in public disaster prevention and mitigation in each district. There were also local directors, whose responsibilities were preventing and mitigating disasters in their areas as well as supporting the provincial director and district director.

The focus of ACT is strengthening the management policy under the good governance, as well as encouraging the community and networks to participate in public disaster prevention and mitigation. The main point of encouraging civil society to be a part of disaster management is to give them the opportunity to participate in disaster management. Local directors would establish volunteers in the areas to support public disaster prevention and mitigation and assist the director as assigned.

I applied the Chiangrai earthquake's lesson learnt (Sirinon Suwanmolee, 2017) that focuses on control during a disaster. The local administrative organizations have allocated their resources or coordination by altruism during the emergency and recovery phase. Local communication was allowed as a method to contact the provincial offices to inform their needs and situational data and reflect problems. Thus, it let all involved partners see the whole possibilities and perspectives together for further coordination and immediate response. As a result, fewer command and controls in the system with more trusts and respect were expected among team members, together with respect for their own autonomy, self-organization, and possibility to empower internal members to be strong and ready for sharing information.

Because of during crisis, each organization must respond with different roles which change from dealing with the disaster and responding to a single situation into establishing short-term and long-term recovery process. This is done by adjusting their management policies to directly and indirectly agree with the national government, local government, private organizations, and private development organizations. The decentralization of authority is crucial in crisis management because the whole system of interaction during crisis requires an open mindset, in order to find best solutions and fill in gaps in inter-organizational coordination during the recovery phase.

Gamification

Deterding et al. (2011) stated that the term "Gamification" was applied by the digital industry. The first record of the use of this term was around 2008, but it was not widely employed until 2010. In general, gamification is the procedure of implementing designs and concepts of gaming into learning or training scenarios, with the hope to convince users and learners to engage more in learning or training while being entertained. This is due to today's educational approaches that believe in using game elements in learning environments to motivate students to learn. (Kapp, K.,2012, Shatz, I., 2015) The goal is to get the best out of the enjoyment and engagement through capturing the interest of learners and inspiring them to continue learning. (Huang, W. and Soman, D.,2013)

Gamification component

The reason gamification has been employed in this study as the educational active learning tool is that it gathers elements from existing examples of scientific knowledge, survival skills, disaster risk reduction and community-based disaster management, and integrates them with game dynamics, to increase learners' participation and engagement. Gamification has been accepted as a very beneficial approach to urge users to be exposed to challenges as it encourages their motivation and engagement. Lugmayr, A., Suhonen, J., Hlavacs, H., Montero, C., Suutinen, E., Sedano, C., (2016) mentioned that gamification's broad elements sharing qualifications of games helps to encourage players to have fun and thus impacts upon their behaviors. That is, games used for learning can be considered as serious games as players get the learning experiences that is positioned as the center of serious stories, impressive in quality and part of a thoughtful process to achieve learning goals. Kapp, K. (2012) explained the structure of gamification through the components of a game as follows:

1) **Goals.** All games need at least one goal as the ultimate objective to win each game, by succeeding in finishing each mission or pass the conditions game designers have set up to challenge the players to go forward. Occasionally, each goal can contain sub-goals in parallel to the main goal. When each player succeeds the main goal, the game will finally end.

2) **Rules.** Rules, regulations, manners, how to get marks, game rating must be informed in every game. They should be clearly explained to players for the complete understanding.

3) **Conflict, Competition and Cooperation.** The conflict game means the game is won by destroying or resisting antagonists, while the competition game means it is won by increasing the player's own performance against others. Both mentioned above differs from the cooperate game that needs players to coordinate with other players in order to win the obstacles and reach the goals together.

4) **Times.** Many games have rules that ask players to achieve the missions on time. This would drive the player to learn about time management and understand the factor of success in relation to the phase of the time.

5) **Reward.** When the goal of each game is accomplished, each player will receive marks as the reward. Therefore, rating or ranking is a key element that lead players to achieve more success presenting their higher performance.

6) **Feedback.** The review after each action would reflect the right or the wrong decision in the game. Each game must contain feedbacks as an important part to correct the wrong action, decision or the behavior of each player.

7) **Levels.** A good game should have different levels of challenges to convince players to develop their skills and experiences, as a higher level is more complicated or difficult than a lower one. Meanwhile, the steps of each level always force the player to keep playing onwards as ongoing challenges or obstacles can persuade the player to gather more experiences to reach a higher goal.

Steps of gamification development

As mentioned earlier, gamification is the process that assimilates game mechanics and education together. Players will get rewards in return, such as points, badges, and more difficult levels. These outcomes actually generate them to attain the goal of the game as well as the learning objectives. MacMeekin M. (2013) explained the six steps of the gamified development which can be described in the following:

1) Identify Learning Outcomes: Teachers must identify the desired learning outcomes and clarify learning indicators to the learners.

2) Choose a Big Idea: Teachers have to choose idea(s) to challenge learners and urge them to learn and apply gained knowledge to the applicable skill.

3) Storyboard the Game: Teachers must design scenarios as consequences of the game starting from the beginning to the end.

4) Design Learning Activities: As learning happens along running activities, teachers must design and put sequences and content into each activity. I have designed this disaster learning game by using the KAP model, which will be explained in the next topic.

5) Build Teams: Learners are expected to play as a team or individually. However, more social interaction is expected when they play in a team playing mode. If the activity is set as team playing mode, it may also encourage social interaction among players better than the individual playing mode.

6) Apply Game Dynamics: Teachers must verify the standard of gamification to have a good balance between motivation, level, competition, challenge, reward and feedback.

KAP model

The KAP model is a method to integrate disaster education to gamification. With the use of KAP model, I have designed several learning activities as the KAP model is constructed with knowledge, attitude, and practice, to develop the 'new skills, knowledge, understanding, and attitudes' (Rogers, E. M., 1995). The information and rules in this game were actually recognized as knowledge, while attitudes were a set of initial influences and the beliefs related to actions were formed. Practice referred to actions, as the existence of beliefs in oneself actually is the drive of each action.

While the game was being designed, one of the disaster gamification examples which motivate disaster mitigation were referred. Gianisse M.A., et al. (2014) made the game that focuses on disaster mitigation and preparedness processes within the community. The implementing concept of gamification within the proposed system would help people in the community to be motivated enough to participate in disaster-related activities that would reduce the casualty of disasters occurring in the environment. Likewise, my game was also developed by the similar components.

Component of Quakequest Board Game

Knowledge component

Disaster is defined as a serious disruption of the functioning of a community or a society causing widespread human, material, economic, or environmental losses that exceed the ability of the affected community or society to cope with by using its own resources. A disaster is a function of the risk process that results from the combination of hazards, conditions of vulnerability, and insufficient capacity or measures to reduce the potential negative consequences of risk (The United Nations Office for Disaster Risk Reduction, 2004). The players of this game might know the meaning and the disaster risk assessment equation (risk = hazard x vulnerability / capacity) because they have to reach the goal by lowering the risks and increasing the coping capacity. The goal is that every team must take at least some risks.

Secondly, the disaster management cycle is applied to set the game level. Thus, this game has three levels: the emergency phase, recovery phase and preparedness phase. Each level needs to deal with a different mission.

Thirdly, the knowledge of the disaster characteristic is formed by consideration of each situation when players must solve problems by communicating and negotiating to other Chief Executive SAO to deal with their hazard or vulnerability in order to allocate the resources. The disaster characteristics are transformed into keywords such as "non-linear", "chaos", "chain effect" and "escalation". This refers to the fact that small changes of the early event contain some major consequences. Dynamic interactions are consequently formed as a non-linear feedback system.

The game scenario would start as every sub-district is given a chance to use the budget of 1,000,000 Baht to get the resources or establish the disaster coping team. After receiving the budget, the provincial governor (game facilitator) would announce that a 6.3 magnitude earthquake has hit 3 sub-districts. The disaster severity is level 2, and the provincial governor has the authority to control the situation. Then, aftershocks of 5-4 Magnitude quakes could be found only in the early stage and unpredictable quakes of 2-3 Magnitude could be found for 1 year. Thus, damages from this hazard may have a wide reach or escalate the scenario.

Attitude component

Contextual empathy, sharing, selflessness and collaboration act as the attitudes that the players in this game must develop as gamification is a system with an effective tool to help raise the knowledge of a community on potential disasters. The use of collaborative techniques and information sharing through the interaction of a large number of people has been proved efficient in solving certain complex tasks (Horita, F. E. et al., 2014). Similarly, Doan et al. (2011) stated that the collaborative systems which employed a large number of people together to carry out various tasks for several purposes, exchange experiences with each other and tackle serious problems in a distributed way may build the collaborative attitude of the players.

Since this game has employed the role-play game (RPG) mechanic, the game players would play the role of the Chief Executive of the sub-district Administrative Organization (SAO) with different contexts and starting resources. Through the use of scenario planning, the players will be encouraged to assess the consequences of the disasters in their sub-districts. Learners are then persuaded to understand the relationship among actors. In particular, three sub-districts need to collaborate and control the disaster on the basis of their context altogether. Information must be shared, and resources must be managed through mutual selflessness at once. Thus, the attitude of selflessness is acquired whereas resource-sharing has started. On the other hand, reflection and adjustment are key elements projected to occur according to the lessons learnt together, with the mutual goal of better skills, better planning, and better operation that creatively change together.

The skills mentioned above are the experiences and the institutional mechanisms which I attempted to transform into the game. The players may learn and use the coordination skill and problem-solving skill from the earthquake situation gamified in the next topic.

Practice component

The practice of this game is risk assessment, situation command, resource allocation, and sharing. The players may manage the budget to prepare resources before each disaster strikes. Meanwhile, collaborative skills in inter-organization disaster management can happen while resources are under allocation.

The game ends with the preparedness phase as the game facilitator will create the after-action review. The players need to have the skill to analyze the risks and link their experience on disaster management with the game and reveal lessons learnt from the reflection. This game is expected to raise the understanding of disaster risk reduction and the attitude of resource allocation which in fact are the weaknesses of Thailand's disaster management.

According to the study of Lipnack, J. and Stamps, J. (1997), in general, the successful cases consisted of 90 percent of cultural openness and 10 percent of organizational flexibility and technical infrastructure. Indeed, the most desirable administrative system is bottom-up management because it can produce more of the community's capacity to restore all parts together despite the obstacles. There were also the reserve system and adaptation capacity when the risk is threatening, and uncertainty arises. This would reflect the importance of enhancing administration through adequate information, planning, and performance, which could lower the possibility of damages. Prevention is more preferred over the restoration. This is because when a disaster happens, and restoration is delayed, more losses are likely to increase when time passes, and the restoration and development will decrease.

Finding and Limitation

The researcher had tested this game with the target group, youth activists in disaster project manager incubation, The researcher had tested this game with the target group of youth activists in disaster project manager incubation, funded by ThaiHealth Fund. The results showed that the understanding of disaster risk reduction and the attitude of resource-sharing were ingrained in the target group's mindset.

The games could contribute to learning about practical and attitude-related components to improve disaster risk governance. When players did the after-action review (AAR) at the final phase, they felt the risk assessment knowledge was transferred through the scenario solving such as they have to borrow the rescue team from each other. They said the sharing behaviors were improved. Then when next turn happened (the next phase of disaster management), they had to think what the necessary resource for them and other teams was to use together as common properties. Moreover, this game has led them to focus on the collaboration in disaster situation.

Nevertheless, there are some limitations in this active learning tool. That is, the consistency of the knowledge conceptualization is questioned since table-top board games require skilled game masters to run them. In case the game masters have inadequate facilitation skills, players will be unlikely to show their full competence and adjust their behaviors or coordination skill. Thus, the facilitators have an important role to relate the players' reasons to their actions, thereby becoming lessons learnt leading to changes in their behavior. One example is when some teams focused on resource collection more than risk reduction. They tended not to share resources because if they allowed other SAOs to borrow the resources, their resources would be lost in this turn. The game facilitators should guide them to create trust among different teams that would lead to more resource-sharing for more flow in playing the game effectively. If the game master does not have the facilitation skill, the knowledge conceptualization would not be completed, for it is crucial that the game master helps the players to reflect their performance, feelings, and experiences from playing the game, in order to reach the conclusion of the learning goal. Thus, this game would still need further development to suit the target group.

Summary

It can be concluded that Quakequest Board Game is an effective educational tool emphasizing on the importance of collaboration when managing disaster situations. It aims to enhance the earthquake knowledge, the resource allocation skill and the collaboration attitude through gamified playing. The game is believed to be beneficial as a tool for educating Thailand's disaster knowledge as currently there has been a lack of learning tools to focus on improving soft skills. The knowledge of disaster risk assessment would be created when players consider each situation and minimize the risks, leading the increasing development of positive attitude of the collaboration as they communicate and negotiate for resources. The practice of resource allocation would adjust their mutual and sharing behavior in limited resource conditions. According to players, risk assessment knowledge was transferred, and the sharing behavior improved. In sum, it could be concluded that this game could emphasize the importance of collaboration in disaster situations as intended but further development is still suggested.

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What are the gaps in the implementation of climate change adaptation financing in Indonesia?

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Abstract

In 2012, Indonesia adopted a national action plan aimed at climate change adaptation (CCA). Since its implementation, various issues have been identified, the main one being the limited allocation of finances for this imitative. Therefore, this paper explores the financial shortcomings which are influencing the effective implementation of the CCA initiative. This study primarily explores Indonesia's national policy, in the form of institution, regulation, law and guidelines. Critical to this paper has been the discussions held with key informants of the climate change adaptation initiative and financing in Indonesia. This study found that there are a number of financial streams which contribute to CCA programs. First and foremost is the national budget, but alongside this, exist alternative financial resources such as grants from the ICCTF (Indonesia Climate Change Trust Funds). ICCTF aims to derive, manage, and mobilize investment funds for climate change mitigation and adaptation. The ICCTF is one of the main instruments utilized by the National Government to meet their mitigation and adaptation targets as outlined in the CCA National Action Plan. However, there is still limited coordination between the various financial avenues available to the CCA initiative, significantly effecting the successful implementation of their national strategies. One reason for this lack of coordination is the confusion from provincial and district/city governments on their responsibility regarding CCA programs. This is particularly felt because of the absence of guidelines to explain how to access budget for climate change adaptation programs. Therefore, one of the main recommendations is that in the planning phase, ministries/agencies should synchronize their planning and programing with the budgeting regulation enacted by the MoF. Thus, it is suggested that MoF staff are involvement at the beginning of planning. This also needs to be supported with clear and formal guidelines as to how different parties can access the necessary resources needed to finance their CCA action plans.

Keywords: financing, climate change adaptation, governance, policy

Introduction

Indonesia has long had a commitment to climate change evidenced through the existence of the Indonesia Climate Change Sectoral Roadmap (ICCSR) as well as CCA (Bappenas, 2010). Central to Indonesia's commitment is their National Action Plan of Climate Change Adaptation (NAP-CCA) or Rencana Aksi Nasional Adaptasi Perubahan Iklim (RAN-API) produced by Bappenas in 2013. Since the enforcement NAP-CCA, there has been more climate change policies issued than ever before. These include (MFE, 2018), national registry system, guideline for development of adaptation action plan, vulnerability index data and information system (SIDIK) and climate village program. At the local level, it is expected that the NAP-CCA will motivate more government participation. Despite this, the awareness of the local government to climate change adaptation is still considered low (Mongabay, 2016). As a consequence, the allocation of resources by the local government to climate change adaptation is also low.

Approximately USD 25 billion (or 7% of all climate finance) was invested into international adaptation-focused activities, these resources being drawn from the public-sector budget (Buchner et al 2014). Therefore, the source of public source budget should be highlighted in this process. The implication of this is that the national government need to seriously consider increasing the public-sector budget to accommodate such climate change impacts. In line with this, a national action plan for climate change adaptation should be followed up by allocation of budget (Tambunlertchai et al 2014; Buchner et al 2014; Ha et al 2016). Despite, the limited efforts, there has been some progresses on climate change adaptation initiatives. Some cities, particularly Jakarta and Semarang, have begun to respond to climate change impacts on flood intervention. This have been achieved through the development of physical counter-measures, such as retaining walls, flood canals (Sagala et al 2018; Gunawan et al 2015). Additionally, in Makassar, Bandar Lampung and Semarang, the same has been achieved through the preparation of documents detailing climate change adaptation & disaster risk reduction action plan (UNDP, 2015; ACCCRN, 2018).

Since 2012, Indonesia has adopted a national action plan for climate change adaptation (CCA). However, there has been a problem in the implementation of this action plan ever since it has been issued. One of the main issues is the source of finances to be used for the climate change adaptation. Therefore, this paper explores the financial shortcomings which are influencing the effective implementation of the CCA initiative. As previously mentioned, NAP-CCA, is an essential resource for national and local governments when enacting climate change initiatives NAP-CCA should be seen as an umbrella for all CCA action plans in the country.

This paper is divided into three sections, the first of which will give an overview of the background of this research topic. This section will explain the financial limitations to the effective implementation of CCA action plans in Indonesia. The second section will give an account of the methods I used to compile this paper. Finally, the third section will discuss the conclusions and recommendations for the Indonesia government (at all levels) moving forward.

Theoretical Framework of Policy Process

This research is developed from existing policy process frameworks proposed different scholars. One of them is the Advocacy Coalition Framework that can describe how policy process takes place to deal with wicked problems. The model was firstly introduced by Sabatier and Weible in 1988. It has been revised couple of times after it was tested and applied by different stakeholders in North America and Europe from the areas of energy policy, public health, education, and domestic violence (Sabatier & Weible, 2007).

Figure 1. The Diagram of the Advocacy Coalition Framework
Source: Sabatier and Weible (2007)

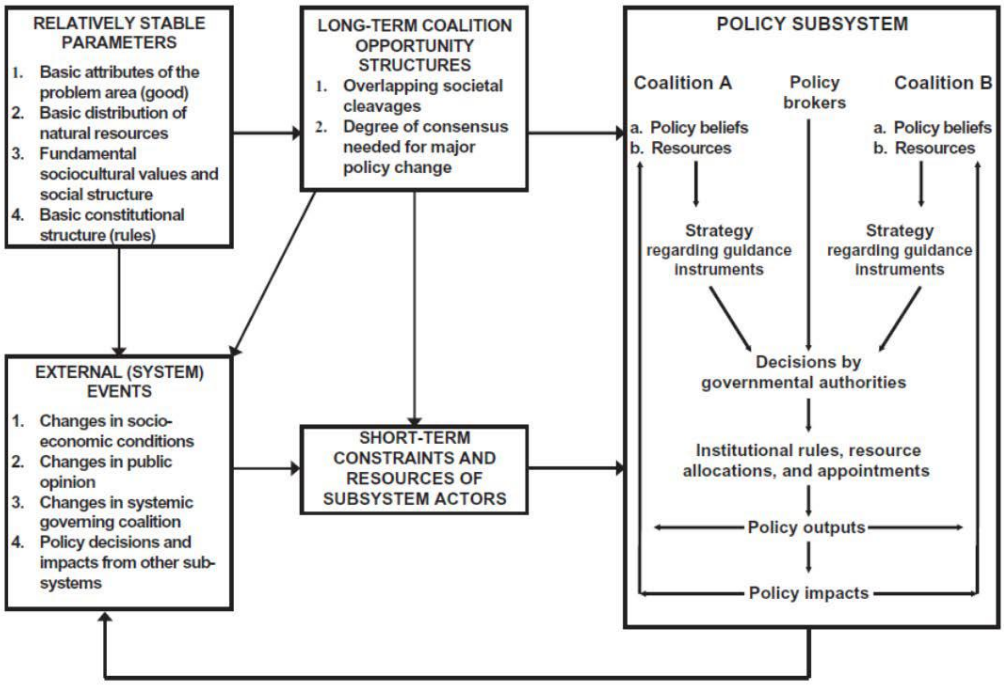


Figure 1 illustrates the Advocacy Coalition Framework. In this model, policy process comprises policy subsystem influenced by political environment. The setting creates constraints for the process, but some of opportunity exists to accelerate the performance of actors involved in the subsystem (Sabatier & Weible, 2007). The political environment is the result of interaction between relatively stable parameters, external events, long-term coalition opportunity, short-term constraints and resources of sub-subsystem actors. The sub-system is directly shaped by long-term opportunity and short constraints and resources of sub-system actors. Those actors are not only from governmental agencies, but also non-public institutions, such as universities, consultants, and non-governmental organizations. Each subsystem actor holds its own policy belief and has resources to contribute to the policy process.

A subsystem is defined by functional/substantive dimension and territorial setting. The functional/substantive dimension limits the scope of subsystem' working area with the main issue that the policy process tries to intervene (e.g. climate change adaptation policy). However, the policy-making process might be overlapping with other subsystem because it requires the role of other subsystem actors or affects their interest. Thus, the situation sometimes hampers the overall policy-making process. Territorial setting shows geographical scope where the policy takes effect (e.g. Indonesia).

Existing constraints and opportunity are driven by the political environment and both shape the policy process. There are relatively stable parameters, including basic attributes of the problem (e.g., increasing global temperature and extreme climate events), the basic distribution of natural resources, fundamental sociocultural values and structure, and basic constitutional structure. These four factors relatively remain unchanged, but these established constraints and resources for the operation of subsystem actors in the process. In addition, the political environment can be driven by external factors, including changes in socioeconomic conditions, changes in the governing coalition, and policy decisions from other subsystems (Sabatier & Weible, 2007). Subsequently, these factors form short term opportunity to change subsystem behavior and ability to overcome wicked problems in the process.

In the policy-making process, subsystem actors establish an alliance or informal network. By having this, they work together with those who share similar interest or policy belief, but also build stronger collective voices and have more shared resources. Sabatier and Weible (2007) called this as the advocacy coalitions. The network brings together and connects a wide array of parties, including public and non-public actors, from different sectors to accomplish collective goals (Van Bueren et al., 2003).

Participants in a network are connected by flows of resources, including information, financial resources, materials, and technical support (Provan & Kenis, 2008; Sabatier & Weible, 2007). Sabatier and Weible (2007) categorized different resources typically used in the coalition 1) formal legal authority to make policy decisions; 2) public opinion; 3) information; 4) mobilizable troops; and 5) financial resources. These resources are scattered across different parties from the different scale of hierarchy and authority (Comfort & Kapucu, 2006; Roberts, 2000; Van Bueren et al., 2003)

Methods

A quantitative approach was applied to understand the current situation of the integration and coordination of CCA, DRR, spatial planning and development planning. Supporting data was collected through in-depth interviews and Focus Group Discussions (FGDs) with the selected stakeholders (see the list below). The interviews were conducted between October and November 2017 in Jakarta. The selected interviewees are: The Ministry of Environment and Forestry (MoEF);

The Directorate of Climate Change Adaptation, National Agency for Disaster Management (BNPB); The Directorate of Disaster Risk Reduction; and The Directorate of Community Empowerment.

The Ministry of Land and Spatial Affairs (Kementerian Agraria and Tata Ruang – hereinafter refer to as MoLSA); The Directorate of Spatial Planning; The Directorate of Space Utilization; The Ministry of National Development Planning (Badan Perencanaan Pembangunan Nasional – hereinafter refer to as BAPPENAS); The Directorate of Environmental Affairs; The Directorate of Underdeveloped Region, Transmigration and Rural Areas; The Ministry of Finance (Kementerian Keuangan – hereinafter refer to as MoF); The Fiscal Policy Agency (Badan Kebijakan Fiskal – hereinafter refer to as BKF)); The Ministry of Home Affairs (Kementerian Dalam Negeri - hereinafter refer to as MoHA); The Directorate of Local Development Empowerment, the Sub-Directorate of Environment; The Ministry of Economic Coordinator (Kementerian Koordinator Perekonomian hereinafter refer to as MoEC); The Deputy of Coordination Infrastructure and Regional Development Acceleration; The Ministry of Public Works (Kementerian Pekerjaan Umum – hereinafter refer to as MPW); Regional Infrastructure Development Agency (Badan Pengembangan Infrastruktur Wilayah - hereinafter refer to as BPIW); The Ministry of Village, Disadvantaged Areas, and Transmigration (Kementerian Desa, Pembangunan Daerah Tertinggal, dan Transmigrasi – hereinafter refer to as MoVDAT); The Directorate of Rural Economic Development; International Federation of Red Cross and Red Crescent Societies (IFRC) dan its partner organations; Partner for Resilience (PFR); USAID – APIK Program; and UNDP.

We facilitated two FGDs to start and give input to this study on September 20, 2017, and December 7, 2017. The first FGD was attended by experts in DRR, CCA, and spatial planning. They gave some input to the scope and methodology of this study, as well as providing invaluable facts about initial integrations issues. Meanwhile, the second FGD was attended by experts in those three areas as well as Indonesian Red Cross partners. They gave much input, especially relating to the involvement of communities in the integration process at a local level.

Aside from direct interviews and meetings, this study utilized secondary data to analyze policies related to the integration of CCA, DRR, spatial planning and development planning. The secondary data consists of the regulations enacted by the Government of Indonesia, including Laws (Undang-Undang), Government Regulations (Peraturan Pemerintah), President Regulations (Peraturan Presiden), and Minister/Head of Agencies Regulations (Peraturan Menteri/Kepala). Other policies were gathered from guidelines drafts and action plans. In addition, the authors also utilized information outlined in the reports published by ministries/governmental institutions, IFRC, and other institutions. Other types of secondary data were collected from various sources, such as presentation files and mass media.

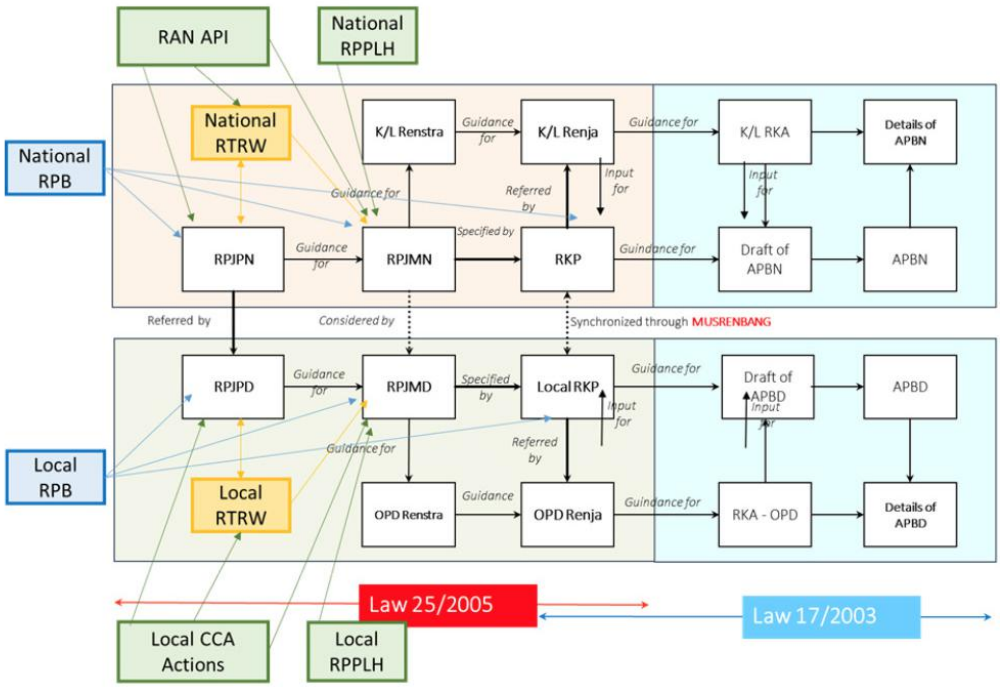
The analysis of such data was inspired from document and thematic analysis methods. Document analysis aims to review policies written on legal documents or other types of written sources. It includes skimming, reading in detail on information relevant to the topic of this study, and interpretation. The analysis also involves content analysis to organize information related to the topic of study in which the information falls into specific categories. The thematic analysis is used to identify specific patterns (themes) based on the data obtained from FGDs and interviews which the identified themes are included into specific categories. In the analysis, categorization was done to know the specific patterns related to the focus of this study.

Results

So far, there is still no coordination mechanism specifically aimed at facilitating the budgeting of CCA and DRR integration programs in spatial planning. As illustrated in Figure 1, the current budget coordination mechanism is still ensured through coordination between the development planning process and the allocation of APBN / D. In addition, there are other sources of funding that can be used not only by government institutions, but also by non-governmental institutions.

K / L and OPD submit their budget to APBN / D to finance their development programs. State / local funded development programs refer to RPJMN / D and RKP K / L or OPD RKP. To assess the local regulations on the APBD, the Minister of the Interior coordinates with the Ministry of the Interior. In addition, K / L can allocate DAKs through APBN schemes when CCA, DRR and land use programs become national priorities. DAK is allocated to specific regions to finance specific activities local businesses. The establishment of the DAK budget requires coordination between the Ministry of Home Affairs, the Ministry of Finance, BAPPENAS and K / L. According to the Ministry of Finance and interviewees, K / L should use the DAK so that CCA and DRR integration programs can be implemented at the local level.

Figure 1 Planning Coordination Mechanism of CCA and DRR into Spatial Planning and Development Planning Source: Adapted from BAPPENAS (2005)



The implementation of the programs described in the RTRW is funded by the APBD, the APBN, the private sector and / or the public sector. Therefore, the government, local governments (in agreement with their authorities), the private sector and the community, can implement the programs. To be funded by the state, RTRW programs must be integrated into the programs. RPJPN / D and RPJMN / D.

Alternative funding for the integration program may be provided by grants administered by ICCTF. It aims to obtain, manage and mobilize investment funds for climate change mitigation and adaptation. ICCTF is becoming one of the main instruments utilized by the national government to achieve their climate change mitigation and adaptation targets as described in the RAN-API. Funding comes from international funding sources such as foreign governments, development agencies and other climate change funding mechanisms. Funds are distributed to institutions that will carry out CCA activities, such as K / L, local governments, non-governmental organizations and universities.

Current planning procedures do not have instructions or guidelines explaining how the proposed programs take into account the budgeting mechanism. The guidelines for the formulation of the RPPLH, CCA actions and RPB do not indicate any budget reference issued by the Ministry of Finance, such as the budget labeling mechanism. According to the BKF interviewee, planners or policy makers often do not have a lot of information and specialties in this area. Nor do they know the arrangement of government affairs between the various levels of government. As a result, the proposed program cannot be funded and implemented.

According to the BKF interviewee, there is no standard definition for stipulating the CCA program in the current budgeting mechanism. The CCA includes multi-sectoral activities so that each K / L can create programs that really target CCA activities. There is no operational definition related to CCA, so there are differences in the designation of the CCA program between K / L. This results in inadequate budget labeling.

In addition, there are no technical guidelines for obtaining grants managed by ICCTF. These grants are accessible to K / L or local governments, but because of the absence of guidance on how to obtain such, the various levels of government are not taking advantage of this source of funding.

In addition, there is currently a village fund that can be used to finance integration programs. However, the use of this fund in the context of the integration of CCA and DRR in this spatial planning proves challenging. According to interviews with the MoVDAT representative, the use of village funds is based on the scope of the village administration, while the RTRW applies on a larger scale. Although Law 4/2014 requires the development of village areas to be necessary to refer to the RTRW of the District / City, there is a need to raise awareness of the importance of CCA and DRR so that stakeholders at the grassroots level integrate the issue into their village development planning.

CCA and DRR must be integrated with village-level development priorities. The mandate for this need was addressed by the Minister of Village 19/2017 when speaking about the financial priorities of the Village Fund in 2018. Disaster preparedness and environmental management were just some of the priorities considered. Yet this should be guaranteed during implementation.

The integration of DRR, CCA and spatial planning should be taken into account in the national budget. Today, the government faces financial challenges due to the growing gap in fiscal deficit. Tax revenues have steadily declined over the years, widening the gap between national revenues and expenditures. In addition, the growth in gross domestic product (GDP) will continue to remain slow if commodity prices fall and credit continues to tighten. This has changed the focus of the state budget to encourage productive economies, such as accelerating infrastructure development and reducing oil subsidies.

Therefore, the integration of DRR, CCA and spatial planning should be adapted to this situation. In addition, stakeholders need to recognize that integration remains a priority. As a result, programs related to DRR, CCA and land use planning need to be integrated into strategic programs that are prioritized by the government. For example, the development of the infrastructure should consider the attempt of DRR and CCA. It is very important that the threat of natural hazards as well as the funding and the implementation of integration programs are considered when proposing ways to ensure sustained development.

Table 2. **Key Findings**

Variables	Key Findings
Formal legal authority to make policy decisions	• There is no specific coordination mechanism specifically aimed at facilitating the budgeting of CCA; • There is no formal guideline in budgeting CCA actions planning; • The budgeting mechanism for CCA still follows APBN/D budgeting mechanism; and • CCA is still seen as sectoral problems.
Financial resources	• Government budgeting for CCA program is still allocated in APBN by K/L, particularly by KLHK; • DAK can be accessed by local governments to finance their CCA program; • ICCTF can be an alternative funding scheme, especially for non-governmental organizations; and • The Village Funds can finance CCA actions at village level.

Discussion

As suggested by Sabatier and Weible (2007), financial resources are one of key resources in governing wicked problem and subsystem actors are connected by regulations/mechanism to manage the resource. In our case, however, climate change adaptation is still seen as sectoral problems which only certain governmental agencies. The budgeting program of CCA still relies on K/L or OPD initiative to incorporate it in the national/local budget. It means that only certain K/L or OPD tend to stipulate it because it is their given duties to manage CCA, such as KLHK. In addition, there is still no specific guideline to strive CCA financing in each climate-related sector.

In the planning phase, K / L should refer to the budget regulation adopted by the Ministry of Finance. For example, the CCA, DRR and land-use planning could be funded from the national budget and the local budget. K / L should combine the understanding of the budgeting mechanism with the regulation of local governance. This combination will give them the means to think strategically and appropriately and thus effectively allocate the DAK. This fund is crucial to empowering the local government to implement the CCA and DRR national program and regional planning strategies.

Where neither the national budget nor the local budget can allocate the necessary sources of funding for CCA programs, other sources of funding may be used. Currently, the Government of Indonesia has established ICCTF as a trust fund for climate change. The government can also look for other sources of funding from the private sector. Today, the Ministry of Finance has issued instruments that could leverage private funds, such as the Sustainability Fund. The government must also maximize the implementation of budget labeling so that the implementation of joint programs between CCA, DRR and land use planning can be implemented with public funds.

Since stakeholders still see CCA as a sectoral problem, CCA mainstreaming to development planning process remains a priority. As a result, any programs related to DRR, CCA and land use planning must be incorporated into strategic programs in each climate-related sector that are currently prioritized by the government. For example, the development of the infrastructure should consider the attempt of DRR and CCA. This is very important to ensure that the current development has considered the threat of natural hazards and that integration programs are funded and implemented.

Conclusion

This study revealed that there are actually a number of budget sources that can be used for CCA programs, such as grants managed by ICCTF (Indonesia Climate Change Trust Funds). However, there is still limited coordination among different levels of government when it comes to the allocation of resources for CCA programs. Furthermore, regional governments are unclear as to how they can contribute to or implement CCA programs. This is particularly due to the fact that there are no guidelines for how to access the budget for climate change adaptation programs. Therefore, one of the key recommendations is that departments and agencies alike must provide a set of guidelines for how to attain resources and allocate them accordingly. Moreover, a level of synchronization is need in the planning and budgeting actions of the Ministry of Finance. This would be possible if staff from the Ministry of Finance were included in the initial stages of planning.

Acknowledgement

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Climate Information and Adaptation in Rice Farming: Observations from the Philippines

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Abstract

Between extreme events of drought and flooding, Filipino farmers have grappled with the changing rainfall patterns that lead to sub-optimal production performance. Climate change continues to threaten incomes and food security in rural communities, with small farming households as the most vulnerable victims. Using primary data from surveys in selected vulnerable villages across the country, this study examines how farmers access and utilize climate information for decision-making. Further, it investigates the adaptation behavior of rice farmers toward changes in the climate. Results show that farmers' awareness of climatic patterns is largely drawn from their own observations and experience. However, the changing climatic conditions make it more challenging for them to rely on personal historical accounts for their farm decision making. The weather forecast provided to the farmers was cited as major consideration by a small proportion of the respondents, indicating that when available, climate information is an invaluable tool in farm decision making. Local government offices were mostly the source of information on crops and varieties to plant, and in general, information about options for good farming practices. However, local climate information services still need further development and institutionalization into the extension advisories. Farmers report their autonomous adaptation strategies, which include making adjustments in the cropping calendar, replanting during early stages of the crop, and shifting to abiotic stress tolerant crops and varieties. In terms of mitigating financial impacts of adverse climatic events, farmers obtained credit from relatives. Responses showed that only 24 percent of the farmers availed of crop insurance and about 57 percent of those who did were actually able to receive pay-offs. Very few farmers have heard of the weather index-based insurance although when the concept was introduced, majority believe that the instrument will be helpful to them in mitigating against financial impacts of climate change. This paper puts forth empirically drawn insights for policy as well as for further research.

Introduction

The Philippines is one of the most vulnerable countries to climate risks because of its geographical location and level of economic development. Situated along the Pacific typhoon belt, it is ravaged every year by more than 20 typhoons and associated disasters such as torrential rains, floods, landslides and storm. It has also one of the longest coastlines in the world, which makes it highly susceptible to sea level rise. The country was identified as one of the most vulnerable to climate change in South East Asia (Yusuf and Francisco 2009)

Climate change threatens Filipino farmers' food security, livelihoods, and over-all welfare. Increasing frequency and severity of droughts and typhoons along with shifts in the rainfall pattern not only limit productivity in farming but also heighten the unpredictability of production and food supply. Mark et al. (2008) highlight some of the direct impacts of climate change on agricultural system such as seasonal changes in rainfall and temperature, which could impact agro-climatic conditions, altering growing seasons, planting and harvesting calendars, water availability, pest, weed and disease populations, alteration in evapotranspiration, photosynthesis and biomass production; and alteration in land suitability for agricultural production. Some of the induced changes are expected to be abrupt, while others involve gradual shifts in temperature, vegetation cover and species distributions. It has been stated that smallholder and subsistence farmers in developing countries are among the most vulnerable to the impacts of climate change (Easterling et al., 2007).

Adaptation to climate change in response to adverse climatic events is as much an adjustment in human systems as it is in natural systems because both moderate the harm or exploit beneficial opportunities (IPCC, 2007). Past observations note how some of the farmers employ local knowledge and skills in adapting to the impacts of climate change. On top of these 'autonomous' forms of adaptation are planned forms of adaptation which refer institutional efforts and policies that seek to enhance adaptive capacity through capacity building, introduction of new technologies, and provision of necessary infrastructure (FAO 2007, Dolan et al. 2001). Jaranilla-Sanchez et al. (2007), recommend a variety of adaptation options to the perceived impacts of climate change on Philippine agriculture such as development of stress-tolerant varieties, development of new farm management techniques, adaptive design and development of efficient farm tools and implements, improvement of post- harvest technologies, and design and installation of a management information system. Mitin (2009) documented case studies in the Philippines and found out that rice farming communities in Luzon adopted autonomous adaptation strategies such as delaying rice planting for four months and planting of alternative crops; and planned adaptation strategies with the aid of the Department of Agriculture: cloud seeding, provision of shallow tube wells, and identified alternative drought-resistant crops. A study of rice farmers in Camarines Sur also found that they have been shifting to high-yielding and/or early maturing varieties, changing planting dates, diversifying crops, and taking non-farm jobs to cope with the effects of rainfall variability and extremes (Cuesta and Rañola, 2009).

The provision of climate information to farmers through extension advisories is one of more recent forms of planned adaptation efforts from the public and non-profit sectors. Piloting efforts such as the USAID-funded Bicol Agri-Water Project (BAWP) have demonstrated how climate forecast information, when incorporated into an extension advisory bulletin for farmers, can enable them to make informed coping and adaption decisions in farming (Rola et al 2017). However, IPCC (2007) observes that while there have mean many interventions developed to aid adaptation, the extent of use of such interventions (as the CIS in the Philippines) is still found lacking.

This paper examines how farmers access and utilize climate information for decision-making. Further, it investigates the adaptation behavior of rice farmers toward changes in the climate. In so doing, our study stands to inform ways that planned interventions like provisioning of climate information services may best reach target stakeholders.

Methodology

The study was conducted under the Climate Information Services (CIS) Project of the second phase of the Adaptation and Mitigation (AMIA2) in Agriculture Program of the Philippines' Department of Agriculture (DA). It covered ten provinces across the country: Ilocos Sur, Isabela, Tarlac, Quezon, Camarines Sur, Iloilo, Negros Occidental, Bukidnon, Davao del Norte, and North Cotabato (Figure 1). Selection of the study sites was based on the AMIA2 program-level goal of targeting potential areas for coordinated adaptation and mitigation interventions by various national agencies. Three municipalities each from the ten provinces were selected based on the presence of the weather data collection instruments such as Automatic Weather Station (AWS) and agrometeorological stations. A total of 405 respondents were randomly drawn from farmer lists in the most vulnerable barangay (village) as reported by the Municipal Agriculture Office (MAO). In each of the 27 barangays covered, 15 respondents participated in structured interviews (Table 1). Descriptive analysis was applied to the collected data.

Figure 1. Provinces covered by CIS project

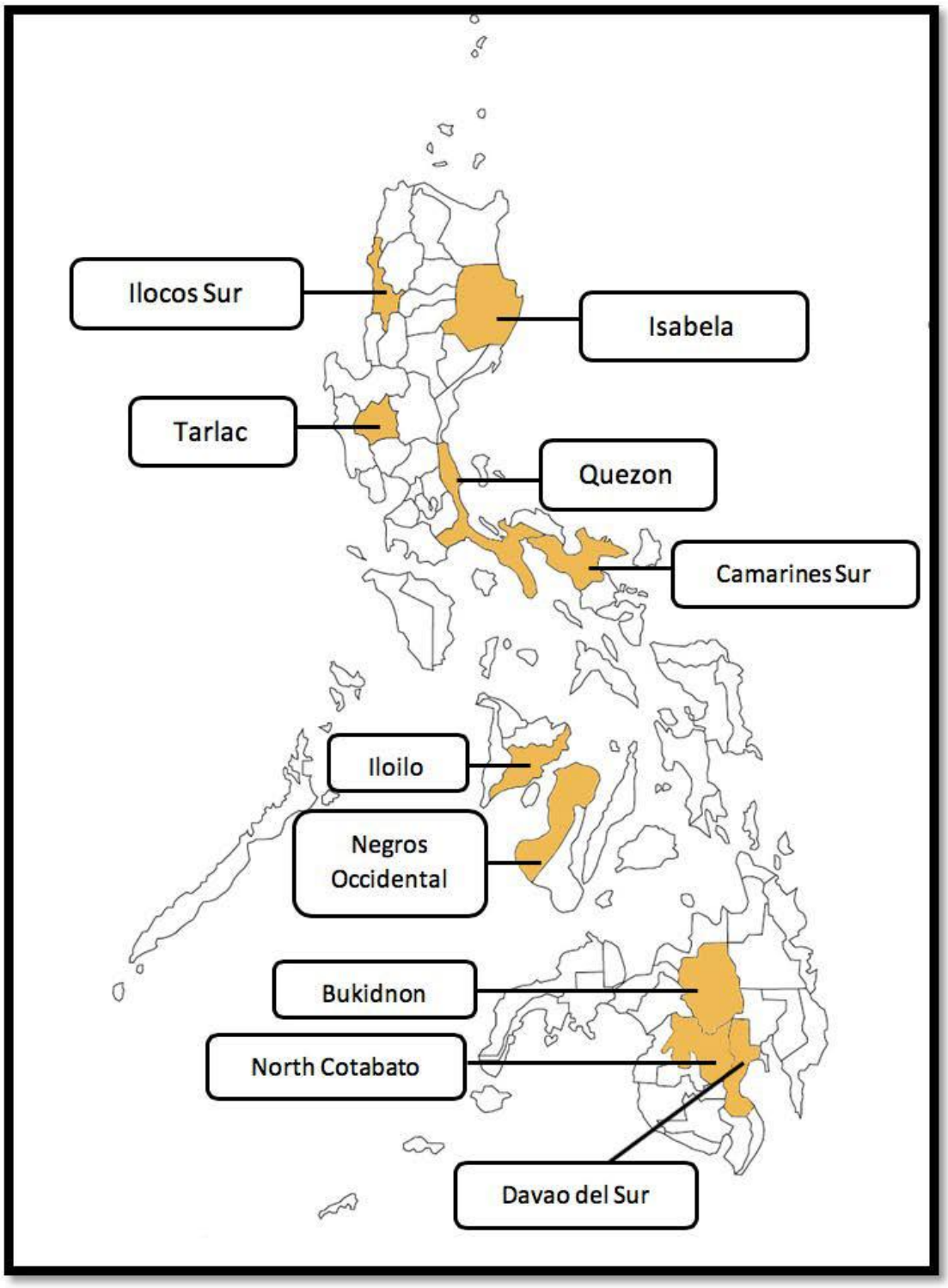

Table 2. Study areas for the farmers survey

Region	Province	Municipality	Barangay
Region I	Ilocos Sur	Sinait	Paratong
		Lidlidda	Bequi-walin
		Sta. Maria	Lingsat
Region 2	Isabela	Ilagan City	Bangag
		Tumauini	Fugu abajo
		Roxas	San Placido
Region 3	Tarlac	Paniqui	Sta. Ines
		Camiling	Pindangan 2
		Gerona	Sembrano
Region 4A	Quezon	San Antonio	Del Valle
		Lucban	Ayuti
		Lopez	Lalaguna
Region 5	Camarines Sur	Pamplona	Poblacion
		Pili	San Agustin
		San Jose	Pugay
Region 6	Iloilo	Calinog	Banban Pequeño
		Sta. Barbara	Ban-Ag
		Miagao	Bagumbayan
Region 18 (NIR)	Negros Occidental	Toboso	Bug-ang
		Bago	Pacol
		Sipalay	Nauhang
Region 10	Bukidnon	Malaybalay	San Jose
		Dangcagan	Bugwak
		Kalilangan	Ninoy Aquino
Region 11	Davao	Davao City	Callawa
Region 12	Cotabato	Arakan	Badiangon
		Kidapawan City	Macebolig

Results and Discussion

Farmer and farm characteristics

As with many agrarian societies, the population of farmers in the study were largely classified as aging. About 60 percent of farmers were aged older than 50 years (Table 2). Farming is still very much a male occupation as majority of the respondents (68%) were male. For majority of the households represented, both farmer and spouse have completed basic education, i.e., elementary and high school. About 11 percent of them were college graduates (Table 3).

Table 3. Frequency of Ages and Sex of farmer respondents

Particulars	n	%
Age Range		
21-30	12	3.0
31-40	52	12.8
41-50	97	24.0
51-60	122	30.1
61-70	82	20.2
71-80	37	9.1
81-90	3	0.7
Total	405	100.0
Mean Age	54	
Sex		
Male	277	68.4
Female	128	31.6
Total	405	100.0

Table 4. Highest educational attainment of the farmer respondents and their spouse.

Particulars	Highest Educational attainment			
	Farmer Respondent		Spouse	
	n	%	n	%
Elementary Undergraduate	50	12.3	45	13.5
Elementary Graduate	118	29.1	93	27.9
High School Undergraduate	46	11.4	40	12.0
High School Graduate	111	27.4	100	30.0
College Undergraduate	25	6.2	21	6.3
College Graduate	45	11.1	28	8.4
Vocational	9	2.2	4	1.2
Post Graduate	1	0.2	1	0.3
Don't Know			1	0.3
Total	405	100.0	333	100.0

Half of the respondents owned the land they were cultivating. Thirty-one percent reported being under a tenancy arrangement, 18 percent were renting or leasing the land and 3 percent were mortgage owners (Table 4). Farming is largely done at small-scale in the study areas. On average, a farmer cultivates a land area of 1.49 hectares. Of these farms, the area dedicated to rice production is on average, 0.94 hectares. These distinct characteristics of tenure and farm sizes are deemed to affect farm decision-making, which further analysis could shed light into the drivers and challenges of climate change adaptation at the farm level. Such inquiry is beyond the scope of this paper but will be addressed in future work.

Table 5. Farm characteristics of farmer respondents

Particulars	n	%
Tenurial Status*		
Owner	206	50.9
Tenant/ Shareholder	126	31.1
Renter/Lessee	72	17.8
Mortgage Owner	11	2.7
Mean Total land area	1.4947	
Mean Total rice land	.9400	
Mean Total other land use	.3965	
Source of Water*		
None/Rainfed	184	45.4
Pump irrigation from open source, e.g., river (PISO)	110	27.2
Communal Irrigation system	65	16.0
Shallow tube well	56	13.8
National Irrigation System	45	11.1
Small water impounding project (SWIP)	3	0.7
Small farm reservoir (SFR)	3	0.7
Number of cropping		
1	46	11.4
2	317	78.3
3	42	10.4
Total	405	100.0

**Multiple response*

Almost half of the respondents don't have access to irrigation. These farmers rely on the rain for their production, making them highly vulnerable to changing rainfall patterns. Twenty-seven percent of respondents use pump irrigation from an open source like river while some (16%) access water for irrigation through a Communal Irrigation System (CIS). Other irrigation sources included shallow tube wells (14%), the national irrigation system (11%), the Small Water Impounding Project (SWIP), and small farm reservoir. Despite challenges in irrigation source among many of the farmers, majority (78%) of respondents practice two cropping per year.

Farmers and climate information

Farmers' awareness of climatic patterns is largely drawn from their own observations and experience. However, the changing climatic conditions make it more challenging for them to rely on personal historical accounts for their farm decision making. In the interviews, farmers recalled the extreme events that affected them in the past five years. Among those events, heavy rains were the most frequently reported (Table 5). As the ability to predict the occurrence of extreme events is deemed a great help to individual adaption decisions to climate change, farmers were asked about they have tried to ascertain the occurrence of extreme events from 2012 to 2016 (Table 6). Majority of the respondents admitted that they were not able to tell in advance the occurrence of drought and flood or typhoon. For farmers who indicated that they can somehow predict the occurrence of the extreme events, a follow-up question was asked about how many times they have seen their 'prediction' was actually realized. About 40 percent of the respondents said they were able to correctly anticipate the occurrence of a drought only once while about 29 percent were twice correct. When it comes to flood and typhoon events, 28 percent of the responding farmers indicated getting it right twice while 27 percent got it right once. What these indicate is that for farmers with some level of confidence to predict climate-related events, a greater proportion found success in being able to anticipate drought than floods or typhoons.

Table 6. Mean Frequency of Extreme Events Experienced by respondents during the last five years

Extreme Events	Mean Frequency of Extreme Events since 2012 (per year)
Heavy rains	4.60
Typhoon	3.61
Flood	3.59
Drought	2.61

Table 7. Farmers predictions of occurrence of extreme events from 2012-2016

	Drought		Flood/Typhoon	
Particulars	n	%	n	%
Can you predict the occurrence of Extreme events				
Yes	146	36.0	146	36.0
No	259	64.0	257	63.5
No Response	0	0	2	.5
Total	405	100.0	405	100.0
If yes how many times were you correct				
1	58	39.7	39	26.7
2	42	28.8	41	28.1
3	13	8.9	27	18.5
4	16	11.0	14	9.6
5	14	9.6	21	14.4
Others	3	2.1	4	2.7
Total	146	100.0	146	100.0

Particulars	Drought		Flood/Typhoon	
	n	%	n	%
Basis of prediction*				
Based on prevalent/observed weather in the locality	49	33.6	56	38.4
Months of the year	15	10.3	9	6.2
Information from TV/Radio	11	7.5	10	6.8
Weather forecast	12	8.2	14	9.6
Population and behaviour of birds	8	5.5	0	0
Observation of the environment	13	8.9	20	13.7
Climate pattern	5	3.4	4	2.7
Based on frequency of heavy rains	0	0	10	6.8
No response	0	0	1	0.7
Others	12	8.2	14	9.6
Do you decide on farming practices based on your prediction				
Yes	118	80.8	120	82.2
No	25	17.1	26	17.8
No response	3	2.1	0	0
Total	146	100.0	146	100.0
If no, why not?				
Crop Suitability	6	24.0	10	38.5
They rely on their usual practice	7	28.0	9	34.6
To avoid production losses	6	24.0	2	7.7
No response	2	8.0	0	0
Others	4	16.0	5	19.2
Total	25	100.0	26	100.0

**Multiple response*

Reliance on past experiences, as discussed above, was practiced by only about 21 percent of the farmers. Other bases for expectations of droughts, floods or typhoons include generally observed prevalent climate in their locality, weather conditions associated with months of the year, information from TV/radio, weather forecasts, as well as the population and behavior of birds. Farmers also reported that they rely on their usual practice (28%) during drought-prone seasons and choose to cultivate crops generally considered as suitable for planting (38%) during flood and typhoons prone seasons.

In a study about the climate change adaptation for smallholder farmers, Lasco, et al. (2011) show that farmers associate resurgence of pests and diseases in rice, corn and fruit trees with climate change. Results of our survey affirm such report as farmers reported perceived changes in the occurrence of pest and disease incidence during seasons affected by drought and floods/typhoons (Table 7). Majority of the farmers said that insect population increased during drought and decreased during floods. For the diseases, most of the farmers noted that disease incidence on plants increased during drought and floods/typhoons. Similarly, most of the farmers reported that weeds incidence increased during drought and flood/ typhoon events. The number of rodent population was not observed to change.

Table 8. Perceived changes in the occurrence of pest incidence during 2012-2016

Particulars	Drought		Flood/Typhoon	
	n	%	n	%
Insects				
Decrease	72	21.3	56	16.6
Same	100	29.6	73	21.6
Increase	122	36.1	186	55.0
Others	44	13.0	23	6.8
Total	338	100.0	338	100.0
Diseases				
Decrease	54	16.0	29	8.6
Same	113	33.4	124	36.7
Increase	135	39.9	167	49.4
Others	36	10.7	18	5.4
Total	338	100.0	338	100.0
Rodents				
Decrease	33	9.8	41	12.1
Same	162	47.9	169	50.0
Increase	66	19.5	69	20.4
Others	77	22.7	59	17.5
Total	338	100.0	338	100.0
Weeds				
Decrease	52	15.4	37	10.9
Same	101	29.9	115	34.0
Increase	136	40.2	166	49.1
Others	49	14.5	20	5.9
Total	338	100.0	338	100.0

Farmers' decision-making considerations

In this descriptive analysis of farmer adaptation decisions, we focus on two vital decisions farmers make every cropping season: what to plant and when to plant. These concerns are closely linked to perceptions and knowledge about the climatic conditions. Table 8 shows the major considerations of farmers on what crops to plant in ordinary times. The top five responses include availability and quality of seedlings, availability of water, capital, price, and weather forecast provided to them. The weather forecast provided to the farmers was cited as major consideration by 28 percent of respondents, indicating that when available, climate information is an invaluable tool in farm decision making. Other considerations include indigenous knowledge and traditional practices, market, technical/financial assistance, cost of production, for food consumption, ease of planting and maintenance, and crop suitability to their land.

Table 9. Major consideration on what crops to plant

Considerations*	n	%
Availability and quality of Seedlings	178	43.95
Availability of water	164	40.49
Capital	128	31.60
Price	127	31.36
Weather forecast provided to them	113	27.91
Market	107	26.42
Cost of production	91	22.47
Technical/Financial Assistance	81	20.00
Indigenous knowledge	45	11.11
For food consumption	33	8.15
Crop suitability to their land	28	6.91
Traditional	26	6.42
Easy to plant and maintain	14	3.46
Others	15	3.70

**Multiple response*

Table 9 shows the small extent to which indigenous knowledge has been used as basis for the decision about when planting should be done in a season. Some of the popular indigenous knowledge reported by the farmers include planting during full moon or planting based on the size of the moon (or during high tide), use of an old calendar known as Almanac, and according to birds' behavior. According to some respondents, the presence of "tulabong" bird in the field signifies the coming of rain. There is also belief that one should sow if there are clouds during daytime in the mountains. Some of the beliefs like planting with full stomach for a good harvest is however more superstitious than reflective of indigenous knowledge known to be passed down form ancestors.

Table 10. Indigenous knowledge used as decision tool for planting date.

Particulars*	When to plant	
	n	%
Indigenous Knowledge*		
Plant during full moon	15	3.70
Based on the size of the Moon	5	1.20
Calendar dates with number 0, 8 and 6	5	1.20
Don't plant during Thursdays	2	0.50
Based on old calendar also known as Almanac	1	0.20
Birds' behavior	1	0.20
Plant during high tide	1	0.20
Presence of «tulabong» bird in field signifies rain	1	0.20
Plant with full stomach	1	0.20
Presence of clouds during daytime in Mt. Isarog	1	0.20
None	373	92.10
Source		
Parents	14	3.50
Ancestors	11	2.70
Elders	4	1.00
Grand parents	2	0.50
Neighbor	1	0.20
Not Applicable	373	92.10

**Multiple response*

Access to information through extension is seen to increase the probability of farmers taking up adaptation strategies (Nhemachena and Hassan, 2007). It is also argued that government extension, farmer-to-farmer extension and climate information increase the probability of adaptation to climate change (Di Falco et al., 2011). Results of the survey reflect these views as evident in current extension efforts. Aside from farmers' own experiences, the local government offices (municipal and barangay) were mostly the sources of information on crops and varieties to plant, and in general, information of options for good farming practices (Table 10). However, many farmers reported that they obtained information about the climate and climate forecasts from the mass media, i.e., newspaper, radio or the TV. Considering that all study sites were confirmed to have local climate information collection equipment and piloted mechanisms (through local extension advisories) to process raw date into extension advisories, such behavior of respondents indicates that the publicly installed local climate information services will still need further development and institutionalization in order for farmers to make use of not only of locally specific climate information for their farming decisions but of climate-informed extension advisories from their local extensionists.

Table 11. Technical support provided to farmers and corresponding source of information (Top answers are highlighted)

Particulars*	n	%
When to plant		
Respondent's own experience	209	51.6
MAO/AT/Barangay officials	79	19.5
Other farmers	69	17
Others	91	22.5
What crop to plant		
Respondent's own experience	205	50.6
MAO/AT/Barangay officials	102	25.2
Other farmers	45	11.1
Others	87	21.5
Variety to plant		
MAO/AT/Barangay officials	152	37.5
Respondent's own experience	151	37.3
Other farmers	72	17.8
Others	81	20
Fertilizer to use		
Respondent's own experience	164	40.5
MAO/AT/Barangay officials	126	31.1
Other farmers	59	14.6
Others	107	26.4
Pesticide to use		
Respondent's own experience	148	36.5
MAO/AT/Barangay officials	129	31.9
Other farmers	57	14.1
Agricultural Supplies Store	55	13.6
Neighbor / friends	52	12.8
Others	24	5.9

Particulars*	n	%
Climate information		
Radio/TV/Newspaper	334	82.5
PAGASA	50	12.3
Others	68	16.8
Climate forecast		
Radio/TV/Newspaper	331	81.7
PAGASA	77	19
Others	47	11.6
Credit		
Neighbor / friends	91	22.5
Other farmers	86	21.2
Respondent's own experience	69	17
MAO/AT/Barangay officials	47	11.6
Crop insurance		
MAO/AT/Barangay officials	163	40.2
None	81	20
No response	49	12.1
Others	120	29.6
Good Practice Options (GPOs)		
MAO/AT/Barangay officials	236	58.3
Respondent's own experience	64	15.8
Others	128	31.6

**Multiple response*

With regard to relevant support, credit information was most of the time provided by co-farmers while crop insurance information was also sourced through the local government offices. Local government agencies are seen here as fully engaged as sources of technical information of farmers. On the other hand, we note from key informant interviews we have done for the state-of-the-art study on CIS in the Philippines (Lapitan, et al., 2018) that most of local extension usually source their climate information from the national weather bureau through the mass media. Even with presence of local climate information gathering facilities, localized climate information has yet influence content of most extension advisories.

Climate change impacts and farmers' adaptation strategies

One of the impacts of climate change is decreased yield. As seen in Table 11, on average, the highest mean yield is attained during the normal year and yield declines were observed during an extreme event such as drought and flood/ typhoon. For the first cropping season for rice, corn and high value crops, yield have significantly declined for either drought or flood year. For the 2nd cropping season, the trend is generally the same.

Table 12. Mean yield (in kg/hectare) during normal year, drought and flood/typhoon.

Particulars	Normal Year	Drought	% Damages	Flood/ Typhoon	% Damages
1st Cropping					
Rice	3484	1742	-50	1890	-46
Corn	3702	1360	-63	998	-73
High value crops	2037	1451	-29	686	-66
Fruit trees	1600	2000	25	400	-75
2nd Cropping					
Rice	2957	1665	-44	1793	-39
Corn	3667	2130	-42	1361	-63
Root crops	3400	800	-76		
Vegetables	5850	10000	71	425	-93
High value crops	5062	2990	-41	1649	-67
3rd Cropping					
Rice	3430	1951	-43	2033	-41
Corn	1887	1917	2	917	-51

Table 12 summarizes the mean area planted and mean yield per hectare for normal year, drought and flood/typhoon per cropping. To cope with extreme weather events, farmers report that they reallocate the area planted to certain crops. They also reduce area planted for the crops not suitable for the forecasted weather and allot more to the suitable crops. Others chose to not plant during times of drought or flood. In the case of rice farms during drought, farmers slightly reduce area planted. But, during flood/ typhoon, farmers use same area as in normal year.

Table 13. Mean land area (in hectares) during normal year, drought and flood/typhoon.

Particulars	Normal Year	Drought	% increase/ decrease	Flood/ Typhoon	% increase/ decrease
1st Cropping					
Rice	1.11	1.07	-3.60	1.11	0.00
Corn	1.49	1.44	-3.36	1.45	-2.68
High value crops	1.31	1.44	9.92	1.31	0.00
Fruit trees	3	3	0.00	3	0.00
2nd Cropping					
Rice	1.16	1.14	-1.72	1.15	-0.86
Corn	1.2	1.19	-0.83	1.18	-1.67
Root crops	0.33	0.15	-54.55		
Vegetables	0.38	0.5	31.58	0.38	0.00
High value crops	0.69	0.68	-1.45	0.83	20.29
3rd Cropping					
Rice	0.97	0.94	-3.09	0.96	-1.03
Corn	2.15	2.25	4.65	2.25	4.65

Extreme events may lead to production losses as seen in Table 13, where about 33 percent of the farmers had losses of 41-60 percent of their total production. Unfortunately, farmer respondents did not find crop insurance an appealing adaptation option as responses showed that only 24 percent of them availed of this facility. Majority of the farmers (57%) received pay-offs; of these 54 percent received pay-off of PhP1,000-PhP5,000 only.

According to Deressa et al. (2011), access to credit can influence adaptation to climate change. However, majority of farmers (55%) did not consider getting loan as a way to cope with their losses. Twenty one percent opted to get loans from their family or relatives.

Table 14. Crop insurance

Particulars	n	%
Do you have crop insurance		
Yes	97	24.0
No	308	76.0
Total	405	100.0
How much loss did you incur during the recent extreme event		
0-20%	41	10.1
21-40%	59	14.6
41-60%	135	33.3
51-80%	84	20.7
81-100%	84	20.7
Don't know	2	.5
Total	405	100.0
Did you receive pay-off?		
Yes	55	56.7
No	42	43.3
Total	97	100.0
How much pay-off were you paid		
1000-5000	30	54.5
5001-10000	12	21.8
10001-15000	7	12.7
15001-20000	1	1.8
20001-25000	1	1.8
25001-30000	4	7.3
Total	55	100.0
Mean Pay-off received	7573	
Was this enough to cover your losses		
Yes	8	14.5
No	47	85.5
Total	55	100.0

Particulars	n	%
Did you consider getting loan as coping mechanism		
Yes	181	44.7
No	223	55.1
No losses	1	.2
Total	405	100.0
If yes, Source of credit/loan*		
Family/relatives	38	21.0
Miller	28	15.5
Buying Station	20	11.0
Cooperative/association	20	11.0
Neighbor/friend	18	9.9
Private lender/individual	18	9.9
Bank	17	9.4
Agricultural supply store	11	6.1
Other farmers	7	3.9
Others	10	5.5

**Multiple response*

Weather index-based crop insurance (WIBI) is an instrument that places a guarantee on weather risks such as drought and flood, which are typically correlated with agricultural production losses. Only six percent of farmer respondents have heard about WIBI (Table 14). Majority of them (54%) have heard it from the MAO. A quarter of the farmers heard it from the agricultural technicians. Other sources of information about WIBI included barangay officials, friends, neighbors, and the PCIC. Most of the farmers (42%) know WIBI as payment for extreme events like excess/ lack of water. Some farmers (25%) knew it as insurance during drought, flooding and typhoon situation. Others knew it as farm insurance (12.5%) and assistance for farmers (12.5%). Only one farmer knew WIBI as the insurance that uses climate information to determine the pay-out. Majority (92%) believe that WIBI will be helpful to them.

Table 15. Knowledge on Weather Index Based Insurance Scheme.

Particulars	n	%
Have you heard of WIBI		
Yes	24	5.9
No	381	94.1
Total	405	100.0
If yes, where did you get information*		
MAO/CAO	13	54.2
Agricultural Technician	6	25.0
Friend	3	12.5
Neighbors	3	12.5
PCIC	3	12.5
DA-RFU	2	8.3
Barangay Officials	1	4.2
What do you know about WIBI		
Payment for extreme events like excess/lack of water	10	41.7
Insurance during drought, flooding, and typhoon situation	6	25.0
Assistance for the farmers	3	12.5
Farm Insurance	3	12.5
Insurance that uses weather/climate to determine the pay-out	1	4.2
No response	1	4.2
Total	24	100.0
Do you think WIBI will be helpful to you		
Yes	22	91.7
No	0	0
No response	2	8.3
Total	24	100.0
If yes how can it be helpful		
Financial support during extreme events	18	81.8
Security for farmers	2	9.1
They conduct seminars on proper farming	1	4.5
No response	1	4.5
Total	22	100.0

**Multiple response*

During normal year, farmers plant during the months of March to July and harvest from the months of June to November for the 1st cropping season. For the 2nd cropping season, farmers plant during the months of September to January and harvest from November to April. In Table 15 it can gleaned that most of the farmers (45%) have no source of water and rely on the occurrence of rain. Some (23%) get water from pump irrigation, from open source and communal irrigation (19%). Other farmers get water from shallow tube wells (13%). Other sources of water include National Irrigation System, Small Water Impounding Project (SWIP) and small farm reservoir.

Table 16. Farmers production practices during normal times, Philippines, 2012-2016

Particulars	n	%
Source of water*		
None/Rainfed	149	44.88
Pump irrigation from open source, e.g., river (PISO)	77	23.19
Communal Irrigation system	62	18.67
Shallow tube well	44	13.25
National Irrigation System	37	11.14
Small water impounding project (SWIP)	3	0.90
Small farm reservoir (SFR)	2	0.60
Varieties used*		
Inbred	269	79.59
Hybrid	73	21.60
Traditional	6	1.78
Can't Remember	3	0.89

**Multiple response*

Adjustments in the cropping schedule is a climate change adaptation measure practiced by majority of the interviewed farmers (Table 16). Farmers usually delay sowing or transplanting until signs of the rainy season onset are observed; in many villages. Such strategy is adopted in consideration of the high water needs of the crop at its early growth stage. Majority of the respondents also report adjusting harvest dates to cut down on possible losses from oncoming typhoons. In some cases, harvesting is done before the forecasted landfall of a typhoon to minimize losses from plant either due to lodging caused by strong winds or extended submergence in floods. In cases when the typhoon is not expected to be devastating, farmers wait for the typhoon to pass in order to give the grains time to mature further. Majority of the farmers use inbred varieties during a normal year but during an extreme event, as an adaptation practice they replant using either the same inbred varieties or in most cases, other resistant varieties.

Table 17. Coping mechanisms for the effects of extreme events, Philippines, 2012-2016

Particulars*	n	%
Time of Planting		
Adjust planting date consider weather and water	220	80.88
Others	74	26.91
Harvesting dates		
Adjust harvesting dates consider having good weather	188	64.16
Advance harvesting	55	18.77
None	36	12.29
Others	18	6.14
Varieties used		
Replant using other resistant varieties	104	55.61
Replanting with the same variety	29	15.51
Drain excess water	9	4.81
None	30	16.04
Others	30	16.04

**multiple response*

Summary and Conclusion

Filipino farmers' awareness of climatic patterns is largely drawn from their own observations and experience. However, the changing climatic conditions make it more challenging for them to rely on past experiences and knowledge for their farm decision making. Climate information is one of the major considerations of farmers in deciding what crops to plant. Other top considerations include, availability and quality of seedlings, availability of water, capital and price. Of these, availability of water is entwined with climate information. Ultimately, climate information services can be deemed as the most appropriate support that can aid farm-level decision making in the face of the changing climatic conditions.

Local climate information is hence yet to be integrated in the extension advisory at this time in these study sites. While the source of climate information of farmers is the mass media; while the source of extension information and good practice options are the MAO/CAO and the barangay officials. Local government offices have been mostly the farmers' source of information on crops and varieties to plant, and in general, information about options for good farming practices. There exists the benefit of earlier pilot projects serving as model for incorporating local climate information services into extension advisories.

Adaptation strategies used by farmers includes changes in planting decision such as change in planting calendar, delaying harvesting and use of resistant varieties. For their source of water, most of them wait for the water caused by heavy rains/typhoon to subside or drain or look for other sources of water. Yields were also shown to be negatively affected by the extreme events. Meanwhile, formal credit and crop insurance were not popular options in coping with the losses due to weather events. Farmers who needed to borrow to invest once more due to damages from floods or drought usually borrow from relatives and friends. While WIBI has also yet to be introduced as a mitigating mechanism, farmers who were introduced to the concept showed high reception to the possibility of its implementation.

These findings underscore the key role of local governments in providing enabling mechanisms for farmers to make autonomous adaptation decisions to ensure sustenance and resilience of their livelihoods. Much progress is evident with the installation of local climate information gathering facilities in critical areas around the country. Next on the plate is continued strengthening of local capacities to utilize local climate information for improved extension advisories. The challenge is in institutionalizing piloted efforts such as those of the BAWP in Bicol, and more recently the CIS Project in the study sites.

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SUB-THEME 2

Gender and Diversity in Psychosocial Support Programme - A Content analysis of Indonesian Red Cross Psychosocial Debriefing Programme Manual

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Abstract

The research presents the content analysis of the Indonesian Red Cross (locally known as Palang Merah Indonesia or PMI) Psychosocial Support Group manual using the indicator of the Minimum standard commitments to gender and diversity in emergency programming. This manual is the guidance that used by the Indonesian Red Cross PSP (psychosocial support program) facilitator to manage the support groups session for the survivor that experienced critical incident.

This paper highlights the gender and diversity issue on the manual. Specifically, this paper discusses the potential adaptation of DAPS (Dignity, Access, Participatory and Access) commitment. The research question is which section are forms and examples of minimum standard commitment of gender and diversity into PMI Psychosocial support group manual. As for the approach used is a grounded theory approach to content analysis or content analysis.

The research findings are that DAPS (Dignity, Access, Participatory and access) as the indicator of minimum standard commitment to the gender and diversity in emergency programme (published by IFRC publication in 2015: "Minimum standard commitments to gender and diversity in emergency programming: Pilot Version") are already adapted into the manual of Indonesian Red Cross Psychosocial support group session. Based on the report, the support group is one of the PSP given by Indonesian Red Cross to the survivors of sexual violence. The aspect which has not been included yet in the manual is related to the safety. It's found that data of the survivors (especially whom have been exposed by sexual violence) who joined the programme are still with name instead only by the number of incident, sex and age disaggregated.

This research may provide the first step to give the idea of survivor center approach into the PSP (Psychosocial Support Program) of Indonesian Red Cross, especially for the survivor of sexual and gender-based violence.

Keywords: Gender and Diversity, Psychosocial Support Programme, Psychosocial Support Group Session, Volunteer, Indonesian Red Cross Society

Introduction

Gender and Diversity in Disaster

The Indonesian archipelago is constantly at risk of earthquakes, volcanic eruptions, floods and tsunamis. Located in the Pacific Ring of Fire, there is at least one significant volcanic eruption and one major earthquake in the country every year. A large tsunami can occur once in every five years. Hence, disaster management has become a special concern in Indonesia, especially by the government and humanitarian organizations.

Women are especially hard-hit by the social impacts of environmental disasters. Existing inequalities are the root cause of women's disaster vulnerability. Global forces and social changes placing more people at greater risk of disaster also disproportionately impact women. Women are particularly vulnerable because they have fewer resources in their own right and under their own control (Gokhale, 2008). The increasing prevalence of gender-based sexual violence (SGBV) and the imposition of marriage are two of the various problems of gender inequality that also threaten women in post-disaster situations (UNIFEM, 2005a; Pittaway, Bartolomei dan Rees, 2007).

Gender mainstreaming in disaster management refers to the balance of roles, responsibilities, needs, interests and capacities of men and women. Gender Mainstreaming is needed to ensure that special needs, levels of vulnerability, and capacity of men and women (which are set in the context of a broader class, ethnicity, race, culture and religion) are applied in disaster management services and in program development - community based program. Natural disasters, conflicts, social and political instability can have different impacts on men and women. Likewise, emergency response activities and humanitarian assistance carried out can also have different effects on men and women. The full involvement of men and women in all PMI activities not only ensures gender sensitivity, but also increases the efficiency and effectiveness of disaster management services. In this connection, PMI places gender sensitivity into an integrated part of all disaster management activities, both in disaster risk reduction activities, emergency response activities and initial rehabilitation in the aftermath of a disaster.

Indonesian Red Cross Society

Indonesian red cross society known as Palang Merah Indonesia (PMI) is a neutral and independent organization. PMI established with so much influenced by the principles of Universal Red Cross movement. It formed based on the encouragement of humanitarian spirit and national consciousness. Meanwhile, the main function of PMI is to assist the government in the field of social humanity. On the other hand, PMI does not do distinction among others. Their priority is help those who need of urgent assistance. Therefore, Indonesian red cross society basically not in favor of any aspects which not considered as social humanity.

PMI implement the Individual Code of Conduct, and the Framework for Strengthening Characters and Values in the PMI Services where Gender and Diversity are at the core. In particular, PMI has a Gender and Diversity Focal Point which is a member of the South East Asia Gender and Diversity Network and has received training and assistance from IFRC. The development so far shows that the existing PMI capacity still needs to be improved to be more effective in carrying out humanitarian services and increasingly able to reach the populations that need it most. As a follow-up, PMI has formulated PMI's strategies and approaches related to Gender Sensitivity in Disaster Management. PMI puts gender sensitivity into an integrated part of all disaster management activities, both in disaster risk reduction activities, emergency response activities and initial rehabilitation in post-disaster. Specifically, in Emergency health programming, there is an attention to psychosocial health services for women and men.

PMI Psychosocial Support Program

The Psychosocial Support Program (PMI) is a form of PMI Services aimed at disaster-affected people. Psychosocial support is given to people whose source of problems is the result of the interaction of the environment with oneself. In Disaster situations, PSP can be given at any phase (emergency phase until the reconstruction phase) but the shape will vary. One of the PSP programs in the disaster is the effort to provide psychosocial support for humanitarian workers (PMI staff and volunteers). This is because working in the humanitarian field is not easy. Many challenges must be faced when carrying out their work. One or more experienced a critical incident. Critical incidents are experiences or situations that involve negative emotions that are strong enough to require unusual coping skills.

Although in the end they can recover on their own, but it is better if those who experience critical incidents are assisted in the recovery process. One of PMI's efforts is to conduct debriefing activities. PMI uses the term " support group session" rather than a debriefing because this session is conducted by trained volunteers and not mental health professionals.

To conduct a support group session with the standard process and procedure, in 2011 PMI issued a support group session guideline. In fact, support group session was not only given to PMI staff and volunteers. In 2014, PMI collaborated with BNP2TKI to provide support group for women migrant workers with a problem. Their returning is because of facing problem, such as: legal problem, financial problems, physical and sexual violence. This program runs until 2017.

As a part of humanitarian assistance efforts, PSP PMI specifically the support group session must adapt challenges related to gender and diversity. This is because the PSP program is closely related to the beneficiaries that have different needs, vulnerabilities and capacities.

Minimum Standard Commitment to Gender and Diversity in Emergency Programming

Females and males of all ages and backgrounds have very different needs and concerns and have different coping strategies on which to draw. These differences must be recognized and incorporated into all emergency responses (IFRC, 2018). This guidance introduces a four-point framework around which the Minimum Standard Commitment are arranged and then set out Minimum Standard Commitments for seven sectors. The DAPS framework allows us to arrange practical standards under for heading of Dignity, Access, Participation and Safety.

Purpose

The research presents the content analysis of the Indonesian Red Cross (locally known as Palang Merah Indonesia or PMI) Psychosocial Support Group Session manual using the indicator of the Minimum standard commitments to gender and diversity in emergency programming. This manual is the guidance that used by the PMI PSP facilitator to manage the support groups session for the survivor that experienced critical incident.

The paper specifically discusses the potential adaptation of DAPS (Dignity, Access, Participatory and Access) commitment on the manual. The research question is which section are forms and examples of minimum standard commitment of gender and diversity into PMI Psychosocial Support Group manual. As for the approach used is a grounded theory approach to content analysis or content analysis.

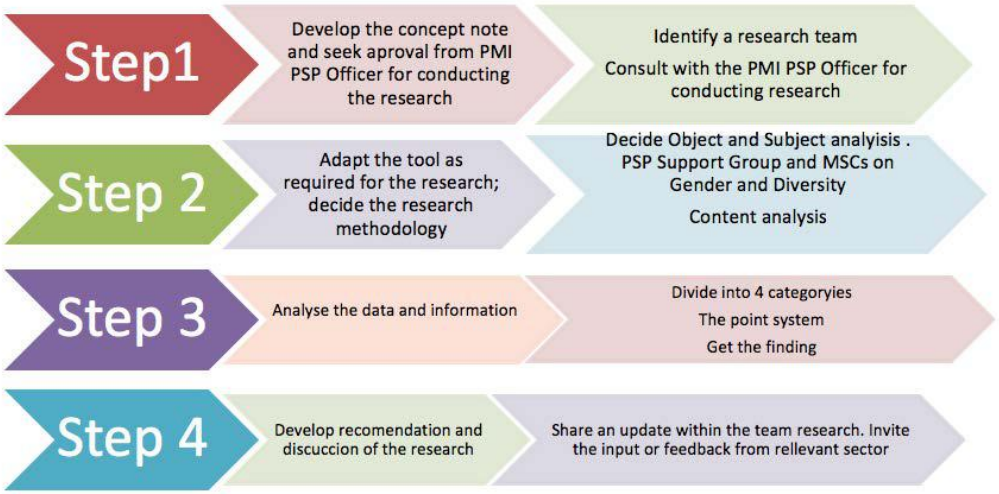
Methodology

Document Review

This study in practice uses a descriptive approach with content analysis. Content analysis is a research technique to make inferences that can be re-examined and valid from data based on the context of their use. Research conducted on information documented in the recording, whether images, sounds, writings, or others is commonly known as document research or content analysis (Suharsimi, 2009: 244). This research attempts to understand symbolic messages in a document. The symbolic message about dignity content, access content, content of participation and the safety from the Minimum Standard Commitment to gender and diversity in emergency programming (pilot version). The commitment specifically written on Emergency Health Programming, pages 14-18. The document to be analyzed were the Manual of the Support Group Session for PMI Volunteers (printed in 2011).

The main instrument used in this study is human instrument, namely the researcher themselves, with the knowledge, accuracy, and criticality of researchers looking for and digging to find the data needed in accordance with the research problems. Data collection techniques in this study were careful reading and recording of the manual.

Figure 1: Research Process



The step of content analysis is called mass observation results, which will be categorized as new hypotheses (Cohen & Manion, 1992, p. 49). In content analysis, the researcher made two observations: the first was done after selecting the document (manual). The purpose of the phase is to look at the manual to ensure that the documents contain the data sought in this study. Second, after the researcher observes the manual, the researcher will divide the contents of the guidebook according to the research instrument. This instrument divides the analysis into 4 different categories, such as commitment dignity, commitment access, commitment participation and commitment safety.

Table 1: The Research Instrument

Categories	Indicator
A. Dignity	**1.** Privacy related to the consulting rooms and toilets if the context required it. **2.** Health services and facilities to use **3.** Confidentially health services **4.** The informed consent usage **5.** Represented sex, Female health personnel are available to attend to female patients (Selection and mobilization of the facilitator are considered by gender)
B. Access	**1.** Non-discrimination **2.** Physical accessibility **3.** Economic accessibility/ affordability **4.** Information accessibility
C. Participation	**1.** Females and males are consulted and involved in the design of all health services and facilities. Where necessary, carry out single-sex focus group discussions with same-sex facilitators. **2.** balanced/fair representation in Assessment and response teams **3.** fair/balanced representation on the Community health committees **4.** Both female and male health workers are hired and trained.
D. Safety	**1.** Sector-specific safety issues **2.** Gender-based violence (GBV) prevention and response and child protection **3.** Internal protection systems

The Point System

Under each of 4 categories, there are several elements -referring minimum standard commitment to gender and diversity in emergency programming (pages 14-18). with a point system that is based on indicators of varying levels of advancement. For each element, the more indicators that are found, the more points it receives. In the comment fields, can write relevant information and cite specific evidence.

Point determination, using an ordinal scale

1 if it meets the criteria, shows findings

0 if you don't meet the criteria, become a recommendation

Example:

Table 2: Analyze Dignity Category

No	Indicator	Implementation in PMI Support Group Guideline	Point system	Comment
A1	Separate consulting rooms and toilets and, if the context requires it, separate entrances and waiting areas for females and males provide maximum privacy and dignity.	Yes Preparation related to the facilities found in page 8. Consulting room must be quiet enough, comfortable and away from the crowd	1 Finding	Pelaksanaan pada kegiatan dukungan kelompok pada staf dan relawan dan TKI korban bermasalah,
A4	Examinations and treatment are undertaken with the patient's informed consent.	No Recommendation	0	Needs analysis on prospective participants (attachment sheet 1) not included informed consent

Discussion

The research results are data from deep reading technique and analyses the content of the manual with the Minimum Standards. It is found that some indicator of the minimum standard commitment on gender and diversity are already adapted (form the findings). But some other indicator is become recommendation. The discussion is divided into 4 components:

1. Dignity

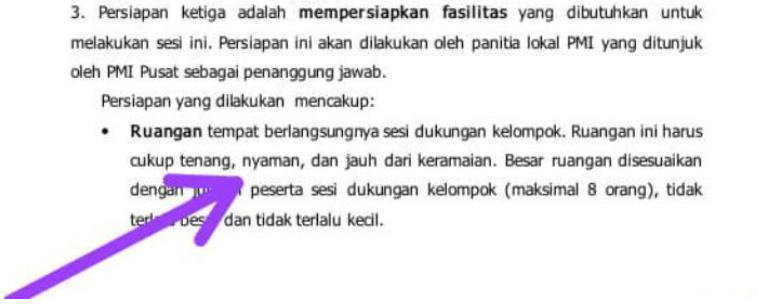
For the Red Cross and Red Crescent Movement, human dignity means respect for the life and integrity of individuals.

Findings Dignity

The dignity aspects that have been adopted in the Support Group Manual, namely:

a. Privacy related to the consulting rooms and toilets if the context required it.

Separate consulting rooms and toilets and, if the context requires it, separate entrances and waiting areas for females and males provide maximum privacy and dignity.


3. Persiapan ketiga adalah **mempersiapkan fasilitas** yang dibutuhkan untuk melakukan sesi ini. Persiapan ini akan dilakukan oleh panitia lokal PMI yang ditunjuk oleh PMI Pusat sebagai penanggung jawab.

Persiapan yang dilakukan mencakup:

- **Ruangan** tempat berlangsungnya sesi dukungan kelompok. Ruangan ini harus cukup tenang, nyaman, dan jauh dari keramaian. Besar ruangan disesuaikan dengan [illegible] peserta sesi dukungan kelompok (maksimal 8 orang), tidak terl[illegible] besar dan tidak terlalu kecil.

On page 8, there is a word "comfortable" for the room where the support group session will take place. Comfort is carried out by choosing a place that is closed, clean and quiet as far as possible.

The consultation room chosen in group support is separate from other activities. However, in the selection of participants, it did not separate between men and women, because of the critical incident criteria they experienced. For the staff and volunteer, the incident crisis mostly related to work experience when they mobilize to the disaster.

b. Confidential health services

7. Menyusun & menetapkan kesepakatan tentang aturan main sesi kelompok ini

Pemandu memberi kesempatan peserta sesi dukungan kelompok untuk mengungkapkan ide tentang aturan yang perlu disepakati kelompok supaya kegiatan dapat berjalan dengan baik sesuai tujuan. Setelah memberi kesempatan peserta sesi dukungan kelompok menyampaikan idenya, pemandu dapat menyampaikan ide mengenai aturan main sesi untuk disepakati kelompok.

Agar kegiatan ini dapat berjalan lancar dan memberikan manfaat bagi kita semua, perlu ada hal-hal yang diatur dan disepakati bersama.
Apa usulan anda masing-masing mengenai aturan untuk kita sepakati bersama ?

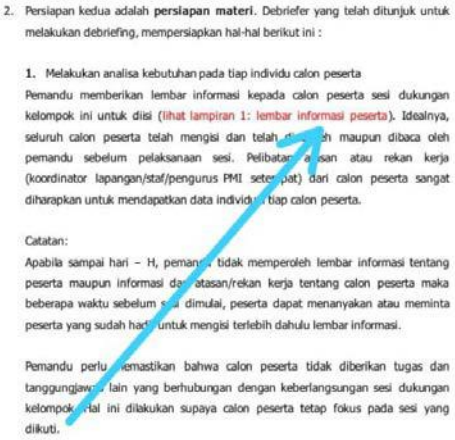
Setelah peserta sesi dukungan kelompok menyampaikan usulan dan menuliskan/mencatat usulan yang disepakati bersama, pemandu menyampaikan aturan penting lainnya yang belum disampaikan peserta sesi dukungan kelompok untuk disepakati.

Saya pikir perlu adanya kesepakatan kelompok mengenai hal berikut:
(kemukakan yang belum muncul dari peserta sesi dukungan kelompok)
a. Tidak diperbolehkan menilai dan menyalahkan orang lain.
b. Anda diharapkan mendengarkan dan memberikan kesempatan peserta sesi dukungan kelompok lain untuk berbicara.
c. Anda tidak dipaksa untuk mengungkapkan hal-hal yang tidak ingin anda sampaikan.
d. Anda berbicara atas nama diri sendiri, bukan mewakili orang lain
e. Jika anda merasa kesal/sedih/tidak nyaman karena keberadaan anda di kegiatan ini, upayakan untuk tetap berada dalam kelompok. Jika merasa perlu, anda boleh meninggalkan kelompok untuk sejenak menenangkan diri kemudian kembali lagi dalam kelompok.
f. Anda diminta mengikuti keseluruhan sesi
g. Keseluruhan isi dari sesi bersifat rahasia, tidak diperkenankan diperbincangkan di luar sesi.

Pemandu menanyakan kesediaan peserta sesi dukungan kelompok untuk mengikuti kegiatan ini dan kesepakatan kelompok.

Health services are confidential and the affected population trust that they are. On page 18, contains compiling and setting agreements about the rules of the support group session. The agreement made among them in point (g) describes the entire contents of the session as confidential, not allowed to be discussed outside the session.

c. Health services and facilities to use



2. Persiapan kedua adalah **persiapan materi**. Debriefer yang telah ditunjuk untuk melakukan debriefing, mempersiapkan hal-hal berikut ini :

1. Melakukan analisa kebutuhan pada tiap individu calon peserta
Pemandu memberikan lembar informasi kepada calon peserta sesi dukungan kelompok ini untuk diisi (lihat lampiran 1: lembar informasi peserta). Idealnya, seluruh calon peserta telah mengisi dan telah [illegible]h maupun dibaca oleh pemandu sebelum pelaksanaan sesi. Pelibatan atasan atau rekan kerja (koordinator lapangan/staf/pengurus PMI setempat) dari calon peserta sangat diharapkan untuk mendapatkan data individu tiap calon peserta.

Catatan:
Apabila sampai hari – H, pemandu tidak memperoleh lembar informasi tentang peserta maupun informasi dari atasan/rekan kerja tentang calon peserta maka beberapa waktu sebelum sesi dimulai, peserta dapat menanyakan atau meminta peserta yang sudah hadir untuk mengisi terlebih dahulu lembar informasi.

Pemandu perlu memastikan bahwa calon peserta tidak diberikan tugas dan tanggungjawab lain yang berhubungan dengan keberlangsungan sesi dukungan kelompok. Hal ini dilakukan supaya calon peserta tetap fokus pada sesi yang diikuti.

Health services and facilities are culturally-appropriate for females and males of all ages, including older people and people with disabilities to use.

Recommendation Related to Dignity

a. Informed Consent Usage

On page 7, the needs analysis for prospective participants (attachment sheet 1) is not included in the informed consent.

But ethically, informed consent is an obligation in a psychological intervention. This is related to the subject of its activities. Informed consent is made to protect the interests of both parties (facilitator and participant).

b. Represented sex, Female health personnel are available to attend to female patients, if the context requires (Selection and mobilization are considered by gender)

Page 7 mentioned PMI will appoint who will be the facilitator, by adjusting available resources.

In fact, selection and mobilization of the facilitators in support group session have not yet considered by gender.

2. Access

Findings Related to Access Indicator

a. Non-Discrimination

Page 6, there are participant criteria. It is same with the indicator the beneficiary selection and prioritisation criteria for accessing health services and facilities.

b. The health facility meets the 'minimum initial service package' (MISP) for reproductive health in crisis situations.

One important thing in support group is the provision of recommendations after the session. Support is not only psychological, but also related to other things.

c. Physical accessibility Health services are available and health facilities are accessible at times

Support group is a commitment from PMI to protect staff and volunteers that facing critical incident, especially who work after serving in disasters. This commitment is proof that through group support, PMI provides health services (psychosocial) that can be received as needed.

d. Economic accessibility/affordability

PMI support group session is a psychosocial support for the staff and volunteer. But in fact, PMI also serve the Women migrant worker with sexual violence with psychosocial support through support group.

e. Information accessibility

On page 21, there is psycho-education. It gives participants with knowledge about the impact of difficult experiences faced and efforts to overcome them.

Recommendations related to Access

a. Male and female interpreters are made available to those who need them

The selection criteria of facilitator are based on the competency. They will be assist by local volunteer who have a better information about socio cultural of the participant. However, due to constraints in the number of human resources, the assignment of the facilitator has not been considered by gender that this is important in specific cases like sexual violence.

b. Everyone, including those from marginalised groups, has access to confidential and culturally-appropriate reproductive health services

Page 34, reported data according to the ongoing session includes an open biodata of participants. Contains: name, gender, education, age, job, motivation. (P. 34). Page 36 are reporting the incident itself.

It is recommended that the facilitator should respect the confidentiality, based on the number and sex and age disaggregation of incidents of sexual and physical violence.

3. Participation

Participation refers to the full, equal and meaningful involvement of all community members in decision-making processes and activities that affect the lives of their survivors. Participation is a right and is very important for decision making, promoting protection and reducing feelings of helplessness; It is possible to use the insights, knowledge, capacity, skills and resources of affected people, empower female and male of all ages and backgrounds to rebuild self-esteem and self-confidence, and help survivors overcome traumatized by having to stay in displacement.

Actions in emergency response must maximize the participation of local people in their response. In designing the emergency response, the level of participation of female and male is also influenced by emergency situations which will affect the effectiveness of the program being prepared, so that different needs of female and male from various groups are emerging. To address the specific needs of individuals and communities requires structured dialogue. Participatory assessment involves separate discussions between female and male, including those from marginalized / marginalized groups.

Participation in disaster response is an important foundation for people's right to live with dignity that is affirmed in the Code of Ethics for the International Red Cross and Red Crescent Movement and Non-Governmental Organizations in Disaster Management.

The researcher carries out commitment analysis of anticipation in the book Guidance on group support for PMI volunteers with a standard minimum book commit to gender and diversity in emergency programming There are 4 items in the minimum standard only 1 (one) meets the criteria, namely that group support actors must pass the training process before being assigned to carry out a debriefing process, while the other 3 (three) items are not irrelevant to the process of group support activities. However, there is an interesting item to discuss, namely that group assumptions carried out by PMI have involved various age groups, and gender, but group support is not suitable for the age group of children so that the type of group support activities for child age groups should be considered child.

In the implementation of this group support the officers assigned to guide group support were not adjusted to the gender of the participants but based on the availability of officers at the time, so often the participants supported male groups with female guides or vice versa, so this would hamper the process group support becomes ineffective.

4. Safety

Female and male of all ages and backgrounds in affected communities have different needs in relation to their physical safety. Monitoring the security of the location of group support activities from various perspectives is very important to ensure that the assistance provided meets the needs of everyone in the same way.

Assessing security from a gender perspective and group diversity requires routine monitoring in all sectors.

In the book the minimum standard commitments to gender and diversity in emergency programming there are 3 (three) dimensions of safety, namely; (1) sector specific safety issue; (2) gender-based violence (GBV) prevention and response and child protection, (3) internal protection systems.

The following items are relevant to the group support book according to the 3 dimensions of safety namely; (1) sector specific safety issue; of the 5 (five) items in the book the minimum standard commitments to gender and diversity in emergency programming are only 1 (one) that is relevant to the information data of participants who will participate in group support sessions are presented in a complete and not confidential manner, according to drinking standards should be information participants are confidential and only certain parties, namely guides who can access, other items that need to be observed are lighting problems in the group support book mentioned in the room where the group support session takes place this room must be quite calm, comfortable and far from the crowd and the room size is adjusted to the number group support session participants (at least 8 people), in the implementation of group support from the experience the authors conducted group support sessions to select the room as a place for the group support session to not meet standards such as improper space / not prepared with poor lighting this will affect the process group support sessions in terms of both group and participant support guides.

Gender-based violence (GBV) prevention and response and child protection; almost all items in the book minimum standard commitments to gender and diversity in emergency programming do not match the context of group support, the entry point is the referral system if a case is found that indicates the group support session participant must be referred to a professional or hospital.

internal protection systems; almost all items in the book minimum standard commitments to gender and diversity in emergency programming are not in accordance with the context of group support, the entry point is the Indonesian Red Cross (PMI) has a Code of Ethics, know the Child Protection Policy and staff and understand it.

Conclusion

The research findings are that DAPS (Dignity, Access, Participatory and Access) as the indicator of minimum standard commitment to the gender and diversity in emergency programme, pilot version (published by IFRC publication in 2015) are already adapted into the manual of Support Group Session of PMI Psychosocial Support Programme. It is found that, support group not only given to PMI staff and volunteer, but it is also used as the guidance of the rehabilitation join program between PMI and BNP2TKI, to the women migration worker with the problem. One of more facing the sexual violence.

The research has answer the question which section (on the manual) that are forms and example of minimum standard commitment of gender and diversity. The aspect which has not been included yet in the manual is related to the safety. It's found that data of the survivors (especially who have been exposed by sexual violence) who joined the support group session are still with name instead only by the number of incident, sex and age disaggregated. The important recommendation related to dignity are the support group has provided an informed consent to the participant. Because the interventions are related to humans, so informed consent will protect the interests of both parties.

This research may provide the first step to give the idea of survivor centre approach into the Psychosocial debriefing program of Indonesian Red Cross, especially for the survivor of sexual and gender-based violence. Although PSP PMI conducts group-based activity, the principle of confidentiality; gender and diversity could be a positive thing to adapt.

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ABSTRACT ONLY – Why and how does the risk to gender-based violence increase during disasters? Evidence from the Philippines, Indonesia and Lao PDR

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International Federation of Red Cross and Red Crescent Societies

Abstract

Considering that gender-based violence (GBV) is the leading cause of death among women aged 18-441 (in some countries), that at least one-third of women experience some type of GBV in their lifetime (WHO, 2016)2 and that Asia Pacific is the most disaster-prone region in the world (UNNC, 2016)3, it is crucial to assist both female and male GBV survivors with stronger support mechanisms during disasters and other emergencies.

GBV is often life threatening and impacts a survivor's daily life, dignity, rights, livelihoods and health. SGBV during and after disaster situations and other emergencies is under-researched and largely ignored in policy circles4. Consequently, the primary research question for this paper is: Why and how are the risks to gender-based violence exacerbated during disasters?

This research project applied mixed methods, including data analysis and results from quantitative household surveys with disaster affected men and women; qualitative focus groups discussions with disaster affected men, women, adolescent girls and adolescent boys; and key informant interviews with frontline disaster responders in the health, psycho-social support, legal and security sectors. A coordinated community intervention as a theoretical lens and disaster law as a tool is explored for better coordination and collaboration among disaster responders. The research scope is limited to select data collection sites in three country contexts: Philippines, Indonesia and Lao PDR. Results illustrate that primary prevention interventions, long-term community –based programmes addressing behaviour change towards gender inequality and a more coordinated response by both governmental and non- governmental disaster responders would aid in decreasing the risk to gender-based violence during disasters.

Key words: Gender-based violence, increased risk, disasters, systems change, primary prevention, survivor needs

Disclaimer: The results of this research are partially based on a collaborative research project conducted by the International Federation of the Red Cross and Red Crescent (IFRC) and the ASEAN Committee for Disaster Management (ACDM). The author of this paper is also the lead author for the IFRC-ACDM report. Please find the final report here.

ABSTRACT ONLY – Recognizing Women and Marginalized Communities' Perspective in Disaster Risk Reduction. Case Study: Bandar Lampung City, Indonesia

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Abstract

Gender mainstreaming and social inclusion in policy is especially important as a way to represent women and marginalized communities' perspectives to recognize different needs and capacities. This article is a case study on gender mainstreaming and social inclusion within DRR framework in Bandar Lampung City. It follows two main steps which involve disaster risk assessment in the city, followed by identification of existing policies and infrastructures in addressing gender and social inclusion into DRR in the built environment. The study is conducted through both primary and secondary data collection. A secondary data collection includes the analyses of existing documents on city's disaster risk profile, local regulations, documents, while primary data collection was done through focused group discussion. In Bandar Lampung, the level of seasonal rainfall intensity is declining in every season; which lead to increase of flood, flash flood, drought, and extreme weather probability increase each year. Meanwhile Indonesian women's participation in community meetings to identify infrastructure priorities was lower than for other components. While there are some policies mentioning social-inclusion in development, there are no relevant gender-sensitive budget policy or specific affirmative actions for women and marginalized groups in DRR yet.

Keywords: gender mainstreaming, social inclusion, vulnerability, disaster, capacity

ABSTRACT ONLY – Good Practices and Reflections of Gender and Diversity Mainstreaming in Disaster Risk Management Systems and Climate Change Adaptation: Vietnam Case Studies[1]

Warittha Wannathong, Napapan Der Kinderen, and Quyen Nguyen

Asian Disaster Preparedness Center

Abstract

Significant of the Study: Although the government of Vietnam has made a lot of effort in mainstreaming gender equality in overall develop initiatives, particularly in DRR/M system and CCA at policy level, such initiatives could not fully implement at practical level, particularly at community level. This is because the existing gender barriers, including Vietnamese culture and norms that already defined men to serve leadership roles and responsibilities between men and women, and traditions and norms about the role of women in every Vietnamese society. In order to reduce male-dominated cultures in every society, it is totally vital to break the norms and cultures that hindering gender equality. Also, using technology and having women and different groups engaging in GIS Application is one of the good practices in building inclusiveness in conducting decision-making process and leadership building in water management and drought forecasting in Vietnam. Key recommendations are included: (1) Breaking gender norms and promoting the sharing of household responsibilities between women and men and ensuring that both gender and other diverse groups must have the right to be involved in decision-making regarding climate and DRR policies at all levels. The equal participation of women and men enhances the legitimacy of DRR/M and CCA policy and builds a sense of ownership among gender; (2) Using and promoting technologies as the tool for accessing resources and power in decision-making can be one of the options in allowing women to engage in DRR/M and CCA without considering physical condition as women, youths, disable and elderly persons can use and access technologies as well and (3) National laws, policies and mechanisms should respond to the needs and capacities of everyone.

Hypothesis: The more gender and diversity mainstreaming by using localization approach into initiatives and interventions of national policy and legislative frameworks on DRR/DRM systems and CCA, the more climate resilient communities can be built in Vietnam.

Goals and Objectives of the Study: This study has a vital goal to explore good practices and reflections on the implementation of such policy and legal frameworks on gender and diversity mainstreaming in DRR/M and CCA. Furthermore, this study also aims to propose possible and practical implications for operative and effective implementation of related national legal and policy frameworks and mechanisms for building a more climate-resilient community in Vietnam.

Research Questions: (1) What are the existing legal and policy frameworks and mechanisms that complimenting gender and diversity mainstreaming in DRR and CCA in Vietnam?; (2) What are interventions, good practices, reflections and existing challenges and/or difficulties from key stakeholders in conducting gender mainstreaming in DRR and CCA in Vietnam?; (3) What are the further recommendations and suggestion for further research and interventions in strengthening gender and diversity mainstreaming in DRR and CCA, and strengthening gender resilient in Vietnam?

Research Methodology and Conceptual Frameworks for Analysis: Qualitative research method with (1) desk research (i.e. research, review international, regional, national legal and policy frameworks, mechanisms, reports and case studies related to G&D mainstreaming in DRR/M and CCA issues); (2) field research (i.e. FGDs and in-depth interviews of key informants) and (3) conduct analysis by using gender analysis frameworks of USAID and SIDA and an analysis framework for DRR/M and CCA: Pressure and Release (PAR) Model by Wisner et al. 1995.

Scoping of the Study: This consists of four main parts, including: (1) National legal, policy frameworks and operational mechanisms and systems; (2) Interventions, good practices and reflections, challenges and difficulties and (3) Recommendations and way forwards.

Limitation of the Study: This study has limitation of budget so only desk research and in-depth interview of Vietnam key informants and some FGD can only be done in Bangkok, Thailand and Hanoi, Vietnam.

1. *Disclaimer: The views and opinions expressed in this article are those of the authors and do not reflect the Asian Disaster Preparedness Center's policies nor opinions.*

SUB-THEME 3

Post-Haiyan Evaluation of Development Aid Projects and Disaster-Resilient Community Index in Tacloban City, Leyte, Philippines

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United Nations Development Programme

Abstract

The Philippines is exposed to the direct and indirect effects of typhoons and associated hazards such as floods and storm surges due to its location. On 8 November 2013, Typhoon Haiyan, one of the strongest storms recorded with wind speeds of more than 300 km/h and storm surges which reached as high as 4 meters, made its landfall in the Philippines. Tacloban City was one of the hardest hit areas because of its location and weak coastal areas. Given the magnitude of Typhoon Haiyan, local and international aid agencies extended its assistance in delivering rehabilitation and recovery projects to the community. This study assessed whether the development aid projects and activities are relevant and effective in building resilient communities. It also evaluated the effectiveness of post-disaster initiatives in achieving its intended outcomes and promoting resilience using the 2014 Disaster-Resilient Community Index (DRCI). The findings revealed that the presence of assistance has contributed to the psychological and social resilience in Tacloban City. The DRCI of Tacloban City has increased from 0.52 index value in 2014 to 0.859 index value in 2017, which can be attributed to the improvement of the thematic areas of disaster-resilient communities such as governance, risk assessment, knowledge and education, risk management and vulnerability reduction, and disaster preparedness and response.

Keywords: community resilience, Typhoon Haiyan, development assistance

Introduction

The Philippines is situated within the path of seasonal typhoons and monsoon rains, which may result to flooding, storm surges, and other forms of disasters (Capistrano, 1998). Based from the World Risk Report 2017 (Bündnis Entwicklung Hilft, 2017), the Philippines with 52.46% exposure, ranked third among countries with the highest exposure to risks. When Typhoon Haiyan hit the country, it has strengthened the need to build more resilient individuals, communities, and infrastructure. Tacloban City was identified as the area to focus on since its location, as well as its low-lying landscape meant that it was one of the mostly-affected areas in Leyte province. Paragas, Rodil, and Pelingon (2016, p.11) mentioned that Tacloban City is susceptible to the direct and indirect effects of the typhoons that hit the Philippines each year. The city is also in danger of experiencing tsunamis with even wider inundations than storm surges.

This study assessed the relevance and effectiveness of development projects and activities in promoting psychological and social resilience and evaluated the effectiveness of the post-disaster initiatives in achieving its intended outcomes and promoting resiliency based on the 2014 DRCI. Florano (2014) formulated DRCI to examine the role of community governance in disaster recovery and resilience. It was based in the priority actions outlined in the Hyogo Framework for Action (HFA).

Resilience in this study is defined in line with development management perspective wherein the elements of enabling environment, range of actors, and institutions are involved. It is not a one-time effort that can arise from a single approach, but an ongoing community process, resulting from a combination of approaches.

Graber, Pichon, & Carabine (2015) defined psychological resilience as “a developmental and psychosocial process through which individuals exposed to sustained adversity or potentially traumatic events experience positive psychological adaptation over time”. Psychological resilience also depicts the durability of an individual to face shocks and stresses, and the capacity to bounce back and recover from perturbation (Manyena & Gordon, 2014).

On the other hand, social resilience is measured by time, particularly as to how long would the community take in order to respond to the event, to self-organize, and to incorporate the lessons learned prior to returning to a new normal way of functioning. The longer time it takes to recover, the community will most likely experience psychological and emotional distress (Sapirstein, 2006).

Method

The primary data were gathered using two sets of survey instruments. The first set was constructed using the 5-point Likert scale and was administered to 135 respondents who received development assistance from several development aid agencies. Stratified random sampling was used to obtain the sample of the study. The strata used were the different types of assistance: 1) livelihood which includes agriculture, aquaculture, and MSMEs, and 2) social which includes education and health. This method was employed since it has a higher statistical precision, which means it would require a small sample size and can save time, money, and effort. It was designed to assess the relevance and effectiveness of development aid projects and activities in promoting psychological and social resilience in Tacloban City. The Chi-square test of independence at significance level of 5% was used to determine if there is a significant relationship between the variables of resilience contexts.

The second set used semi-structured questionnaires, which also served as an interview guide. It was administered to 1 barangay captain and 7 barangay councilors from each barangay in Brgy. 61 (Sagkahan), Brgy. 68 (Anibong), and Brgy. 86 (San Jose), Tacloban City, Leyte. These barangays were chosen due to the severity of the damages and casualties they sustained after Typhoon Haiyan. The DRCI was derived by accumulating the scores from a variety of individual items. The items with Yes answers were added together, and the sums were used as scores for each indicator.

The DRCI was first used in 2014 to measure the resilience of communities to disasters in the following cities in the Philippines: Tacloban City, Iligan City, Dagupan City, and Marikina City. Among other indices, the researcher chose DRCI and used the same parameters and scoring system to measure the resilience of Tacloban City, four years after it was first administered.

$$DRCI = \sum (GOVw1 + RASw2 + KAEw3 + RMVRw4 + DPRw5)$$

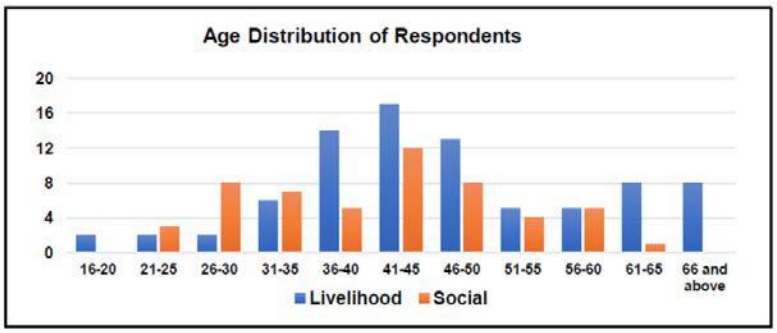
where: DRCI = disaster-resilient community index

GOV = index value in governance
RAS = index value in risk assessment
KAE = index value in knowledge and education
RMVR = index value in risk management and vulnerability reduction
DPR = index value in disaster preparedness and response
Wn = weight assigned to each thematic area

Results

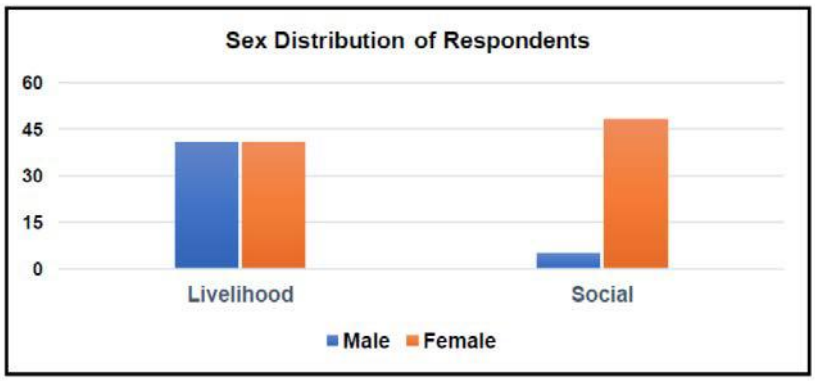
A total of 135 beneficiaries under livelihood and social components were interviewed. The beneficiaries were randomly selected within and outside the three chosen barangays in Tacloban City. In terms of age distribution, the age bracket 41-45 years old has the highest frequency for both livelihood (20.73%), and social (22.64%). While the age brackets with the lowest frequency for livelihood were 16-20 (2.44%), 21-25 (2.44%), and 26-30 (2.44%) years old. For social, there were no respondents in the age brackets 16-20 and 66 and above.

Figure 1: Age distribution of Respondents



In terms of sex distribution, 50% are male and 50% are female in the livelihood component. Majority of the respondents in aquaculture are male, while in MSME and agriculture are female. On the other hand, 9.43% are male and 90.57% are female in the social component. The health and education sector are mostly occupied by female workers.

Figure 2: Sex distribution of respondents



The average monthly household income distribution has increased after receiving livelihood assistance. The restoration and strengthening of livelihoods of micro-entrepreneurs, farmers, fisherfolks, among others through the provisions of equipment and facilities, improvements in value-chain and access to markets, and skills training allowed them to gain additional income and generate employment.

Figure 3: Average monthly household income before and after receiving livelihood assistance

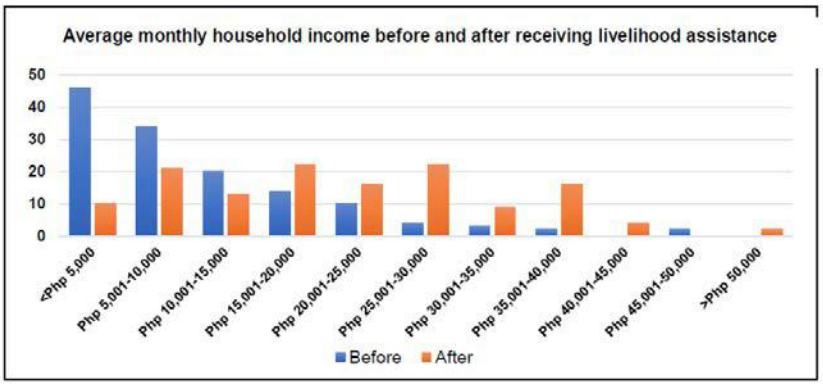


Figure 4: Psychological resilience before receiving development assistance

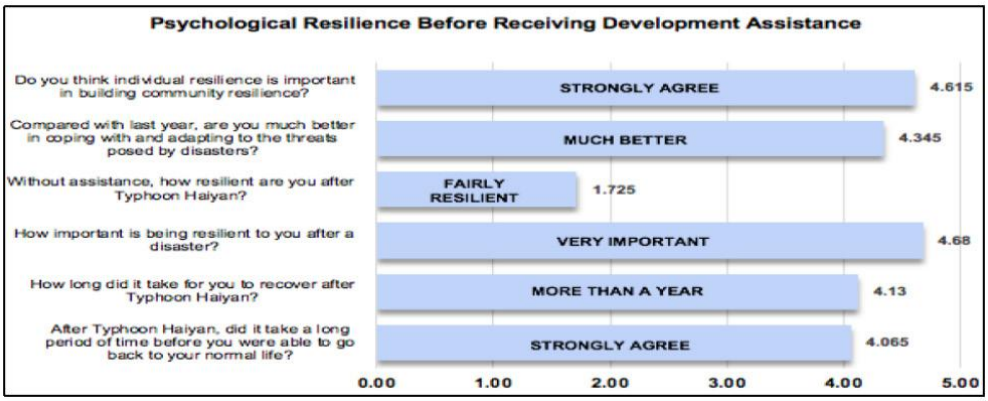


Figure 5: Psychological resilience after receiving development assistance

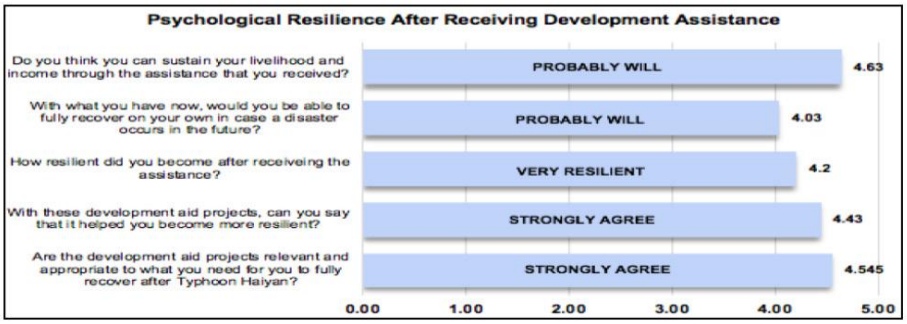


Figure 6: Social resilience before receiving development assistance

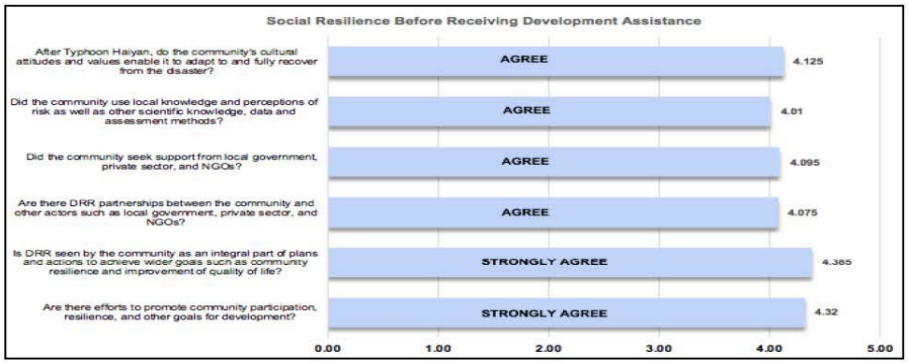


Figure 7: Social resilience after receiving development assistance

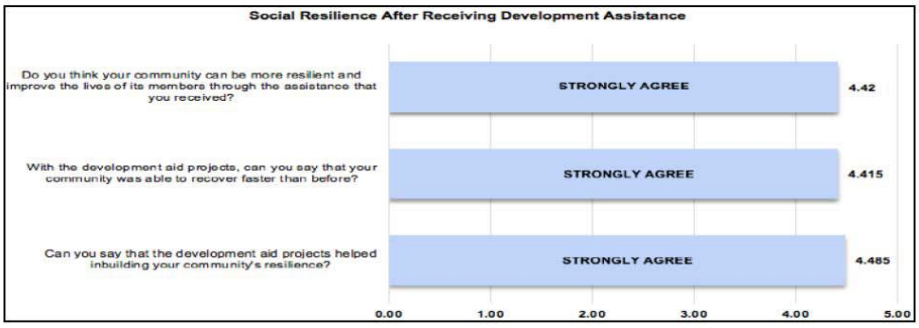


Table 1. Chi-square test of independence between importance of individual resilience in building community resilience and presence of efforts to promote community participation, resilience, and other goals for development

	CHI-SQUARE STATISTIC	DF	P-VALUE*
Pearson Chi-Square	6.6462	1	0.009937

*p < .05

Reject H_o since the p-value (0.009937) is less than the significance level (0.05). In order to have a strong resilience system in the community, individual resilience is essential. The respondents realize that individual resilience is necessary to overcome adversity for the well-being of their community. Community resilience requires people to come and work together. In order to achieve this, they put their efforts to promote community participation, resilience, and other goals for development.

Table 2. Chi-square test of independence between the ability of the individual in coping with and adapting to the threats posed by disasters and the community's cultural attitudes and values which enabled to adapt to and fully recover from the disaster

	CHI-SQUARE STATISTIC	DF	P-VALUE*
Pearson Chi-Square	10.6935	1	0.001075

*p < .05

Reject H_o since the p-value (0.001075) is less than the significance level (0.05). The cultural attitudes and values of people in Tacloban City such as finding strength in faith, being resourceful in order to survive with whatever they have and being able to find humor in everything served as their coping mechanism in order to survive. Also, the assistance they received from the government and various aid agencies enabled them to become much better in coping with and adapting to the threats posed by disasters.

Table 3. Chi-square test of independence between DRR is seen by the community as an integral part of plans and actions to achieve wider goals and the efforts of community in building infrastructure and basic services that are resilient to disaster

	CHI-SQUARE STATISTIC	DF	P-VALUE*
Pearson Chi-Square	22.7764	1	0.000002

*p < .05

Reject H_o since the p-value (0.000002) is less than the significance level (0.05). Typhoon Haiyan was an eye opener that investing in DRR is no longer an option, but a priority given its effects. With this, DRR is seen by the community as an integral part of plans and actions to achieve wider goals such as community resilience and improvement of quality of life. The community started building infrastructure and basic services that are resilient to disaster. The buildings and facilities being reconstructed now are enhanced and retrofitted to withstand future disasters with at least the same or higher intensity as Typhoon Haiyan.

Table 4. 2017 Disaster-Resilient Community Index in Tacloban City

THEMATIC AREAS	WEIGHTS	2014 DRCI	2017 DRCI
Governance (GOV)	16%	0.12	0.14
Knowledge and Education (KAE)	23%	0.09	0.19
Risk Assessment (RAS)	9%	0.04	0.08
Risk Management and Vulnerability Reduction (RMVR)	23%	0.09	0.19
Disaster Preparedness and Response (DPR)	29%	0.18	0.25
Total	**100%**	**0.52**	**0.85**

Discussion

Evaluation of Development Aid Projects

The development aid projects from local and international agencies such as livelihood, social, temporary shelters, and financial assistance has contributed to different resilience contexts. In terms of psychological resilience, the respondents believe that it will take a longer period of time before they can able to go back to their normal lives without the assistance. It took more than a year for them to recover after Typhoon Haiyan. They also mentioned that being resilient is important to them and that individual resilience is important in building community resilience. At this point, they are now resilient, and much better in coping with and adapting to threats posed by disasters. Also, the projects were relevant and appropriate to what they need in order for them to fully recover and helped them become more resilient after Typhoon Haiyan. They will probably be able to fully recover in their own and sustain their livelihood and income through the assistance they received. In terms of social resilience, the respondents perceived that even without the assistance, there were efforts to promote community participation, resilience and other goals for development because these were necessary to bounce back and recover quicker. Also, DRR is seen by the community as an important part of plans and actions to achieve community resilience. There were also DRR partnerships between the community and other stakeholders. The community used local and scientific knowledge, data and assessment methods, and the cultural attitudes and values enabled them to adapt and fully recover from Typhoon Haiyan. The assistance helped in building the community's resilience, enabled them to recover faster than before, and improve the lives of its members.

Disaster-Resilient Community Index

The improvement in Governance (0.14) can be attributed to the presence of Barangay Disaster Risk Reduction and Management Committees and BDRRM Plan. The barangay officials ensured that they understand the laws, rules and regulations, and have a long-term perspective about the effects of disaster risk reduction and climate change adaptation. They also have existing partnerships with NGOs, CSOs, and other agencies. They have the capacity to train and encourage volunteers in their communities to participate in their advocacies in Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA). However, their disaster recovery fund is insufficient. They need more funding and access to adequate financial resources to carry out risk reduction activities, including effective disaster response and recovery.

The improvement in Knowledge and Education (0.19) can be attributed to the enhancement of public awareness, knowledge, and skills in Tacloban City regarding disasters and community vulnerabilities. The information on risks and disaster management practices are communicated to the community. They now do precautionary measures to lessen the risks that disasters might cause in the future. However, they still lack some of the resources and other needed support to ensure their safety during disasters.

The improvement in Risk Assessment (0.08) can be attributed to the carrying out of hazard and risk assessments in the barangays. The findings of these assessments are integrated into their disaster planning and the findings are shared and discussed among the relevant stakeholders. However, the skills and capacity to carry out the assessments are not regularly maintained due to limited support and training.

The improvement in Risk Management and Vulnerability Reduction (0.19) can be attributed to the incorporation of barangay disaster plan in the city development plan and Comprehensive Land Use Plan (CLUP). In making decisions on land utilization and management, the barangay officials consider the hazards and risks caused by the disasters. Most of the residents have the ability to construct and repair their houses but some of them do not have the financial capacity to invest in a more disaster-resilient structure. They also do not have access to affordable life and home insurances. Belonging to the low-income group could explain as to why they are less likely to have savings, insurance, and access to formal credit to restore their physical assets. They are more likely to experience prolonged periods of recovery.

The improvement in Disaster Preparedness and Response (0.25) can be attributed to the coordination and decision-making between the barangays, local officials, and NGOs. The community has sufficient number of officials and residents trained in relevant skills such as search and rescue, communication, first aid, and relief distribution. They also have a community-based early warning system in place to send messages which are understood by the community. There is participation in crafting and implementation of contingency and disaster plans in the community as compared before Typhoon Haiyan hit Tacloban City. After experiencing Typhoon Haiyan, regular training activities and emergency drills are being conducted every quarter. The barangay officials pointed that they still need to improve their psychosocial support within their barangays to provide counselling to the residents who experienced trauma and health problems from the devastation caused by disasters.

Overall, the study concludes that the improvement in the level of resilience in Tacloban City based in the 2017 DRCI means that the communities are leaning towards the achievement of resilience outcomes such as the ability to adapt to change, manage hazards, sustain livelihood, and move out of poverty in the long run. Only natural disasters such as typhoons and associated hazards such as floods and storm surges were included in this study. Some other factors such as the attribution to other similar rehabilitation and recovery programs that might be beneficial or detrimental to the community were not included.

Recommendations

The development aid agencies provided programs and projects to address the needs of Typhoon Haiyan survivors in Tacloban City. However, there are areas in disaster governance in which Tacloban City still needs to focus on and improve. The results in DRCI may be used to determine which thematic areas have low index scores, so that next time these agencies will provide assistance, they can focus the design and implementation of projects for the improvement of those areas, which in the long run can improve the psychological and social resilience.

1. One of the indicators under risk management and vulnerability reduction which is the access of the barangay to affordable insurance got a low index score. Aside from providing skills training in aquaculture, agriculture, MSMEs, and linking the beneficiaries with a couple of microfinance institutions to expand and diversify their operations, the development aid agencies may assist the beneficiaries to increase their access to affordable insurance and access to credit. When a disaster hit these groups, they have no choice but to sell their assets in order to sustain their everyday consumption and to repay their loans, and thus they cannot have access to credit. Linking them to a microfinance institution can help them start or expand income-generating activities. Microinsurance should be seen as an essential part of risk management in support to the government's effort in DRR and CCA.
2. Several indicators under disaster preparedness and response got low index scores. The first one is the ability of the barangays to manage crises on their own. The development aid agencies may contribute in enhancing the disaster preparedness and response capacities of vulnerable communities and barangay officials through participatory crises assessment, while raising the awareness of post-disaster protection concerns, such as people being separated from their families, designation of unsafe areas after a disaster, and providing emergency relief supplies. The other one with is the capability of the barangays to provide psychosocial support or counselling. This can be addressed through a community-based psychosocial support program which allows the community to identify the causes of trauma and the solutions, to consider the previous experiences of the affected community, and to participate in making decisions on its environment, welfare, and quality of life. This may include training of community health workers building local health facility capacity and increasing community knowledge of psychosocial process.
3. Tacloban City LGU can incorporate the Sendai Framework in their DRR and CCA plans. Focusing in the enhancement of disaster preparedness for effective response, and to build back better in recovery, rehabilitation, and reconstruction may be done. Build back better is a comprehensive approach to ensure that the resilience of the affected community is restored in preparation for the future. However, majority in Tacloban City still follows the building back principle. They need to strictly implement and monitor regularly the compliance of new and existing infrastructures to build back better principle to ensure the continuity of operations and planning and remain secured during and after disasters.
4. The barangay officials mentioned that they do not have enough financial resources to carry out risk reduction activities, including effective disaster response and recovery. In order to maximize the use of funds to support DRR and CCA projects and programs, they may consider public-private partnerships (PPP). PPPs should be strengthened because collaborating with various private partners will work towards the path of resilience. With PPP, the projects in Tacloban City will be funded and managed by the private sector, while the LGU will be responsible for the delivery of the projects. However, the LGU must also be cautious so that big corporations will not be able to take advantage of the smaller ones and work for their own benefit.

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Flood-prone communities' awareness and assessment of the risk communication systems of Davao City, Southern Philippines : An Exploratory Sequential Research

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Abstract

Disaster Risk Reduction Strategies can be enhanced through proper knowledge transfer of disaster communication from the different concerned agencies to the communities that would eventually implement the procedures presented therein. Recent studies on risk communication flow revealed that some problems occur in the reception due to the lack of a harmonized understanding on the concept of flooding. Consequently, making the communication tools and DRR strategies irrelevant to the target recipients. More importantly, there is an observed lack of community-based protocols for risk communication at the community level.

Purpose of this research, therefore, is to answer the need to help develop a community-based risk communication protocol utilizing the knowledge systems relevant to the communities as well as identify the possible factors that affect the communication transfer from the source to the target audience. Moreover, to recommend a City Ordinance that would institutionalize a "localized" or community-based DRR communication protocols in Davao City, Southern Philippines --- a policy challenge posed by the 2011 flash flood incident.

A mixed methods research, specifically, the exploratory approach was utilized in this research, guided by Creswell's idea that it is a better approach to employ strategies or inquiry that involve collecting data sequentially to best understand the research problem. The qualitative phase determined the risk communication systems approach using Key Informant Interviews (KIIs), Focus Group Discussions (FGDs) and evaluation of the risk communication systems at the community level. The quantitative approach using a multi-stage cluster sampling was employed in this study and determined the profile, the risk perception, response to flooding and communities' assessment of the communication systems at the community level. The data from the City Disaster Risk Reduction Management Office (CDRRMO) was utilized and from the KII, top five (5) barangays were identified by the CDRRMO as the flood-prone areas in Davao City.

Furthermore, local government units prioritized the top five zones (puroks) as highly critical to flooding. Thus, the total population considered for the sampling frame was 6177 households. Using proportional allocation, a sample of 376 was determined. The simple random sampling and randomization procedure of HH intervals helped identify the specific households as the respondents of the survey and the FGDs, giving each household equal chance to be selected. Moreover, the integrated findings will be used to recommend a City Ordinance that would institutionalize a "localized" or community-based DRR communication protocols in Davao City, Southern Philippines.

Keywords: disaster risk communication, disaster preparedness, crowdsourcing, social media, disaster management, digital technology

Introduction

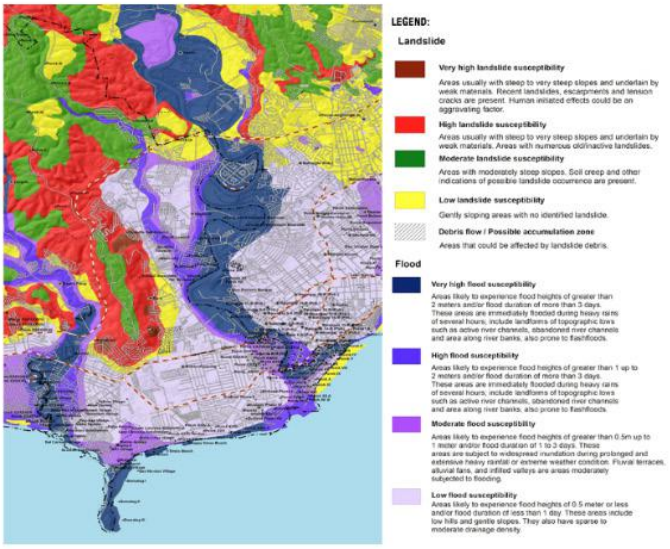
The Philippines, unlike other countries in Southeast Asia, is not only exposed to tropical storms, but also to many other climate-related hazards especially floods and landslides due to the terrain of the country, which makes the country one of the most vulnerable to climate change. Incidentally, climate change has created a big impact in Mindanao, having experienced a few tropical storms and typhoons in the past and its entry points are usually the north-eastern and south-eastern parts of Mindanao. Sanchez and Sumaylo (2015) enumerated that in 1970, Typhoon Titang hit the north-eastern part of Mindanao, which caused Lake Mainit to overflow while Typhoon Nitang in 1984 struck south-eastern Mindanao, killing 1,400 people. However, typhoons and tropical storms of such strength and area span as that of typhoon Bopha (Pablo) and tropical storm Washi (Sendong) are not common at all in the island. The alarming frequency and magnitude of these natural calamities makes low-lying areas susceptible to flash floods and its coastal areas vulnerable to tsunamis (Carrasco, Ochiai & Okazaki, 2016).

Davao City, in particular, is considered as one of the largest cities in the world with an area of 244,000 hectares (Figure 1). It constitutes 8% of the land area of the Southern Mindanao region. Its location outside the typhoon belt makes it the fruit basket of the Philippines. The entire area of city, however, primarily drains itself towards the Talomo river and the Davao Gulf considered as the two most important river basins which has the largest catchment area of about 1,647 square kilometres. Along with this basin is its sub-basin, the Matina river basin. Hence, the disaster vulnerability of some areas in Davao City reflects that majority of the barangays are prone to flooding incidents (Figure 2). The city covers a total of 182 barangays, 63 of these have been considered as flood-prone areas. Despite the fact that Davao City is considered a typhoon-free city, it has not been spared of the devastating flash flood on June 28, 2011, its gravity has been found to be incomparable to the previous flooding experiences of the city. Although records will show that flooding and landslides have been a repeated occurrence in Davao City (CDRRMO, 2011), the flash flood of 2011 has created an impact that shows the need for a policy challenge on the disaster preparedness and response at the community level.

Notwithstanding the presence of the city's Central 911 and the efforts exerted towards disaster preparation, the outcome of this incident revealed that there is still a low awareness and level of perception of risk among the communities which was reflected by the effect of the 6-hour gap between the disaster incident and the arrival of the response team. Furthermore, studies related to this incident (Estacio, 2013; Sanchez, 2014; Sanchez & Sumaylo, 2015) reveal that there was a lack of communication protocols that led to the negative impact of the disaster.

Figure 1: Locator map of Davao City, Philippines

Figure 2: Davao City Hazard Map



This study utilized a mixed method sequential approach in three stages: a qualitative approach utilizing document reviews of policies and Key Informant Interviews (KII) to establish the role of the institutions in disaster communication; a quantitative approach utilizing survey for the reception analysis among the flood-prone communities as a baseline data for policy recommendation and finally the development of a community-based framework in the management of risk communication.

Disaster studies emphasize the significant role of risk communication (Comfort, et.al., 2008; Mercado, 2016; Pidgeon, Kasperson & Slovic, 2003; Kasperson, 1988). Disaster Risk Reduction Strategies can be enhanced through proper knowledge transfer of disaster communication from the different concerned agencies to the communities that would eventually implement the procedures presented therein. Consequently, focusing on how the communication tools and DRR strategies can be made more relevant to the target recipients.

This academic paper, therefore, highlights the results on the risk perception and awareness level of the flood-prone communities of the risk communication systems and to assess the level of intervention being done at the barangay levels. This is in response to the observed lack of community-based communication protocols and management at the community levels. Ultimately, the results of this area of study can provide a baseline data for proposing a Community-based City Ordinance institutionalizing the "localized level" of communication protocol in Davao City which can be translated into a strategy for risk reduction at the level of the communities.

A. Statement of the Problem and Objectives

The two national policies the Climate Change (CC) Act or RA 9729 of 2009 (RP.gov.ph, 2012) and the Disaster Risk Reduction and Management (DDRM) Act or RA 10121 of 2010 (RP.gov.ph, 2012) states that the Local Government Units (LGUs) shall be the frontline agencies in the formulation, planning and implementation of climate change and disaster risk reduction plans in their respective areas, consistent with the provisions of the Local Government Code, the CCA and DRRM frameworks and the National Climate Change and

Disaster Action Plans. The barangays shall be directly involved with the municipal and city governments in prioritizing climate change and disaster-related issues and in identifying and implementing best practices and other solutions (Delos Reyes & Francisco, 2015). The National Disaster Risk Reduction and Management Plan (NDRRMP) for 2011-2028 was created. It enumerates the general framework of implementation of RA 10121 highlighting the systematic and integrative approach and the role of LDRRMC. The NDRRMP provides a general framework that aims to develop "safer, adaptive, and disaster resilient Filipino communities towards sustainable development" by promoting "internal socio-political stability" (NDRRMP Manual, ND).

Purpose of this research, therefore, is to answer the need to help develop a community-based risk communication protocol utilizing the knowledge systems relevant to the communities as well as identify the possible factors that affect the communication transfer from the source to the target audience. Moreover, to recommend a City Ordinance that would institutionalize a "localized" or community-based DRR communication protocols in Davao City, Southern Philippines --- a policy challenge posed by the 2011 flash flood incident.

B. Scope and Delimitation

The survey was conducted in the months of November 2017 to February 2018. The targeted 90-day fieldwork has been extended due to the disruptions brought about by the flooding incidences in December and January that required respondents to evacuate from their residences. In addition, instead of a self-administered survey, an enumerator was sought to assist the researcher in the house-to-house survey to ensure open ended questions will be addressed. Moreover, a triangulation was done by conducting follow-up Focus Group Discussions (FGDs) among the residents of the flood-prone areas, the selection of the participants, however, was decided by the zonal leaders (purok leaders). This set of participants does not necessarily involve all the respondents of the survey. In addition, since the researcher is not a native speaker of the dialect, the conduct of the FGDs were assisted by a facilitator to allow open and free discussions among participants. Consequently, the facilitator also transcribed the FGD proceedings with English translations.

Materials and Methods

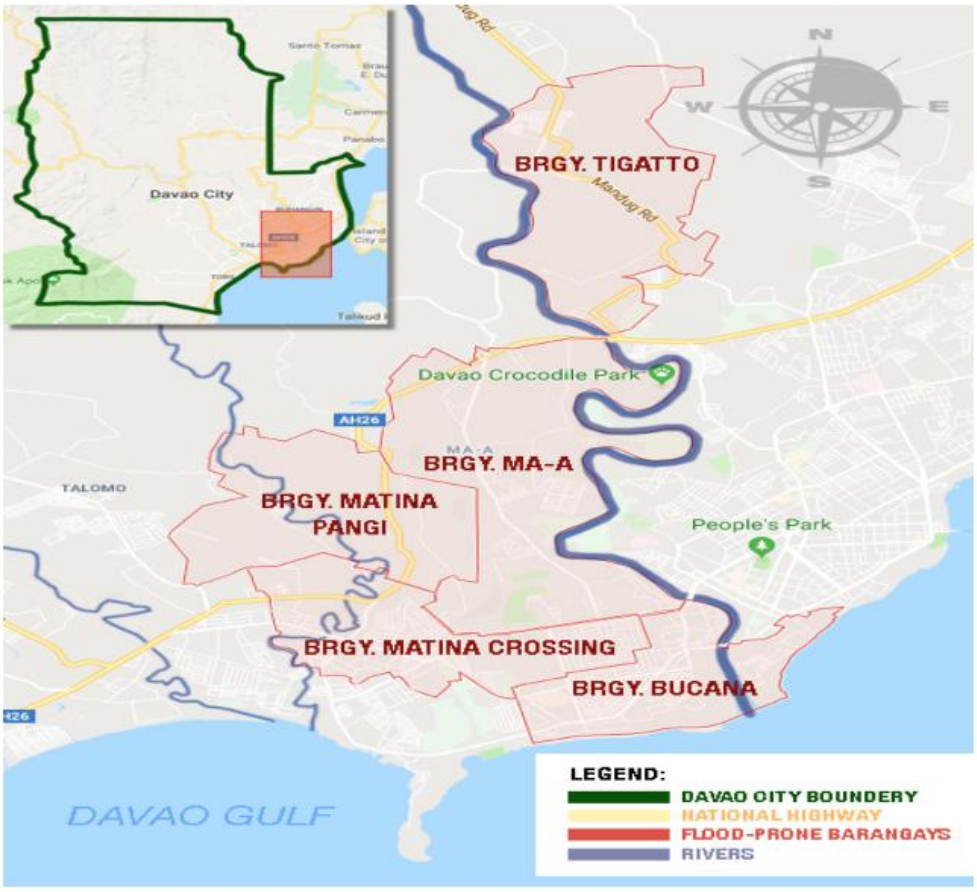
The study was analyzed using Kasperson's (1988) Social Amplification of Risk Framework (SARF) based on the concept that risk communication is usually developed by experts and hazards interact with the psychological, social, institutional and cultural processes that may amplify public responses to the risk/risk event. Thus, risk perception influences risk-related behaviors, hence, amplified risk leads to behavioral response. Similarly, gaps in risk communication leads to gaps in risk perception translated into deficiencies in disaster preparedness and adaptation strategies (Slovic, 1987; Wisner, 2012). This framework, therefore, links the technical to psychological, sociological and cultural perspectives to highlight the "gaps". Accordingly, messages or signals about risk travel from individual amplification stations to another. The manner in which these amplification stations follows the key amplification steps and uses informational mechanisms will determine the secondary and third order impacts of the risk information and the response mechanisms of individuals or groups. Kasperson, et al (1988) viewed that hazards interact with psychological, social, institutional, and cultural processes in ways that may amplify or attenuate public responses to the risk or the risk event. Amplification occurs at two stages: in the transfer of information about the risk, and in the response mechanisms of the society. The transmission of different signals in social amplification does not completely follow the traditional sender-message-receiver communication models. Social amplification deals more on the symbolic interactions although it still uses the sender-receiver model as its reference in the communication process.

Its dynamic nature, however, paves the way for more feedback and responses. Hence, this approach may encourage community-based communication signals that would formulate the appropriate approach to risk communication management at the level of the local communities.

A mixed methods research (Terell, 2012; Cameron, 2011), specifically, the exploratory approach was utilized in this research, guided by Creswell's idea that it is a better approach to employ strategies or inquiry that involve collecting data sequentially to best understand the research problem (Creswell & Clark, 2011). The qualitative phase determined the risk communication systems approach using Key Informant Interviews (KIIs), Focus Group Discussions (FGDs) and evaluation of the risk communication management at the community level. The quantitative approach using a multi-stage cluster sampling was employed in this study to determine the profile, the knowledge and information systems at the local communities as well as to find out their assessment of the barangay efforts. The survey was conducted among the top five (5) flood prone barangays identified by the Davao City Risk Reduction and Management Center with a total population of 6177. Employing a multi-stage cluster sampling and Slovin's formula, with a 95% confidence level and .05 confidence interval, a sample population of 376 household respondents was identified. Data analysis was observed to summarize the big amount of information from the survey questionnaires and translated into quantitative measures of interpretation. The following methodologies were employed : frequency, ranking, graphing and categorical regression using R statistical software and Microsoft Excel.

The data from the City Disaster Risk Reduction Management Office (CDRRMO) was utilized and from the KII, top five (5) barangays were identified by the CDRRMO as the flood-prone areas in Davao City, specifically, Matina Crossing, Matina Pangi, Ma-A, Tigatto and Bucana (see Figure 2). Furthermore, the barangays prioritized the top five zones (puroks) as highly critical to flooding. Thus, the total population considered for the sampling frame was 6177 households. Using proportional allocation, a sample of 376 was determined. The simple random sampling and randomization procedure of HH intervals helped identify the specific households as the respondents of the survey, giving each household an equal chance to be selected.

Figure 3: The geographic location of the research locale



Results and Discussions

Results of the Key Informant Interviews conducted with the Association of Barangay Captains (ABC) President, her Chief of Staff and the Barangay level Disaster-In-Charge (2017) revealed that Davao City has been compliant and very active on DRR and CC related programs. However, they admit that there is still no City Ordinance that captures the de-centralization of communication tools that will encourage the barangays to "localize" the materials as distributed by the national and the LGU levels. There are some barangays that initiated this approach, but, since it is not mandatory and due to financial and manpower restraints, majority of the barangays resort to utilizing the materials from the national level. Similarly, the lack of context-specific materials on DRR strategies has been the sentiment of the Chief of Operations and Warning Section of 911 and also verified by the Training and Research Head of the Davao City Public Safety and Security Command Center. To date, no comprehensive study has been documented on the reception of the communities which can provide feedback on the effectiveness of these strategies and materials. In addition, they also observe that there is still a lack of a standardized communication protocol that would help manage the dissemination and management of risk communication at the level of the local communities.

The conduct of the survey aims to document two areas of concern: (1) to assess the perception, attitude and behavior on flooding, and (2) to evaluate the reception level of the local communities on the barangay efforts --- both on the capacity-building and the use of the communication tools.

Survey questionnaires were formulated based on the results of the Key Informant Interviews (KIIs) from the implementers of the risk communication in Davao City, specifically, the Public Safety and Security Command Center (PSSCC); the City Disaster Risk Reduction and Management Office (CDRRMO) and the Association of Barangay Captains (ABC). As KII revealed that programs and strategies are being implemented for the community's awareness and preparedness level, this study aimed to determine the extent of these initiatives and find out the awareness and the response of the communities to these efforts. Items in the questionnaire included respondents' perception, awareness and experiences in flooding, knowledge on communication protocols and implementers' efforts, awareness and assessment of communication tools and risk messages. Data about the type of property and socio-demographic variables were also collected.

Profile of the Respondents

In the analysis of the data, re-encoding of the data from the survey questionnaires was done due to ambiguous categorizations. Some 23 data were irretrievable from the first encoder, hence, 353 was the total number of survey respondents processed and analyzed.

Table 1 shows the profile of the survey respondents based on their socio-demographic data. The age group was re-classified according to NEDA's age classification index as young with ages 0-21, middle-aged 22-45-year olds, old for ages 46-60 and senior citizens for above 60 years of age. The results revealed that majority of the respondents come from the middle-aged group. Similarly, majority of the respondents are females and in terms of educational attainment, majority are high school or secondary level. Most of the respondents are married. In terms of occupation, not all the respondents were able to classify their status of occupation, rather, majority have varied occupation from laborers, drivers, salesclerks, household help, school janitors, canteen servers, among others categorized under the item others. Due to the small number of respondents per religious affiliation, only three categories were used as Roman Catholic, Islam and Others (inclusive of all other religious affiliations). The gross HH monthly income was categorized based on the Bureau of Internal Revenue's (BIR) bracketing system for 2017. In terms of years of living in the area, majority of the respondents have been in the area from 0-20 years.

Table 1. Socio-demographic Profile of the respondents

Socio-demographic Factors	n	%
Age Group		
Young	5	1.4
Middle-aged	189	53.5
Old	141	39.9
Senior Citizen	18	5.1
Sex		
Male	68	19.3
Female	285	80.7
Educational attainment		
No Education	3	.8
Elementary	67	19.0
High School	187	53.0
College	81	22.9
Vocational	15	4.2
Civil Status		
Single	27	7.6
Married	223	63.2
Live-in	55	15.6
Widower	37	10.5
Separated	11	3.1
Occupation		
Others	175	49.6
Private	18	5.1
Government employee	12	3.4
Self-employed	90	25.5
Not employed	58	16.4

Socio-demographic Factors	n	%
Religion		
Roman Catholic	239	67.7
Islam	32	9.1
Others	82	23.2
Gross HH Monthly Income		
10,000 and below	185	52.4
Above 10,000 – 30,000	154	43.6
Above 30,000 – 70,000	8	2.3
Above 70,000 – 140,000	6	1.7
Years of residence in the Area		
0-10 years	127	36.0
Above 10 years to 20 years	115	32.6
Above 20 years to 30 years	57	16.1
Above 30 years to 40 years	28	7.9
Above 40 years to 50 years	17	4.8
Above 50 years to 60 years	9	2.5

In terms of household composition, some households have senior citizens and children below five (5) years of age. Majority of the households have at least one student and one member earning a monthly salary. Moreover, in terms of the house ownership, majority of the respondents owned their houses and almost half of the respondents used mixed materials in their house structures making it more vulnerable to flooding.

Perception, Attitude and Experiences on Flooding

In terms of the perception and attitude on flooding, majority of the respondents having been residents in the area for 0-20 years and living in a dwelling made of mixed solid and light materials, have experienced flooding on occasional events in usually more than 4 feet high. They know the fact that they are living in the flood-prone area due to their geographic location near riverbanks and/or low-lying areas. Thus, making them "immune" to the flooding incidences. Although they perceive that flooding is usually associated with rainfall, they recalled that some occurrences of flooding are not usually experienced during rainfall. The study revealed that majority of the respondents consider other factors, such as downpour in the higher areas, overflowing of Davao river, high tide incidences, garbage maintenance as the root cause of flooding in their areas. They also associate flooding as an effect of climate change; result of obstructions in the drainage system and poor urban planning.

Moreover, residents of the flood-prone areas confirm that the impact of flooding to both households and communities are damage of dwellings and disruption from work, leading to loss of income. Despite these eventualities after flooding, a big factor of the respondents having to live with the risk of flooding is their financial conditions. The study reveals that the majority of the respondents has a monthly household income of Php 10,000 and below. Hence, despite living in a flood-prone area, majority of the respondents reveal that even if they are amenable to a relocation, they cannot do so due to the cost that it would entail aside from sentimental reasons and familiarity with the area. They also consider that their current location is strategic in terms of their workplace and school for their children. Thus, they have resorted to strategies that would allow them to prepare for flooding incidences. Similarly, building disaster-resilient communities have been initiated in some areas that aimed to reduce community vulnerabilities to disasters by incorporating DRR into their community development programs. The pilot projects documented as of 2010 include: early warning system, vulnerability reduction & social protection and participatory disaster-responsive governance (Dela Cruz, Ferrer and Pagaduan). Moreover, building disaster-resilient communities to reduce vulnerability proves to be effective using the community-participatory approach. Some of the documented initial projects in the Philippines have shown that the more are the community and stakeholders, the higher is the assurance of effectiveness.

Household Responses to Flooding

In terms of preparations and behaviour, Table 2 shows the household responses to flooding. Majority of the respondents reveal that preparing for flooding is of high priority during rainy days (and that they find it necessary to be aware of the weather conditions from the national and local media --- both TV and radio, text messages from the NDRRMC and rely on the alarm for the early warning system of the barangay. During the flooding incident, they also consider family and relatives as the primary motivators for the preparations and that evacuation is necessary when advised by authorities to ensure safety of their family members. It is, however, noted that the respondents also reveal that evacuation from their households usually involve only the senior citizens and children considered to be the more vulnerable members of the household. At most times, the head of the family (father and mother) and the older male members of the household remain in their households for the security of their property and other belongings.

Table 2. HH Responses to Flooding

Timeliness of preparation	frequency	percentage
When rain falls	127	28.5
When water levels are high	90	20.2
When the news says the weather is bad	59	13.2
When the community alarm rings	19	4.3
When floodwater starts to enter the house	2	0.4
When authorities advise us to do so	31	26.5
Other reasons	118	26.5
Primary Motivators to prepare	**frequency**	**percentage**
Family and relatives	139	31.8
Personal experience	34	7.8
Knowledge of flood risks	6	1.4
Aggressive programs of barangay	117	26.8
LGU initiatives	6	2.5
Others	130	29.7

Reasons for Evacuation	frequency	percentage
Personal/past experiences	90	19.4
Safety of family	221	47.6
Advise of barangay authorities	13	2.8
Religion	1	0.2
Important things in the household	4	0.9
Advise/messages	1	0.2
Self-decision	40	8.6
Sufficient knowledge on flood risks	6	1.3
Not relevant to our experience	11	2.4
Others	77	16.6

Results of this study confirm other related studies that highlight the community's role and participation for an effective disaster mitigation, preparedness and response (Samadar, et.al., 2015; Martin, 2009; Mayhura E (ND); Villanueva, 2016).

Awareness, Attitude and Assessment of the Barangay Efforts

Among the five (5) flood-prone areas of the study, it was found that majority of the respondents are aware of the barangay efforts on awareness and dissemination of information about flooding and the sources of information. Table 3 shows the respondents' awareness of barangay efforts as well as the sources of information of risk messages on flooding. The study revealed that more than half of the respondents are aware that communication tools are being used by the barangay, they also know of the trainings, seminars and drills being conducted mostly by the barangay DRRMO. For the communication tools, they are mostly familiar with tools like posters, signages, brochures, radio communication and community meetings. Specifically, among the communication tools that they are familiar as sources of information on flooding, majority of the respondents considered TV or radio as the source of information on flooding; they are also familiar with the use of social media like text messages, FB or twitter in relaying information about flooding; while, 83% have seen brochures at the BDRRMC and 81% are aware with flyers or leaflets being distributed to the community. Some are also aware of the following sources of information on flooding considered under others: word-of-mouth and house-to-house information campaign by the zonal (purok) leaders.

Table 3. Respondents' Awareness of the Barangay Efforts on Flooding

EFFORTS	YES		NO		SOURCES of INFORMATION					
					BARANGAY DRRMO		CITY DRRMO		NATIONAL/ NDRRMC	
	n	%	n	%	n	%	n	%	n	%
TRAININGS & SEMINARS	124	35.1	92	26.1	90	25.5	3	.8	22	6.2
DRILLS	108	30.6	77	21.8	71	20.1	0	0	23	6.5
EARLY WARNING DEVICES										
House to House	68	9.3	28	7.9	70	19.8	3	.8	4	6.20
Use of Megaphone	62	17.6	27	7.6	64	18.1	1	.3	4	1.1
Use of Handheld radios	42	11.9	28	7.9	10	2.8	1	.3	1	.3
Other Efforts	42	11.9	28	7.9	23	6.5	2	.6	27	7.6
COMMUNICATION TOOLS	199	56.4	134	38.0	116	32.9	4	1.1	12	3.4

The barangay efforts on communication tools was also assessed, and majority said that they are aware of the distribution of the communication tools that relay information about preparing for disasters and risks of disasters in their area. Among the communication tools, they consider that national TV, radio and other mass media and text messages from the NDRRMC and other government agencies as the most common sources of information. Incidentally, respondents who indicated OTHERS as their choice consider word-of-mouth as one of the communication efforts being utilized by the barangay.

Table 4. Awareness and sources of communication tools and risk messages

COMMUNICATION TOOLS	AWARENESS		SOURCE OF INFORMATION			
	YES	NO	Nat'l.	City	Brgy	N.A.
Flyers/leaflets	289	64	1	1	11	340
Posters	276	77		26	1	326
Brochures (with folds)	293	60		6	2	345
Billboards/Road signages	225	128	2	4	68	279
Text messages	124	229	243	11	19	80
SMS (FB, Twitter, etc.)	310	43		7	20	326
Community mtgs/Assemblies	155	198	2		159	192
Seminars/Drills	177	176		2	126	225
Radio Communication	107	246		4	224	125
TV or Radio	74	279	26	293	19	15
Others	41	10	1	4	9	339

In the respondents' assessment of the barangay efforts, the study revealed that majority expressed very good assessments (58%). Statements on assessment have been provided for respondents to rate with an index ranging 1-5 using the following scale: 1-Very Poor, 2-Poor, 3-Average/Fair, 4-Good and 5-Very Good. Table 5 shows the summary of their ratings and assessment. However, factors like individual beliefs; personal experience on flooding and personal knowledge about disasters may become a barrier for the reception of any barangay effort or communication tools. In addition, FGD participants claim that their experiences provide them with the best preparation for any eventuality.

Table 5. Assessment of Communication Strategies Index

Assessment Rating	frequency	percentage
Very Poor	0	0
Poor	0	0
Average/Fair	30	8.5
Good	116	32.9
Very Good	207	58.6
TOTAL	353	100

With regard to the effectivity of the communication tools, majority of the respondents consider that almost all of the communication tools being used by the barangay are effective in communication information like guidelines for evacuation; information about evacuation centres, information about disasters and its related risks. This assessment is attributed to the elements of visual designs for tools like posters, flyers, signages and billboards; while accessibility for text messages and online media and understandability, relevance and reliability for face-to-face communication, specifically, during community meetings and seminars. Furthermore, TV, radio and other mass media is both understandable and available in every households. This study echoes the role of risk perception and communication as an effective mitigation and preparation for disasters (Martin, 2009; Comfort, 1999; Kasperson, 1988). Furthermore, Slovic (1987) emphasized that gaps in risk perception can be translated into deficiencies in disaster preparedness and adaptation strategies. Thus, this gap in communication can adversely affect local awareness of potential risk and the local response to a hazard like flooding. Similarly, it encourages a system-based (Reid, 2015) and multi-lateral approach (Okada & Matsuda, 2005) to empower the communities in developing their own risk communication strategies that will emphasize the multi-lateral knowledge and context-specific messages produced from the experiential learnings of the flooding incidents.

A categorical regression (CATREG) method was also employed to test whether selected predictor variables such as experiences on flooding, depth of flooding, flooding occurrences, effect of flooding to household and community, familiarity of tools as source of information as well as communication barriers may have influence on the response variables to the assessment of the flood-prone communities to the communication systems of Davao City.

Optimal scaling has been done and some variables have been excluded due to its zero or missing values as well as zero variants. Table 6 shows the importance of each variable and its role in predicting the result on the dependent variable. It indicates that the value of R square which is 27% of the variance in the transformed preference is explained by the regression on the optimally transformed predictors.

The largest to lowest coefficients revealed familiarity of tools as sources of information (β-.343, p =.000); frequency of experience with flooding (β-.135, p<.01) and effect of flooding to community (β-.111, p<.10). This means one standard deviation increase in awareness of efforts would lead to a 0.343 standard deviation decrease in assessment. For instance, since the familiarity of tools as sources of information is treated ordinally (rank), then an increase or decrease in quantification corresponds to a movement down the rankings. Similarly, the frequency of flooding that people experienced, a 1-point increase in the standard deviation would mean a 0.135 increase in the frequency and since the variable is treated ordinally, this increase would correspond to a movement up in the rankings of frequency.

Meanwhile, the zero order figures indicate the correlation between the predictors and the response (assessment scores), those with negative are the high correlations. Specifically, zero order correlations reveal that the highest correlation which translates to poor or low assessment scores are the following predictor variables: familiarity with tools as sources of information with -.465; followed by flooding effect on community with -.328; flooding effect on households with .286; depth of flooding experienced by the respondents with -.222 and flooding occurrences which is -.130. This means, that familiarity of tools as sources of information tends to influence their scores toward low assessment. The greater the impact of the flooding occurrences to the households and the communities or the more the residents suffer from flooding, the lower is their assessment of the communication systems. Moreover, the zero-order correlation between predictor variables and the assessment scores on the communication systems revealed that familiarity with communication tools as sources of information had the largest correlations and a partial correlation of -.320. Furthermore, removing the effects of other variables, translates it into a 32% variation in the assessment of communication strategies ranking.

In assessing the degree of importance of the predictor variables in explaining the response variables, the following degrees of importance can be inferred from the regression analysis: familiarity with tools as sources of information = 1; effect of flood to community = 2; depth of flooding experienced = 3; effect of flood to households = 4 and frequency of flooding = 5. This reflects that these variables explain or account to 27% of the importance for this combination of factors or predictors. This reflects the consistent results highlighting that among the predictor variables regressed, the significant predictors of the respondents' assessment scores to the communication systems are the familiarity of tools as sources of information; effect of flooding to community; depth of flooding; effect of flooding to households and occurrence of flooding which showed significant relationship.

Table 6. Categorical Regression of selected predictor variables on assessment of the communicatio systems

Predictor Variables	Estimated Coefficient	F-statistic	p-value	CORRELATIONS			
				Zero Order	Partial	Part	Importance
Frequency of flooding	.166	8.462	.000***	.051	.168	.146	.032
Depth of flooding	-.135	5.258	.006**	-.222	-.133	-.115	.113
Flood occurrences	-.020	.145	.704	-.130	-.022	-.019	.010
Effect on HH	-.084	1.786	.182	-.286	-.078	-.067	.091
Effect on community	-.111	2.962	.086*	-.328	-.100	-.086	.137
Familiarity of tools as sources of information	-.343	33.149	.000***	-.465	-.320	-.289	.601
Communication Barriers	-.050	.965	.327	.089	-.057	-.049	.017

*If significant: *Significant at p 0.10; **Significant at p 0.05; ***Significant at p 0.01.*

The flood-prone communities' reception and assessment of the risk communication systems at the barangay level reveal that the significant predictors of the respondents' assessment scores to the communication systems are the familiarity of tools as sources of information; effect of flooding on community; depth of flooding and frequency of flooding which showed significant relationship.

The respondents may have the mindset that the community-based strategies that they formulated may be working for

their self-monitoring and preservation at times of flooding incidences. Having the idea that they have been equipped with the previous experiences and they no longer see the need to rely on formal risk communication messages and resort to formulating their own responses to the disaster that they seem fit to be appropriate, results of this study showed that using the Categorical Regression test, familiarity with the tools as sources of information has the significant relationship with their assessment scores.

The premise of this study is that flood risk as a hazard to flood-prone communities interact with the psychological, social, institutional, and cultural processes in ways that may amplify or attenuate the community's responses to the risk or risk event. Amplification occurs at two stages: in the transfer of information about the risk, and in the response mechanisms of society. The amplified risk leads to behavioural responses, which, in turn, result in secondary impacts. Results of the study show that there is a significant relationship between the transfer of risk communication signals and how communities assess the efforts of the concerned agencies; however, their experiences and perception of flood risks influence these assessments.

This is in consonance to the studies on risk communication that highlights awareness and preparedness (Lindell & Perry, 2003) and the critical role of decision-making on disaster eventualities (Lindell & Perry, 2012). Specifically, flood risk communication studies have been documented highlighting the role of social networks (Haer, Botzen & Aerts, 2016), different strategies to improve flood risk communication (Haer, Botzen & Aerts, 2016; Lazrus, et.al., 2016; De Boer, Botzen & Terpstra, 2014) as well as looking at different perspectives to assess the flood risk communication systems towards upgrading awareness and preparedness (Maidl & Buchecker, 2015; Demeritt & Nobert, 2014; Rollason, et.al., 2018; Feldman, et.al., 2016).

On the other hand, Skinner and Rampersad (2014) mentioned that Nyondo in 2006 emphasized that if the process of communication is difficult in our ordinary and daily lives, it is far more so in times of disaster. The challenge remains to not only respond with accurate, understandable and complete information as quickly as possible during a disaster, but also to communicate in a proactive way that involves members of communities to reduce the potential risk of a disaster. Communication is therefore a dynamic process with a two-fold purpose that can foster learning, positive change and empowerment. It is a continuous process of coding, decoding and interpretation and a way of sharing objectives, attitudes, knowledge, information and opinions. In addition, Abarquez and Murshed in 2004 (as cited in Skinner & Rampersad, 2014) stated that when considering communication for disaster risk reduction, one should take into consideration that context plays a key role. The sociocultural context of the society, gender perspectives and scale of community (rural, small or mega) will determine how communication will be implemented. Communication planning occurs in an organizational context and is embedded in institutional cultures with specific agendas. Moreover, communication takes place in a context of risk assessment, risk intervention and risk evaluation, making it a strategy that is executed within disaster risk management. In addition, social vulnerability is key to determining the methods of communication and therefore people, complex social systems and non-structural solutions should also be analysed and considered.

This is in keeping with the general considerations in the 'priorities of action' stated in the Sendai framework (2015-2030) where there is the expected inter-operability of policies to address collaboration among agencies for disaster awareness and preparedness through aggressive risk communication strategies, the need to strengthen disaster risk governance and management and the enhancement of disaster preparedness for effective response.

Conclusion and Recommendations

The conduct of the survey of the study aims to document two areas of concern: (1) to assess the perception, attitude and behaviour on flooding, and (2) to evaluate the reception level of the local communities on the barangay efforts --- both on the capacity-building and the use of the communication tools.

Flood-prone communities' perception, attitude and behaviour on flooding revealed that significant factors such as experience in flooding, its occurrences and depth as well as years in residence influence the respondents' behaviour towards flooding incidences.

Similarly, the respondents' reception and assessment of the risk communication systems at the barangay level reveal that the significant predictors of their assessment scores to the communication systems are the familiarity of tools as sources of information; years in residence; civil status and effect of flooding on households which showed significant relationship.

Results of this study on reception and assessment of the risk communication affirms previous studies that show: (1) that different people, having different beliefs and perceptions can be bound together by experiences, in particular, flooding (Wamil, 2010); (2) there exists a link between risk perception and actual behaviours (Raude, et. al, 2005); (3) individual belief in risk reduction behaviours, effective and strongly-led people to actually engage in risk reduction behaviours (Martin, et.al., 2009; Parker, 2017; Mulilis and Duval 2006).

Incidentally, Okada, Norio and Yoko Matsuda (2005) emphasized that a multi-lateral knowledge development can be a perspective for risk communication to increase disaster preparedness at the community level. Creating a community-based disaster reduction approaches is of significance at times where local knowledge, experience, communication networks and social capital are needed to capitalize on reduction of vulnerability and ensure collective response to disasters. The effectiveness of "localized" risk communication is closely associated with internal factors that affect an individual's capacity to access and use information, with external factors related to entitlement properties of communities or individuals at risk and their ability to communicate effectively within a socio-political context. Thus, a City Ordinance to this effect will benefit a total of 182 barangays of Davao City once approved and adopted.

In so doing, there will be an opportunity for community and institutions to discuss and decide on the protocols of the inter-organization approach emphasizing the role of the institutional structures and provide the mechanisms for disaster mitigation and response that are context-specific to the communities (Tselios & Tompkins, 2017; Comfort & Kapucu, 2006; Comfort, 2008; Christoplos, et. al., 2001).

As previous studies have been documented on risk perceptions (Christopoplos, et.al., 2001; Terpstra, et.al., 2009; Martin, et.al., 2009), different risk communication strategies (Haer, Botzen & Aerts, 2016; Lazrus, et.al., 2016; De Boer, Botzen & Terpstra, 2014; Sanchez & Sumaylo, 2015; Sanchez, 2014), modelling of risk studies (Cadag & Gaillard, 2012; Bradley, McFarland & Clark, 2014; Lazrus, et.al.,2016; Lindell & Perry, 2012; Kasperson, 1988; Wisner, et.al. 2012) and evaluation of risk communication (Comfort & Kapucu, 2006; Leelawat, et.al.,2015; Mercado, 2016; Skinner & Rampersad, 2014), this particular study may provide additional literature as regards the role of community-based flood risk communication systems, particularly, in addressing the "bottom-up" approach which evidently is not yet observed by the communication systems of Davao City.

Results of this study may be utilized by the academe, specifically for local studies in Mindanao as baseline data of the flood-prone communities' risk perception, awareness and familiarity with the city government's programs and strategies and their specific attitude and behaviour on flooding. Moreover, this study can be furthered as regards to the specific communication planning for a more comprehensive awareness and preparedness concerns. Similarly, policy makers can utilize results of this study for a more context-specific governance. In particular, the crafting of a policy to empower communities to "localize" flood risk communication for awareness, preparedness and information protocols and management.

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Potentials and Pitfalls of Crowdsourcing in Disaster Risk Communication: A Systematic Review

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Abstract

Disaster Communication literature can be divided into three general categories of research traditions – structural, instrumental, and cultural. Under structural research tradition, the focus of research is organisational in nature. The instrumental tradition focuses on specific communication tools used in disaster risk information transfer. The cultural tradition focuses on engaging the local community to be proactive in disaster preparedness. Despite these siloes in literature, it is important to point early on that in reality, these traditions are not broken down into singular isolates without any overlaps and interactions.

With these disaster research traditions defined, this paper highlights the instrumental tradition as it defines and carries potential to bridge both structural (government) and cultural (community) traditions using crowdsourcing framework and the use of social media, which is a form of popular media, as case in point. This review of literature uses the scoping process to identify, limit, and analyse available literature in the instrumental tradition that focuses on crowdsourcing in disseminating disaster risk information at the disaster preparedness stage. Result of the analysis shows that crowdsourcing is effective at during and post-disaster phases as it allows a bottom-up approach in disaster information sharing. Its significance in involving the community in the process of increasing disaster resiliency by turning people as local sensors that aids first responders during disaster events. Crowdsourcing made disaster resiliency a shared activity between people and government. It also triggered to redefine preparedness stage as it differs from disaster management plans to practice. This created the WARNING Stage which bridges the preparedness and mitigation to response and recovery.

Keywords: disaster risk communication, disaster preparedness, crowdsourcing, social media, disaster management, digital technology

Introduction

Crisis informatics defined as "the interconnectedness of people, organizations, information and technology during crises" (Hagar, 2010, p.10), gave birth to two movements in communication around the world. These movements involve the (1) shift from top-down approach to bottom-up interaction and the (2) growth of socio-mobile capacities (Tan et al., 2017).

Top-down approach is defined as a kind of communication transfer characterised by different levels cascading downwards (Tan et al., 2017). This kind of approach is focused on transmission (Olsson, 2014) as opposed to a bottom-up and horizontal communication approaches described by Tan et al. (2017) as the paradigm shift in communication. Crowdsourcing, which is an example of crisis informatics, is a product of this paradigm shift. The second paradigm shift rely on the capacity of every individual to be a passive or active information source especially in the context of crowdsourcing.

Crowdsourcing, in simple terms, is the participation of a general group of people and experts in a specific field, to solve a particular problem. It is a model of disaster communication that allows group collaboration to achieve one objective – to provide a tailored information to both responders, victims and their immediate family, and the general public about a disaster (Boulos et al., 2011; Madry, 2015; Poblet, García-Cuesta, & Casanovas, 2014). Systematic literature reviews on crowdsourcing as a model of communication (Boulos et al., 2011; Madry, 2015; Poblet et al., 2014; Zhao & Zhu, 2012) has proved its relevance in all four stages of disaster risk reduction and management but is predominantly effective in "response and recovery-based efforts" (Poblet et al., 2014) during a disaster. This increase in usage of crowdsourcing model in disaster communication is backed-up by common evidence such as increase for both demand and sales of smartphones which means with more people getting access to smartphones, people will now have immediate access to blogs and social networking sites and instantly publish user-generated content 24/7. This kind of activity, also called "urban sensing", leads to the use of people as "passive sensors" through their mobile phones by virtue of carrying "sensor-laden devices" (Boulos et al., 2011). However, the number of data gathered in this manner would be voluminous and its quality is also affected by the skills and knowledge of the user, aptly called by Boulus et al. (2011) as intelligent humans, on both the medium and the subject matter. These requirements from its users can also be viewed as a limitation and because of its popularity, Zhao and Zhu (2012) labelled it as a tool that is "easy to flourish but easy to decay" as well.

Researchers on crowdsourcing as a disaster communication tool postulate that despite its potential in disaster response stage, this model maintains to be fragile as it is dependent on specific technological infrastructure including but not limited to network congestion and bandwidth (Boulos et al., 2011) and a possible communication breakdown due to the fact that disaster communication tools aim to link several number of agencies all at the same time (Tan et al., 2017) creating a more complex network. Despite these possible problems, crowdsourcing according to Zhao and Zhu (2012) can also be offline as opposed to common knowledge citing the opposite. In fact, crowdsourcing may have been a product of looking at how a small group of people coming from different backgrounds solve problems. If you introduce technology in this model, the program architecture may be complex, but its roots can be traced to solving problems by group.

Given this background, this literature review seeks to know how crowdsourcing is utilised in the pre-disaster phase (disaster preparedness stage).

Methodology

Review papers are relevant and encouraged since its purpose is to provide an overarching summary of what has been done within a particular topic (Paré, Trudel, Jaana, & Kitsiou, 2015). Out of the nine review types posited by Paré et al (2015), this paper utilised scoping technique, which aims to map the nature of studies conducted within the topic area.

Replicating the 5-step method used by Arksey and O'Malley (2005) and Tan et al. (2017), the scoping process for this paper started with identifying (1) the research question, followed by (2) identifying relevant studies. Once relevant studies were identified (3) selection of articles were made by reviewing the abstracts first to narrow the selection before reading the full article. The next steps were (4) charting of data gathered and (5) collating, summarising, and synthesising data. Scanning for relevant articles were done in EBSCO, Scopus, and Web of Science covering 2010 up to second quarter of 2018. Only peer reviewed journals were considered. (see Table 1)

Table 1: Summary of Literature Search Results

Keywords used	Scopus	ProQuest Central	Web of Science	Total
Crowdsourcing AND Disaster Preparedness	7	53	13	73
Total number of articles after removal of duplicates, non-peer-reviewed journals and those without access to full articles	5	50	6	61
Total number of articles after applying inclusion-exclusion criteria	4	10	1	15

Inclusion-Exclusion criteria include the stage of disaster management and the type of disaster. Specifically, it will answer these questions: (1) Does the paper focuses on natural disaster as defined by the EM-DAT: CRED International Disaster Database (2018)? and (2) Does the paper cover crowdsourcing as main or one of the models used for disaster risk information transfer (disaster preparedness)?

This study, however, is delimited to the methodology used by Arksey and O'Malley (2005) and Tan et al. (2017). Scopus, EBSCO, and Web of Science were the databases explored by Tan et al. (2017, p.299) to cover major publications and was thereby replicated. Exploration of other databases such as Altimetric Explorer and Google Scholar is therefore suggested.

Findings from the Literature Review

Scoping derived three general categories of literature on crowdsourcing and disaster preparedness. These are Crowdsourcing Architecture, Crowdsourcing Practices (and Examples), and Meta-Crowdsourcing.

Crowdsourcing Architecture discussed more on the development and improvement of current crowdsourcing practice and technology. Crowdsourcing Practices highlights examples of tools used during and post disaster events that utilises crowdsourcing model. This category also discusses potentials of popular applications like Twitter as a powerful tool that can be utilised for disaster management. Meta-Crowdsourcing takes a cue from the prefix meta- which means beyond. Though only a few papers were categorised under this category, these articles discussed communication frameworks and potentials and pitfalls of crowdsourcing as a model for disaster risk reduction and management.

Despite these three general trends in crowdsourcing studies, this paper does not suggest ipso facto that these are siloes without any interactions and overlaps.

Crowdsourcing Architecture

Crowdsourcing architecture category in its general sense talks about how crowdsourcing framework can be implemented and what are the various methodologies to improve the current algorithms used. Out of the five articles included in this category, one highlights the relevance of the crowdsourcing framework as a way to break away from the current top-down framework of operation of disaster risk reduction and management (Poorazizi, Hunter, & Steiniger, 2015) by using people living in the area where disaster occurred or those living within close proximity as sensors (Chu, Lin, Tsai, & Liu, 2015). This can be done by using and improving the algorithms used for volunteered geographic information (VGI) (Goodchild & Glennon, 2010; Poorazizi, Hunter, & Steiniger, 2015). Chu, Lin, Tsai, & Liu (2015) discussed the possibility of providing scores for volunteers to address the issue on participant selection. By doing so, it can help provide solution to the growing problem of data veracity. After all, it has already been proven that crowdsourcing is an effective framework during and after disaster (Chu, Lin, Tsai, & Liu, 2015).

Crowdsourcing framework is very useful specially for those who are within the area of disaster. Most often, spread of information follows a donut pattern (Goodchild & Glennon, 2010) making the surrounding areas more informed about the disaster and its impact as opposed to those who are affected by the disaster (the centre of the donut) who gets less to nothing. With crowdsourcing, affected individuals are the source of information and at the same time getting information from those within and outside their area filling the hole in that donut pattern. People on site can provide better information about their situation and this information can be relayed to on-the-ground rescuers (Kuehn, Kaschewsky, Kappeler, Spichiger, & Riedl, 2011). In this manner, crowdsourcing is seen to be complementary fashion rather than replacement of the current framework of implementing disaster risk reduction activities (Poorazizi, Hunter, & Steiniger, 2015).

In the abovementioned potentials of crowdsourcing framework, it can be observed that the development of new crowdsourcing platforms for disaster is reactive in nature. If one glitch is observed in one mobile application, other designers automatically jump into creating a new mobile application addressing that glitch. This doubles the number of platforms resulting to confusion among users. In the Philippines alone, a simple search in Google's Play Store will give you at least 10 mobile applications related to DRRM that are developed by and for the Filipinos. Some mobile application's function is only to make access to other mobile applications easier.

Moreover, problematic areas when it comes to designing and utilising crowdsourcing architecture is to come up with an algorithm that evaluates the accuracy of VGI data (Goodchild & Glennon, 2010) and its integration with spatial data infrastructure (SDI) (Manfré, Hirata, Silva, Shinohara, Giannotti, Larocca, & Quintanilla, 2012; Poorazizi, Hunter, & Steiniger, 2015) as practiced in the Ushahidi platform and some social media platforms like Twitter and Instagram. It is also observed that there is a lack of interoperability between agencies involved in disaster management (Kuehn, Kaschewsky, Kappeler, Spichiger, & Riedl, 2011) which is a requirement since disaster management requires operation of more than one agency trying to achieve one goal. Coordinated approach is deemed necessary through the use of information brokers which also allows participation of local communities in emergency communications (Kuehn, Kaschewsky, Kappeler, Spichiger, & Riedl, 2011).

Most important is that with this framework of getting and accessing disaster related information in real time, Preparedness Stage – defined in concept as building capacities of local communities to increase disaster resiliency, was changed in practice. Mitigation and preparedness, in this context, is more concerned with mapping to better improve response rate of emergency personnel of the government (Manfré et al., 2012). In crowdsourcing literature, a new disaster stage was also created and named as warning stage since disaster preparedness in practice was redefined into a few days or hours before impact. This prompted the suggestion of making the four-stage development to five which comprises mitigation – preparedness – warning – response – recovery stages.

The frontier of crowdsourcing as a model does not only provide a potential solution to a problematic top-down framework but it also addresses the problem of implementers of disaster risk and management plans being underbudget and undermanned (Goodchild & Glennon, 2010). This effort should be supported financially by improvements in its technical make-up. But most of all, crowdsourcing is data sharing and data sharing will always be political especially now that disaster response is often international in scope – Haiyan in 2013 and the Wild Boar Soccer team trapped in a cave in Chiang Rai in 2018. Political support through policies should be in place as well (Manfré, Hirata, Silva, Shinohara, Giannotti, Larocca, & Quintanilla, 2012).

Crowdsourcing Practices

Most of the literature available on crowdsourcing and disaster preparedness discusses specific platforms. Common examples would be Ushahidi and Ushahidi + especially when the concern is the improvement of its current algorithm. However, a number of available literature also discusses the potentials of social media for disaster communication.

Information you get from social media captures and reflects users' attitudes, behaviours, and reactions towards certain issues and disaster events is one of those most reacted upon and shared (Huang & Xiao, 2015). Information coming from social media can be used by emergency responders for coordination as well as measure people's sentiments towards various political and social issues. Social media has become an information rich platform and can now serve as a crowdsourcing platform, like Twitter and Sina Weibo in China as its counterpart, that has potential use in disaster management (Carley, Malik, Landwehr, Pfeffer, & Kowalchuck, 2016; Deng, Liu, Zhang, Deng, & Ma, 2016). Social media is currently used for one-way and two-way sharing of information, but it can also be used for "situational awareness, rumour control, reconnection, and decision making" (Tang, Zhang, Xu, & Vo, 2015) which are basically the communication needs during disaster events.

Dufty (2016) discussed the potential of the social networking platform – Twitter, and its use in disaster management. Through reviewing studies conducted on the platform, Dufty (2016) deduced that because of the communicative affordances of Twitter, it is best suited for disaster management as opposed to Facebook since this platform has crowdsourcing capacity, fast, and is accessible in mobile devices (Carley et al., 2016). However, an additional stage called WARNING stage in the traditional four stage disaster management was proposed by Dufty (2016) since Twitter and Sina Weibo (Deng et al., 2016; Carley et al., 2016) was seen to be an effective tool at this point. Twitter's usage during Warning stage separates but bridges mitigation and preparedness to response and recovery (Dufty, 2016). Deng et al. (2016) studied the usage of Sina Weibo before and after Typhoon Haiyan made landfall in China. Interestingly, through semantic analysis, keywords were identified to connote level of preparedness of people prior to the disaster event such as "preparing goods" which validates Dufty's (2016) proposal of creating a Warning Stage that connects the pre-disaster to during and post disaster activities.

Twitter has more functions from Warning to Response then Recovery stages of disaster management. Brouwer et al. (2017) already documented the capacity of social media data, specially Twitter, in building probabilistic maps based on reported flooded locations. This study only emphasizes that social media data can be used for disaster mitigation. Although algorithms should be refined to provide issues with regard to the reliability of pinned locations causing uncertainties in the data, it does not disqualify the fact that crowdsourcing through social media is the next big thing in disaster risk mitigation (Brouwer et al., 2017). Other studies even indicate that social media and crowdsourcing in general is an underutilized tool in disseminating disaster risk information which aids in increasing people's level of disaster preparedness and resiliency (Dufty, 2016). Carley et al. (2016) reiterates that Twitter users can be used as translators since majority of its users tweet in different languages and tweets about disaster warnings in English spreads faster than those in the local language. Although fake news and fake accounts as identified weakness of Twitter (Dufty, 2016) can be provided solution by improving the platform's algorithm and other methods suggested in studies focusing on crowdsourcing architecture, people's information seeking and sharing behaviours through crowdsourcing model should be studied first before generalising that this model (volunteered information) is the next step in the instrumental tradition of disaster research.

Because of these potentials, popular social networking sites are incorporating features that allows users to mark themselves as safe during a reported disaster event in their area. This feature extends the potential of social networking sites (SNS) to be tools for Warning Stage but these sites can also be used as tools during and post disaster events.

Another aspect of disaster management that crowdsourcing made a big impact was on volunteering and the fact that volunteerism also adapts to the ways and means of how this act is done. McLennan, Whittaker, and Handmer (2016) were inclined to think that volunteerism has two kinds – traditional volunteerism and digital volunteerism. Moreover, these two types of volunteerism encourage co-production in a community-based disaster risk reduction (CBDRR) framework saying that this framework can easily be integrated as a complimentary element to the existing framework (top-down) upheld by governments. For McLennan, Wittaker, and Handmer (2016), volunteerism in today's digital advancement took a new form from a traditional long-term type of volunteering to short-term and episodic. The beauty of this kind of volunteering is that despite being short-term and episodic, it can be habitual which means seeking for volunteers will not be a problem as foreseen. It may cause some problems though specially since digital volunteering like VGI and social media use are so spontaneous that these volunteers become middle-men in connecting not just first responders and victims but coordinating the flow of relief operations which may include financial donations (McLennan, Wittaker, and Handmer, 2016). However, potential solution to this problem is the creation of standard operating procedures for these new gatekeepers who can work within and outside the system set for volunteering. This may even lead to the development of a new framework of volunteerism aside from traditional and digital.

The problem with technologies specially using crowdsourcing as framework lies in the uptake capacity of developing countries (McCallum et al., 2016). It has been documented ex post that crowdsourcing, utilising VGI, and the use of social media for disaster risk reduction and management practices is proven useful and complementary because these are data driven technologies. However, future application ex ante of these technologies in developing countries may take longer period due to low human and technological capacity owing to social inequalities that often results to digital inequalities (McCallum et al., 2016). By this, it means that those suffering from social inequalities may have difficulty accessing digital tools due to location, poverty, and level of education among others. Despite documentation ex post that crowdsourcing, VGI, and social media can be cost-effective, developing countries does not have a stable infrastructure to have these technology anchored tools. More so, the two-way communication aspect of social media is seen to be at a superficial level only since it is limited to comments alone resulting to inadequate conversation (Tang, Zhang, Xu, & Vo, 2015).

The same social inequality was reiterated by Huang and Xiao (2015) adding to people's social media usage before engaging into the use of any social and spatiotemporal data during disaster events. This gap was highlighted after mining and classifying tweets according to specific disaster risk reduction and management stage – preparedness, emergency response, impact, and recovery.

Meta-Framework: Beyond Crowdsourcing

There is a certain level of disconnect between academics and policy makers when it comes to discussing crowdsourcing framework as posited by Klonner, Marx, Usón, Porto de Albuquerque, and Höfle (2016). In their own systematic literature review of 748 references from two scientific databases, there is a divide between user requirements and purely scientific findings. Majority of the literature gathered focused on the architecture and its improvements for use during disaster response and recovery. Their paper also pushed the importance of looking at people as they are the ones who will use the technology being discussed by this plethora of researches. Klonner et al. (2016) highlights that by looking at the users, say social media as tool for crowdsourcing, it promotes a culture of co-production and with co-production is the process of increasing risk awareness of the people living in disaster prone areas. It further enhances the shared responsibility of those who took part in the co-production process in disaster preparedness (Klonner et al., 2016).

Klonner et al. (2016) calls for studies documenting the interaction between and its environment will further improve the current technologies being proposed today. They also call for studies focusing on the application of volunteered geographic information (VGI) on disaster preparedness and mitigation.

These specific suggestions can be done following Akama, Cooper, and Mees (2016) proposed four communication frameworks in relation to Australian bushfire preparedness. According to them, communication most often follow a traditional approach and that is viewing communication as a form of transmission. This is a top-down flow of information where knowledge of experts is transferred using various programs and channels. Communication is also power. With a persistent transmission of information, attitudes may be influenced thereby affecting people's behaviour towards disasters. Given the first two frameworks, it is then appropriate to highlight that communication is a form of marketing as its intention is to influence behaviour. Therefore, "communication is never neutral or objective" (Akama, Cooper, & Mess, 2016, p.50). Lastly, communication is a community which highlights the fact that communication is two-way and is conversational. It also posits that communication creates social bonds and it turns communities into one being. The last two frameworks are proposed to be the framework when it comes to disaster communication for community preparedness. Local communities should be empowered and should be considered as experts in their own areas, so action is more innate rather than a command from an authority.

Akama et al. (2016) also agrees with Poorazizi, Hunter, & Steiniger (2015) that crowdsourcing in the form of social media should be supplementary to what is already existing since mass and social media are proven to fail especially in specific segments in the society due to social inequalities resulting to digital divides. More so, technology dependent communication tools are at risk especially when its application is only for disaster response and recovery since at this moment, communication infrastructure will be down as is in the case in Leyte, Philippines as it was struck by Super Typhoon Haiyan.

Discussion

This paper reviewed works on the potentials of crowdsourcing framework for disaster communication and it had yielded a positive direction towards utilisation of crowdsourcing in disaster response and recovery albeit pitfalls that needed improvements. With the literature reviewed, there are some points that needs to be highlighted.

First, with the developments in technology used for communication, it is foreseen that in the future, people will experience different ways and means of communicating with each other making communication not just a top-down or bottom-up approach, but a cyclical give and take phenomenon.

Second, it is important to understand people who uses crowdsourcing platforms and openly volunteer information online. Most of them are bilinguals (Carley et al., 2016) so their potential to translate messages should be tapped. As documented by Carley et al., (2016), 52 languages were used when they studied tweets in Padang, Indonesia and the three most common languages used in Indonesia are English, Indonesian, and Tagalog (Philippine language). Though only a few people tweet excessively, their tweets are often shared countless times. Therefore, utilising social media like Twitter and Facebook for disaster communication demands a face behind the message. It is therefore suggested to use opinion leaders, digital influencers, and even celebrities with huge following who can be considered as the face of a message.

Third, crowdsourcing is fast and cost-effective. Reliance on local sensors would help save cost and time for emergency agencies to respond to disaster events. However, maintaining and moderating social media accounts needs a reliable communication practitioner.

Fourth, it should be noted that volunteering is taking a facelift specially with changes in technology (McLennan, Wittaker, and Handmer, 2016). Traditional and digital volunteers are now common. This is the best time to look into these types of volunteerism and explore further its potential. It is also the right time to systematise these types of volunteerism with a clear set of standard operating procedures.

However, with these studies, certain pitfalls or aspects of crowdsourcing framework that should be addressed especially since the use of the framework should be context based.

First, there are still issues with reliability of information, but this can be improved with further studies on the architecture of crowdsourcing. Another problem related to information is the secrecy of certain organisations and even countries when it comes to sharing information with international responders. Studies on international relations in the communication context should be discussed. The Association of Southeast Asian Nations (ASEAN) started this with the creation of ASEAN Agreement on Disaster Management and Emergency Response (AADMER).

Second, crowdsourcing framework relies heavily on infrastructure. As crowdsourcing is often used during disaster to provide immediate response, it is also the stage of disaster when infrastructure is down.

Third, it is clear that this framework is understudied for its capacity to be used in the first two stages of disaster management – mitigation and preparedness. In fact, it created a new stage, warning stage, that bridges mitigation and preparedness to that of response and recovery.

Fourth, more studies should focus on people's information seeking and sharing through crowdsourcing methods. There are enough evidences as to the potentials of the framework and how to improve the framework based on this review alone. However, only a few studies focus on the users and their cultural and communication contexts. By focusing on people, the gap between structural and cultural will be answered thereby providing a more directed approach in refining crowdsourcing framework for disaster risk communication. Zhao and Zhu (2012) suggests that future studies on crowdsourcing should focus on the perspective of the end-users since crowdsourcing demands a lot from them. What is the participant's motivation to take part in this problem-solving activity? What are their behaviours when it comes to crowdsourcing technologies as well?

Future Research Direction

With these findings, this paper suggests that more explorations should be done in terms of international and national policies, security of information, infrastructure problem during disaster event, and the role and utilisation of crowdsourcing framework as the thread that weaves together disaster phases and stages.

Another track that can be explored is the technology uptake capacity of people especially in developing countries. It is undeniable that social inequalities lead to digital inequalities as well. Despite the increasing number of people having access to the internet and smartphones, the percentage of those without access is still high. It is also undeniable that the use of technology demands a certain level of education to understand its mechanism. This example of social inequality in developing countries already tells us that there could be a problem when it comes to willingness vis-à-vis ability of people to upskill themselves.

In general, the future of disaster communication is going towards multimodality – a seamless multiplatform approach on disaster risk communication. It is time to look at the function of crowdsourcing framework in this trend of disseminating disaster risk information.

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Application of Space-based Technology and ICT To Strengthen Disaster Resilience: A Case Study in the Philippines

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Abstract

Information and communication technology (ICT) and space-based technology (SBT) are emerging as important tools for strengthening disaster resilience through the collection and dissemination of reliable disaster-related data. In contrast to SBT's synoptic and repetitive data acquisition regime over large areas at a very high resolution, advances in ICT, especially the latest generation of mobile phones and their state-of-the-art applications, have made it possible for community members to collect and share local data in real-time, linking reports, photographs and other multi-media data to their respective locations. ICT is fast becoming an important tool for community-based disaster risk management (CBDRM), providing an opportunity to connect the community members and local government officials into national disaster management initiatives.

This research seeks to understand how the introduction of ICT at the local level improves: (1) the integration of communities and local governments into the national DRM framework and (2) the collection and sharing of reliable data and information related to hazards and the exposure to them to strengthen resilience and support disaster preparedness and a timely disaster response and recovery for reduction in loss of life and damage to property. It answers the call to the research community to find methodologies and tools to address communities' involvement in understanding risk using science and technology. It shows that ICT adoption into CBDRM is an effective tool for improving community integration into national DRM frameworks and assists the collection of quality data for local level preparedness and response. However, strides still need to be made in disaster risk governance to take advantage of SBT and ICT tools and community-driven data.

Keyword: Space-based technology, ICT, Disaster resilience

Introduction

No other continent witnesses more disasters than Asia. According to the International Disasters Database, in 2013, Asia experienced 158 disasters claiming the lives of 18,970 people (EM-DAT, 2018). Many of the most destructive disasters affect the ASEAN and Pacific region. Thirty percent of all disaster-related deaths in Asia in 2013 resulted from super typhoon Haiyan (local name: Yolanda), which claimed the lives of over 6,000 people in central Philippines and left millions displaced (USAID in Blanco, 2015) causing damage totalling US$12.9 billion (Ijjasz-Vasquez & Cordero, 2018).

Post-Yolanda assessments recommended that the Philippine DRM framework increase response coordination between national and local governments (Blanco, 2015; World Bank, 2017), acknowledging that the local level is where disasters occur and disaster risk reduction (DRR) capacities require strengthening (Samaddar, Yokomatsu, Dayour, Oteng-Ababio, Dzivenu, Adams, & Ishikawa 2015). Such recommendations align with the Sendai Framework's four priorities for action (UNISDR, 2015).

While it is generally acknowledged that the comprehensive laws that engage every level of government in the Philippines make it a recognized leader in disaster risk governance (IFRC & UNDP, 2014) it still struggles to address the coordination gap between the national and local governments. Resource constraints, limited capacity, high employee turnover and lack of political will at the local level prevent effective DRM activities, hindering the ability of local stakeholders to contribute to disaster risk reduction in their communities. Weak communication and coordination between the local and national governments and limited inclusion of community and local level stakeholders in DRR are recognized as a common problem globally (Weichselgartner & Pigeon, 2015; Gaillard & Mercer, 2013).

The advent of information and communication technology (ICT), particularly the proliferation of mobile phones and availability of free open-source software, is providing an opportunity to overcome many of these challenges. Information and data make up the backbone of DRR; following a disaster, this information is crucial for making decisions that lead to the reduction of loss of life and property (Tasic & Amir; 2016). ICT advances data collection, dissemination, accessibility, accuracy, standardization and timeliness for a multitude of actors like community members and all-levels of government. In the Philippines, Project Noah, a platform hosted by the University of the Philippines, provides a nationwide operational assessment of hazards and offers training for its online platform, and the Philippine news website Rappler hosts Project Argos, a collaborative online platform which allows citizens to upload location-based reports with photos using their mobile phones. However, the adoption of this technology and its subsequent information into the national DRM framework is sporadic and piecemeal.

In addition to ICT, organizations are taking advantage of space-based technology (SBT) for disaster response. Initiatives like Sentinel Asia and the International Disaster Charter offer free observation imagery during disasters, mainly to national governments, which provide synoptic views for rapid damage assessments and decision making. The Humanitarian OpenStreetMap Team (HOT) is a widely recognized collaboration of volunteers who contribute mapping efforts for emergency response using emergency observation imagery. During Typhoon Haiyan, HOT mobilized the international community to perform crowd-sourced remote damage assessments. A post-assessment report of this mapping by the American Red Cross and REACH showed that buildings mapped as 'destroyed' were over-represented by 134%, while those mapped as 'major damage' and 'partial damage' were under-represented. The assessment concluded that the creation of better base-maps and the development of a mobile application for field assessments would greatly improve the accuracy of crowd-sourced mapping (ARC & REACH, 2014). These results highlight the necessity to reduce the gap between bottom-up and top-down data flows and coordination. By linking ground-truth data with imagery for damage assessment validation, data trust is promoted and better data-driven decisions for response are possible, further demonstrating the importance of pre-disaster data.

However, without the explicit and mandated integration of data collection, dissemination and data-driven decision making into the national DRM framework, the efforts of such an undertaking are severely reduced. The accessibility of ICT means that data can be collected by a multitude of actors like community members and all levels of government. This creates a plethora of data, collected at a variety of levels (i.e. household, regional and national levels) containing information in many different data formats (e.g. PDF, Excel, and shapefile) which results in limited data operability, requiring time and resources for its usability, as seen during the Yolanda recovery efforts (World Bank, 2017). A data collection protocol mandated by the government would reduce this complication and ensure that ICT and the subsequent data are generated to be interoperable within government agencies.

However, the ability for ICT to improve data collection or the free availability of emergency observation imagery is not itself the panacea for community integration in DRM frameworks or for improving coordination between local and national government actors for better data-driven decision making. DRM operates in the background of political landscapes, where information and data sharing are at play with power dynamics (Weichselgartner & Pigeon, 2015). Therefore, the challenges in reducing coordination gaps between local and national actors are also hindered by these dynamic social factors (Donovan, 2017). Another issue affecting the utilization of data is trust. Gultom (2016) reminds us that when a community does not trust the actors who are providing the information it is unlikely to use the data to make decisions. For these reasons it is paramount to look holistically at both technical and social challenges to reduce the gap in government co-ordination and utilization for the integration of both bottom-up CBDRM data and top-down SBT imagery into DRM frameworks allowing for a powerful data assemblage to reduce loss of life and property and strengthen resilience to disasters.

Using a case study in the Philippines, we seek to understand how the introduction of ICT at the local level improves the incorporation of community and local governments to share reliable data and information related to hazards and exposure to them to strengthen their disaster resilience and support disaster preparedness and a timely post-disaster response, recovery, and reconstruction for reduction in loss of life and damage to property. It examines how increasing data reliability allows for the integration of local governments and communities into the national DRM framework.

Method

The incorporation of SBT and ICT into the Philippine national disaster management framework includes four major steps: 1) community-based OSM basemap development; 2) community-based hazard/risk and evacuation mapping; 3) crisis mapping; and 4) development of a national framework for implementing SBT in two pilot municipalities.

Two municipalities, namely Padre Burgos and Santa Josefa, were selected for the study. Padre Burgos has a population of 22,460 and is a coastal municipality located in Quezon province. Santa Josefa, has a population of 26,729 and is an inland municipality located in Mindanao in the province of Agusan Del Sur (Census of Population, 2015). Both areas are remote and highly exposed to typhoons and floods; Padre Burgos is also exposed to storm surges due to the flat topography. In each pilot municipality, two barangays were selected, Baragays Rizal and Walay in Padre Burgos and Barangays Sayon and Awao in Santa Josefa. All barangays were recipients of the Kalahi-CIDDS participatory GIS program, implemented by the Department of Social Welfare and Development (DSWD), and with dedicated DSWD staff.

Community-based OSM Basemap Development

The first step was to select members of the community and local government to map buildings, roads, waterbodies, power networks, and other critical infrastructures in OpenStreetMap (OSM) and add attributes to these features through field surveys using a mobile application (GeoMapTool). This activity culminated with community-based OSM base maps. The general workflow for developing these maps is: (i) identify the area and select community members and local government officers to participate in OSM desktop mapping; (ii) participants register for an OSM account and attend OSM training; (iii) perform OSM mapping; (iv) download the mobile application GeoMapTool to the provided smartphones and train on the usage of the tool; (v) participants go to the field, enable smartphone GPS and use GeoMapTool to add attributes to buildings, roads and other features in an offline environment. The attribute selection appears as a simple drop-down list on GeoMapTool and varies depending on the feature selected; the attribute selection lists follow the naming convention of OSM. Once the participants have finished collecting building and other feature attributes, (vi) OSM data is uploaded to a server and synchronized with the Global OSM Server using the internet connection on the mobile phone.

Community-based Hazard/risk & Evacuation Mapping

The community-based disaster-risk management (CBDRM) methodology developed by the Asian Disaster Reduction Center (ADRC), referred to as town watching, was adopted in this project and modified to incorporate ICT to create community-based hazard/risk maps and identify evacuation routes. The geoBingAn app and geoBingAn web are the two main ICT tools (mobile applications) developed for this project to support the town watching activities. Figure 1 illustrates the overview of the community-based hazard/risk and evacuation planning process.

Figure 1: Activity flow of the community- based hazard/risk and evacuation mapping

Town Watching

The process starts by selecting a group comprising a community leader, a DRM expert and a few members who have been trained on the ICT tool geoBingAn app. The DRM expert is responsible for explaining how to assess the strength (advantage) and weakness (disadvantage) of the surroundings and infrastructure for different types of hazards. Using the community-based OSM base maps, the DRM expert guides community members as they walk around the community recording information on features that will either be advantageous or disadvantageous during a disaster by taking a geotagged photo of an observed feature (building, house, school, road, bridge, etc.) and recording its information using the mobile application. Groups focus on evacuation and shelter information and past disaster events.

Hazard/risk Mapping and Evacuation Planning

Adaptions were made to traditional hazard map preparations for the inclusion of the ICT technology. Where normally this is a paper-based mapping process, geoBingAn web, a web-based platform, was used instead which provided an opportunity to share community-based hazard/risk and evacuation route maps among all DRM stakeholders for effective CBDRM. Community-based hazard and evacuation route maps are created by overlaying the town watching data with the community-based OSM base maps on geoBingAn web. Here, community perceptions about hazards and vulnerabilities are visible. Local stakeholders then identify vulnerable elements-at-risk and safe evacuation routes by digitizing hazard areas and adding relevant attributes to features. Once all the information is recorded, map(s) are produced that include scale, title, legend and orientation.

Sharing, Dissemination and Usage

Once the maps are created and approved by local governments they can be accessed securely through geoBingAn web by all levels of government. In addition, geoBingAn web allows users to access and download datasets created in the previous steps in addition to the maps. It is suggested that at the community level hazard/risk maps be printed in large format and displayed at local community centres and public locations. The maps and their features, especially those pertaining to evacuation routes are explained to ensure the community has full understanding. The maps should be circulated within local government offices and feature in identified hazard risk areas noted and used to prioritize risk reduction strategies. Many local governments are required to have their own DRM plan, and these maps can help the government amend, refine and/or develop their planning through the visual display of the disaster risks.

Crisis Mapping

During the last few years, “crisis mapping” has emerged as a real-time and public access information sharing mechanism to visualize and report various disasters. Crisis mapping for this project seeks to test both ICT’s ability for situational reporting and real-time information sharing for evidence-based and effective decision-making as well as the DRM stakeholder’s roles and responsibility. This activity is premised on a mock disaster scenario, or a crisis situation, which reflects a likely disaster scenario. During the mock drill the geoBingAn app is used by local field staff to record short messages and geotag photographs and reports. In an online environment, these data can be sent to geoBingAn web to be viewed by decision makers and local and national governments. In an offline environment, local WIFI, Bluetooth or USB transfer is needed to upload the data to geoBingAn web. In return, designated local and national stakeholders can view the geo-referenced data and send tasks and commands to field staff through the web platform to the mobile application. The geoBingAn app and geoBingAn web work together in a two-way communication flow to continually update, track, send and receive situational reports and tasks.

Development of a national framework for implementing SBT

To strengthen the role of SBT in disaster response and improve coordination between technical national agencies and international initiatives that offer free emergency observation imagery, such as Sentinel Asia (SA) and The International Disaster Charter (IDC), national DRM agencies need a protocol and framework. As the Philippines currently does not have an integrated framework for emergency observation acquisition, a national level workshop was held to bring national stakeholders and government agencies together to discuss and draft a protocol that integrates SBT and value-added products such as rapid damage assessment maps into the current Philippine DRM framework.

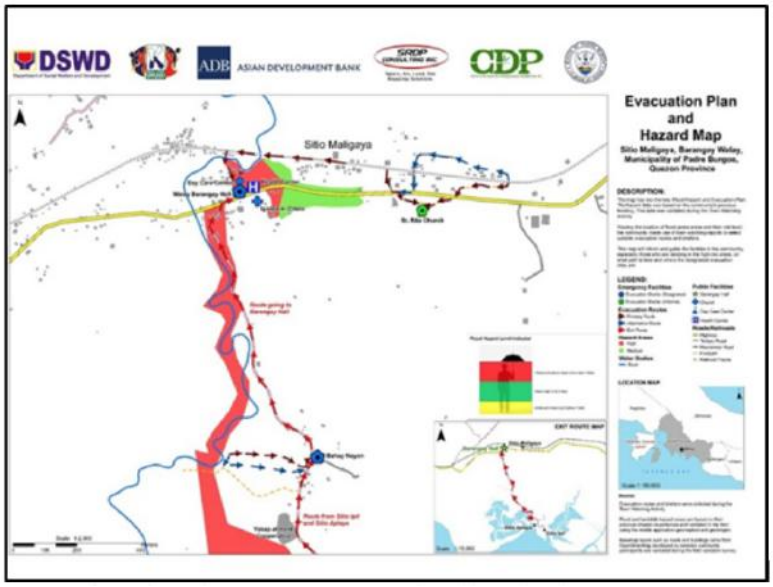
Results

Community-based OSM base-map development was hindered by the lack of high resolution imagery in OSM. Therefore, high resolution imagery (0.5m) from the Pleiades satellite was procured for the entire administrative area of Santa Josefa (350 km²) and Padre Burgos (200 km²) and added to OSM as a custom layer. Community mapping and training occurred from September 12-16, 2016 in Padre Burgos and from September 19-23, 2016 in Santa Josefa.

In October, with the cooperation of OSM Philippines, a mapathon was organized in Manila to further map the buildings in Santa Josefa and Padre Burgos. The event was open to all interested parties from both the private and public sectors. According to OSM analytics, 5,000 buildings were mapped from January 2016-July 2017 in the pilot locations. Field validation first took place in the Padre Burgos pilot barangays from December 4-7, 2016 and in Padre Burgos from December 8-12; over 1,000 buildings were surveyed. Following the DSWD's guidelines on CBDRM, the barangay disaster risk management and contingency plans for the pilot barangays were considered to include: (i) hazard and resource map, (ii) disaster timeline, (iii) elements-at-risk, (iv) social Venn diagram, (v) key facilities matrix, (vi) evacuation route matrix, (vii) hazard assessment matrix, (viii) evacuation route mapping, and ix) transect walk to create a community risk assessment (CRA). Therefore, additional activities and training were conducted in Padre Burgos and Santa Josefa and the geoBingAn app and web were modified to be adapted for the barangay disaster risk management plan and contingency plan creation. A novel approach taken by the Philippine team was to work with community members in this modification process. For example, the consensus for the parameters for town watching was driven by the community to reflect local cultural surrounds.

Town watching was conducted simultaneously in both barangays. The mappers, who were participants in OSM base mapping, were responsible for capturing the data using the geoBingAn app. The groups focused on high-risk areas in the communities. Participants found it easy to use the geoBingAn app to collect the data once they had attended the training. Hazard/risk mapping and evacuation planning were implemented independently by each barangay following town watching. Local stakeholders gathered together to upload the town watching data from the geoBingAn app and view the data on geoBingAn web. Stakeholders digitized hazard areas and confirmed the location of public facilities, evacuation routes and evacuation shelters and when necessary added further attributes to these features via geoBingAn web. Afterwards, the participants exported their evacuation routes, shelter points and hazard areas into geoJOSM and Excel file format. While geoBingAn web has the functionality to produce maps, the Philippine country team chose to use GIS to publish the maps. The maps formed part of the barangay disaster risk management plan to be used as a planning instrument at the local level. Additionally, these maps will help the local governments access the Local Disaster Risk Reduction and Management Fund, which provides national government funding to local governments, of which 70% can be used to support pre-disaster preparedness and risk reduction measures. Figure 2 shows the Walay Barangay community-based hazard and evacuation map.

Figure 2: shows the Walay Barangay community-based hazard and evacuation map.



The crisis mapping scenarios for conducting mock drills were adopted from the CBDRM contingency plan, which consists of: (i) the barangay DRRM structure; (ii) roles and responsibilities; (iii) scenario; (iv) early warning system; (v) communication protocol; and vi) inventory of response needs and capacities during emergency response.

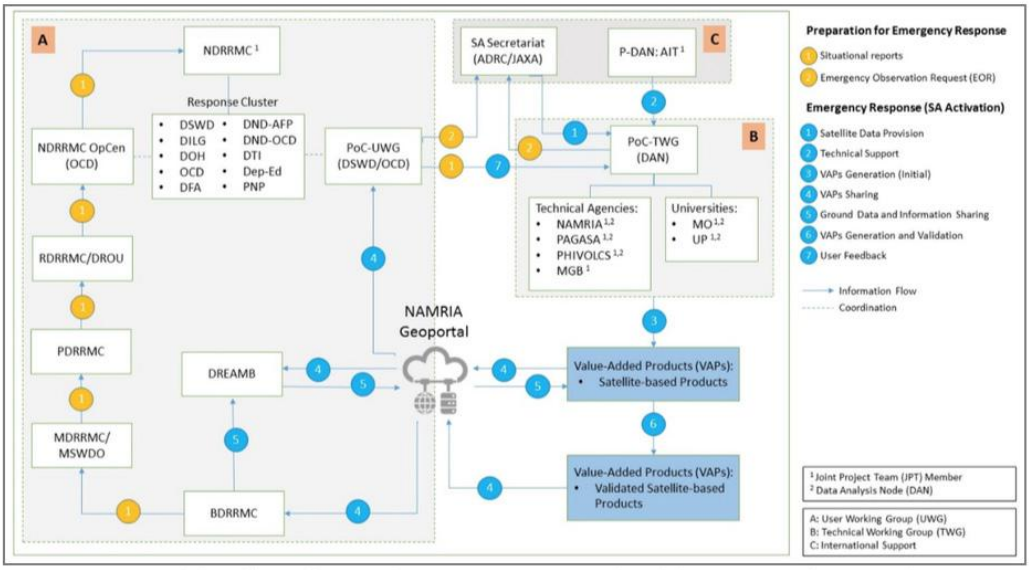
In Padre Burgos the drill reflected a typhoon and storm surge scenario and in Santa Josefa a flood scenario. Both drills involved the local governments (barangay and municipal), barangay DRM committees, and included the involvement of the Philippine National Police, Bureau of Fire Protection and Department of Education. Using the hazard and evacuation maps, the mock evacuations were carried out following the evacuation routes to the evacuation shelters. The geoBingAn web was used to send the Philippine Atmospheric, Geophysical and Astronomical Services Administration-issued early warning information to DRM field staff who received an alert on their smartphones through the geoBingAn app. Once the evacuation began, local stakeholders used the geoBingAnaApp to send situational reports from the field to the local emergency operation centre, who then sent tasks to be performed by the field staff. In Padre Burgos, 16 households were evacuated, a mock rescue of stranded fishermen at sea was also carried out as well as the clearing of a road blocked by debris. These 'injects' into the drill tested the local stakeholders' knowledge of their roles and responsibilities and the mobile application's performance. The scenario lasted for 3 hours and included the distribution of food and relief supplies. Field staff reported that it was easy to use the geoBingAn app for reporting and managing tasks. The contingency plan in combination with the drill allowed the local governments to test their roles and responsibilities.

A trainer-trainee ratio of 1:10 was maintained for conducting the training, and 10 days of training was organized at the community level to introduce ICT and perform required mapping activities for the CBDRM process. It was observed that the younger community members were more likely to use the mobile phones directly, but this did not exclude those hesitant in using technology as the mobile and web-platform applications allowed the narratives and information from the whole of the community to be captured. For example, a community member could guide younger mappers to capture hazard information with the mobile application.

To implement the tools developed for strengthening disaster resilience requires a reliable communication infrastructure, access to ICT, and local and national level DRM policies that mandate interagency data sharing through protocols and standards to allow for a two-way information data flow. Based on assessments of Philippines DRM and ICT related policies and laws in force, and feedback received from the government agencies and the relevant stakeholders, the following policy recommendations were suggested: 1) the Philippine Disaster Risk Reduction and Management structure needs improved inter-agency coordination of data flows between the four main bodies that are responsible for DRM which are the Department of Science and Technology (DOST) for prevention and mitigation; the Department of the Interior and Local Government (DILG) for preparedness; the Department of Social Welfare and Development (DSWD) for response; and the National Economic and Development Authority (NEDA) for recovery and rehabilitation; and 2) the co-ordination should be by the National Disaster Risk Reduction and Management Council (NDRRMC).

During a national level workshop, held on July 5, 2017, representatives from the Philippine Institute of Volcanology and Seismology (PHIVOLCS), the National Mapping and Resource Information Authority (NAMRIA), the Mines and Geosciences Bureau (MGB), the DSWD, the Manila Observatory, the DOST-Philippine Council for Industry, Energy and Emerging Technology Research and Development (DOST-PCIERD) and the DILG discussed and drafted an interagency protocol for emergency observation imagery acquisition and data sharing. Figure 3 illustrates the proposed data flow of ICT and SBT that is integrated into the Philippine DRM framework and identifies (i) user groups; (ii) technical working groups; and (iii) international support.

Figure 3 **Proposed data flow of ICT and SBT integration into the Philippine DRM framework**



In addition, these agencies need to develop standard protocols for vertical data flows that take advantage of community-driven DRM data, such as base-maps and hazard maps and situational reports from the field during disasters. National DRM agencies need to align data collection standards for rapid damage assessment and provide training for regional and local governments on data collection. When data standardization is achieved, then data received from the field will become interoperable within the national government DRM framework. To take advantage of SBT, specifically emergency observation imagery, community-driven data collection should include spatial attributes which, coupled with SBT data products, strengthen trust and validation of all data leading to better data-driven decision making. Technical national government agencies (e.g., DOST) should better exploit Sentinel Asia (SA) and the International Disaster Charter (IDC) to access free emergency observation imagery during disasters and use regional partners' value-added products such as rapid-damage assessment maps. More training of these initiatives should be sought by such agencies.

Conclusion

The ICT was easily adopted into the pilot barangay CBDRM framework to create community-based OSM base maps and hazard and evacuation maps. Community members and local stakeholders found it easy to use the geoMapTool and geoBingAn applications, and the geoBingAn web allowed easy accessibility to view and manipulate data to create hazard and evacuation maps. However, ICT is not itself the panacea for community involvement in the national DRM framework. Community members require capacitation to use mobile applications to increase their disaster resilience, albeit it was shown that ICT reduced the capacity gap to participate in the DRM process in the pilot areas. Furthermore, there were no clear guidelines or protocols, outside the barangay disaster risk management and contingency plan, to share DRM data created by community members with national government DRM agencies. The pilot study shows that ICT can be effective in reducing gaps between national and local level governments, but large strides need to be made at the policy level to mandate integration of ICT derived data, especially to improve data flows from the local level to the national government. Meanwhile, if national DRM agencies can better exploit SBT for the use of rapid damage assessment and integrate CBDRM data, loss of life and property would be greatly reduced.

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Establishing an Inclusive and Collaborative Approach in Creating Local Regulations for Climate and Disaster Resilience in Indonesia – A Case Study

Ari Mochamad and Suryani Amin

USAID's Climate Change Adaptation & Resilience Project (APIK)

Abstract

This paper elaborates a case study on the application of inclusive and collaborative approaches in the formulation of local regulations to build resilience to the impacts of climate change and disasters. Regulation is seen as an instrument needed to ensure the availability of a legal framework that supports efforts to build climate and disasters resilience become mandatory in the regional planning system and have clear direction. In addition, regulation provides open access to sustainable resources needed for disaster risk reduction and climate resilience. The intended access includes funding and mobilization of human resources.

The paper case is USAID's support for Climate Change Adaptation Program (APIK). Especially in the approach implemented in 2 provinces in Indonesia, namely Maluku and Southeast Sulawesi. Regulatory products produced by local governments are limited to regulatory products at the provincial level in the form of Regional Regulations on Climate Change Adaptation and Climate Change Adaptation Roadmap. APIK acts as a catalyst to encourage demand in producing these regulations.

From the practices implemented in the two provinces, collaborative and inclusive process building initiatives were presented together with the opportunities and challenges. In terms of legislative mechanisms and procedures, there are opportunities through the consultation process required for the preparation of regulations. But the challenge arises mainly from the rapid need to produce the regulation. In addition, perceptions of collaboration and social inclusion only target mainstream groups such as the private sector and CSOs. The expected form of involvement often positions the group as parties who work outside the resilience system, so that the internalization of climate resilience and disasters does not occur by these parties.

Whereas in fact social inclusion encompasses a variety of different social groups in terms of socio-economic, geography, culture, health including physical and mental disabilities, religion and others, which are classified as disadvantaged groups in situations of climate change and disasters. Meanwhile, collaboration states that are inclusive and politically equivalent. Both approaches should work together in the process of producing regulation toward resilience.

Introduction

Theoretical and Conceptual Framework

There are two main variables examined in the process of issuing regulations to build climate and disaster resilience. The first variable is social inclusion and the second variable is collaboration. In this paper both of these variables are placed in the context of drafting regulations through the legislative process to produce policies that are in line with efforts to build regional resilience to the impacts of climate change and disasters.

The notion of social inclusion can be dated back at least to the nineteenth century sociologist Weber for the importance of social cohesion. In terms of more recent history, the term is more readily identified through its counterpart, social exclusion. Social inclusion can pertain to a variety of areas of social groupings (Gidley, J, Hampson, G, Wheeler, L and Bereded-Samuel, E 2010, 'Social inclusion: Context, theory and practice', The Australasian Journal of University-Community Engagement, vol. 5, no. 1, pp. 6-36). These include demographic differentiation with respect to socio-economic status; culture and primary language, including indigenous groups, religion; geography, including those in regional, rural and/or remote areas; gender and sexual orientation; age, including youth and senior groups; health, including physical and mental disabilities; unemployment; homelessness; and incarceration.

Similar opinion regarding to social inclusion, defined as the process of improving the terms for individuals and groups to take part in society, and the process of improving the ability, opportunity, and dignity of those disadvantaged on the basis of their identity to take part in society (World Bank).

Social inclusion can be understood as pertaining to a nested schema regarding degrees of inclusion. The narrowest interpretation pertains to the neoliberal notion of social inclusion as access; a broader interpretation regards the social justice idea of social inclusion as participation; whilst the widest interpretation involves the human potential lens of social inclusion as empowerment (Gidley, J, Hampson, G, Wheeler, L and Bereded-Samuel, E 2010, 'Social inclusion: Context, theory and practice', The Australasian Journal of University-Community Engagement, vol. 5, no. 1, pp. 6-36).

Sendai frameworks for disaster risk reduction 2015-2015 recognize the importance of such approach. To cite the preamble *"…There has to be a broader and a more people-centred preventive approach to disaster risk. Disaster risk reduction practices need to be multi-hazard and multi-sectoral based, inclusive and accessible in order to be efficient and effective. While recognizing their leading, regulatory and coordination role, Governments should engage with relevant stakeholders, including women, children and youth, persons with disabilities, poor people, migrants, indigenous peoples, volunteers, the community of practitioners and older persons in the design and implementation of policies, plans and standards. There is a need for the public and private sectors and civil society organizations, as well as academia and scientific and research institutions, to work more closely together and to create opportunities for collaboration, and for businesses to integrate disaster risk into their management practices."*

In this paper, social groups are limited to those who have the potential to experience disadvantaged situations if their interests are not considered in the regulation of climate and disaster resilience. The ideology used is human potential which has closeness with the aim of building climate and disaster resilience. In the perspective of the human potential, different social groups are seen as having potential and engaging in the goal of achieving the goals for social transformation.

Meanwhile, collaborative terminology is conceptually often equated with cooperation. Both become ambiguous when other terms are included such as networking, communication and coordination (Denise, 1999; Grosz, 1996; Himmelman, 2001; Pollard, 2005). Although each of these concepts is an important component in collaboration, it does not embody values that are equal or equivalent.

The collaborative term in this paper is defined as collaboration with other parties outside the provincial government in various forms. In collaboration, the parties have an equal position and mutual interest.

This paper elaborates: 1) how social inclusion and collaborative approaches are relevant to building climate and disaster resilience 2) forms of social inclusion and collaborative initiatives both in terms of the process and substance of the drafting of regional regulations related to climate change adaptation; 3) Gaps in terms of knowledge, perceptions and practices in the application of inclusive and collaborative approaches in the preparation of regional regulations.

Overview

Project Overview

USAID's five year "Adaptasi Perubahan Iklim dan Ketangguhan" (APIK) project supports the Government of Indonesia to strengthen climate and disaster resilience, working in an integrated manner from the national level down to the regional and community levels. In support of this overall objective, APIK seeks to mainstream climate change adaptation and disaster risk reduction into national and sub-national governance frameworks; build the capacity of local communities and the private sector to address climate change and weather-related natural hazards; and support the use of information for climate and disaster risk management among key stakeholders. At the national level, APIK provides technical assistance to national level ministries to strengthen their understanding of climate change and the impact of weather-related natural disasters, and to mainstream tools and approaches that facilitate the systematic consideration of Climate Change Adaptation (CCA) and Disaster Risk Reduction (DRR) in their core planning, budgeting, and operations.

At the subnational level, APIK seeks to build the capacity of local governments to address CCA & DRR through their planning and operations, communicate about climate change, and institutionalize resilience building practices in day-to-day activities. Further, the Project works directly with communities on the front lines of climate change and disaster resilience in the target districts to implement measures and link those measures to the relevant government processes in a holistic systems approach.

The policy products in the form of Climate Change Adaptation Regulations that are being drafted in the Province of Southeast Sulawesi and the Roadmap to Climate Change Adaptation in Maluku Province which is the focus of this paper are efforts to integrate CCA-DRR in regional development planning. The CCA-DRR regulation was prepared by the Southeast Sulawesi Provincial Government, while the Climate Change Adaptation Roadmap was prepared by the Maluku Provincial Government together with the Directorate General of Climate Change Control at the Ministry of Environment and Forestry at the national level. Content of the regulation mainly cover issues, priorities, targets, strategy & programs and resources management toward disaster and climate resilience

Profile of Climate & Disaster Vulnerability

Southeast Sulawesi Province is an area with high levels of hydro-meteorological threat. Southeast Sulawesi Province is geographically, hydrological and climatologically potentially exposed to threats caused by climate change. The direct impact is floods and landslides, while the indirect impacts is disturbances to livelihoods, damage to infrastructure and coastal ecosystems due to sea level rise. Most of the population depend on their livelihood resources for the management of natural resources from the agriculture and fisheries sector.

Agriculture in Southeast Sulawesi is dominated by rice and horticulture. The impact of climate change on this field is the decline in agricultural production to crop failure caused by increased air temperature, extreme rainfall and drought, as well as changes in seasonal patterns and strong winds that can damage crops. Southeast Sulawesi in 2015 was able to produce at least 646,208 tons of rice (paddy rice) with a harvested area of 135,003 Ha.

Southeast Sulawesi Province is one of the provinces with a large amount of fish production. Recorded in 2016 the number of marine fisheries production in this province reached 151,680 ton. The impact of climate change on this field, especially capture fisheries, is the decline in fish production caused by fish due to rising sea temperatures, changes in seasonal patterns, and damage to fishing gear such as fishing boats due to strong winds. These things make it difficult for fishermen to catch fish and make fishing production costs increase.

The threat of climate change that can affect this field is an increase in air temperature and changes in seasonal patterns that can lead to changes in biodiversity to reduce forestry production. Dryness can cause a decrease in biomass and an increased risk of fire. Conversely, extreme rainfall can also cause certain trees to fail to flower and of course reduce their productivity.

Number of poor people in the province in 2015 has increased compared to previous year, from 314,9 thousand of people (12,77% of the total population) to 345,02 thousand of people (13,74 % of the total population).

Figure 1. Statistics of the Provinces

Southeast Sulawesi	Maluku
Total area of 148,140 km2, covering land area of 38,140 km2 and sea area of 110,000 km2. Coastline length 1,740 km, number of islands 651 2016, population in 2016 totaled 2,499,540 people consisting of 1,256,056 inhabitants.	Maluku Province is an archipelago of 1,340 islands with coastline length of 10,630 km total area of 712,479.69 km2 where the sea area is 92.4% and the land area is only 7.6%. The total population of Maluku Province in 2016 was 1,715,548

Maluku Province as an archipelago with a land area of only 7.6 percent compared to the oceans. Therefore, climate change has a unique impact on this island region. Climate change provides exposure to its derivatives, namely the rise of temperature, drought, extreme rain, seasonal changes, sea level rise, and strong winds.

In Maluku, the capture fisheries sector is particularly vulnerable to extreme weather changes. One of the impacts of global climate change on the capture fisheries is the occurrence of the El Nino phenomenon (rising temperature of the Pacific Ocean) and La Nina (the decline in Pacific Ocean temperature) that affects oceans around the world.

In addition, climate change also impacts the availability of clean water. The existing water source comes from springs, wells and deep wells. If this is not well managed, then within several years the community will be threatened by drought. When El Nino attacked in 2016, the people of Ambon- the capital city of Maluku suffered from water shortage that the local disaster management agency (BPBD) had to distribute water to the people in drought-stricken areas.

Climate change is one of the most serious threats to agriculture in Maluku and it has the potential to cause new problems for the sustainability of food production and production systems in the present and future. The effect of the climate change on the agriculture sector is multi-dimensional, from resources, infrastructures, and systems to the aspects of food security and independence that affect the welfare of farmers and the community in general. The changes in rainfall patterns and extreme climatic events in recent years in Maluku province pose a real threat to agriculture.

Extreme weather disrupts also the shipping system in Maluku Province especially in the period of December-January-February-March when the average wave height reaches 2.5 meters. The extreme weather threatens the displacement of 109,964 people annually and also disrupts inter-island logistics distribution.

Social Inclusion & Collaborative Initiatives in Climate Change Adaptation Local Regulation Making

Legal Framework

In the rule of law in Indonesia, the drafting of Regional Regulations follows Law No. 12 of 2011 concerning the establishment of Legislation. According to the Act, the stages of the drafting of the Regional Regulation begin with: 1) Planning through the Regional Legislation Program, 2) Compilation, 3) Discussion and Formalizing, 4) Enactment.

Planning a Regional Regulation can be done if the subject is included in the list of Regional Legislation Programs. The program contains a list of priority product legislation planning. In the preparation of the regional legislation program, the law requires that the basis used is one of the aspirations of the local community. Apart from that, the regional legislation program is also based on higher law orders, regional development plans and the implementation of regional autonomy and co-administration tasks.

The next stage in the drafting of regional regulations is the joint work between the legislature and the executive and their respective work tools. In Article 96 of Law 12/2011, regulating the participation of the community in the formation of legislation states that:

1) The public has the right to provide input verbally and / or in writing in the formation of laws and regulations

2) Input verbally and / or in writing as intended in paragraph (1) can be done through: a. Public hearings, work visits, c) socialization and / or, d) seminars, workshops and / or discussions

3) The community as referred to in paragraph (1) is an individual or group of people who have an interest in the substance of the Laws and Regulations.

4) To facilitate the public in providing input verbally and / or in writing as referred to in paragraph (1) each Legislation Plan must be easily accessible by the public.

Participation is an approach used to ensure that Regional Regulations generated from aspect of process consider the interests of the community. So that its existence contributes to social change and empowers people. In the context of climate change adaptation and disaster risk reduction, local regulations prepared by including the community in its process will be beneficial to find out how climate change and disasters impact specifically on various groups.

In line with the law, the national government regulation 45/2017 concerning community participation in local governance stipulating also obligation for the government to ensure community participation in local regulation making, in particular for regulation that potential to bring social impact on the community. According to the regulation, the local government should provide support to build capacity of community groups to effectively participate. The channel for public participation including public consultation, public hearing, working visit and workshop/seminar/discussion.

The government have the obligation to inform community on the draft of the regulation through mass media that is accessible and to develop an online-based information system.

Social inclusion is actually an advanced spectrum of participation. Participation will be effective if inclusion occurs. Unfortunately, even though the law regulates the space for public participation, there is no mechanism that explicitly regulates how the people's aspirations can be delivered and channeled in the planning of Regional Regulations. The law and regulation mentioning variety of channel for community participation but no of them are clearly defined.

The initiative for public involvement that is often carried out by local governments is through the holding of public consultations. The parties concerned with the discussion of certain regional regulations were invited to provide input on the substance of the regional regulations prepared. However, there is no formal arrangement that explains how the public consultation was conducted. So, the mechanism for public consultation depends on the commitment of the local government. Not mandatory to be implemented and it is reactive.

The main principle in environmental problems solving requires recognition and acceptance of people who are potentially affected by enactment of policies or activities. No matter how good the regulations on paper, it certain to fail (Mochamad, 2015). That way, the content of the Regional Regulation should include how the interests of the groups are accommodated. Refer to ladder of citizen participation (Arnstein (1969), degree of participation ranging from low to high. The ladder includes eight rungs that correspondent to degree of participation. The ladder is a guide to find out who has the power when decisions are being made. The top level of participation allows citizen to take control. Even though Sherry Arnstein noticed also how public could have different interests influenced by political, economic and social status differences that will affect the effectiveness of their participation. The perspective of the concept seeing the public as a single entity, that is different from government entities and private sectors.

How social inclusion and collaborative approach are relevant to building climate and disaster resilience

The climate change policy essentially prioritizes 'aspects of salvation' an area of threat posed. Mobilizing ideas to get the same response and understanding requires an adhesive element that is able to encourage the community collectively in the desired direction. The adhesive element in question is the needs and interests that are threatened by vulnerability, risks and impacts of climate change, especially on vulnerable groups. Awareness to maintain and continue their needs and interests, is built through the provision of knowledge so that a relatively balanced understanding arises. In the perspective of social capital theory, the value of social capital is not limited to weak or strong ties between individual societies (which are built by trust) but also good and right perceptions of a particular issue, so that social capital that is built can respond to the issue properly and correctly (Wolf et al, 2010).

That is, value is not only interpreted into supporting elements of social capital such as trust or leadership among communities but includes elements of understanding and knowledge that influence the running of social capital (which is affected by imbalances or inequalities in social landscapes and collective resources).

All people are share same potential to be affected of the threat of climate change. On the other hand, they also have the same potential to be a resource to adapt and make an impact. However, in the socio-political, economic and environmental perspectives, marginal groups are groups that are more vulnerable to becoming victims of adverse impacts because of their limited access. Therefore, social inclusion is crucial to be placed as an instrument towards policy and change that can accommodate both perspectives and knowledge, as a way to realize applicable policies and strategies.

In the discourses about social inclusion in Indonesia, the classification of community groups in it is a group of people who have a marginalized tendency in the policy making process because of the closure or limited access in the dimensions of education, economics, socio-politics and the environment which leads to the absence of asset protection and social networks. So that when they become affected of hydrometeorological disasters, such as floods, landslides, storms and high waves and long droughts, increasingly put pressure on poverty. In the case of flooding, not only damage the house or place they live, but also eliminates evidence of the house, land, education and other deeds which result in the difficulty of getting access to others.

Attention to policy desires that include the issue of social inclusion in policies and action plans for climate change adaptation and disaster risk reduction due to climate change is how to bring those who are marginalized into social life who have a more positive bargaining position and dynamics, and on the other hand, the main stream of stakeholders in the public policy perspective.

The realization of social inclusion is greatly influenced by the openness to the involvement of marginalized community groups. Through a collaborative approach compiled by the instrument in the policy making mechanism. The final form is collaborative governance. It means that the spirit of collaboration is formed through the pillars of social interaction, which is able to invite various stakeholders or stakeholders simultaneously in a forum with government officials to make joint decisions. (Ansell and Gash, 2007: 543).

Through a chart developed by Ratner and Smith (2014)] in the cycle of collaboration and resilience, it was stated that the desire to listen from parties, especially groups whose interests and positions have been difficult to represent is the first step in identifying obstacles and opportunities. The second stage is where the stakeholders engage in dialogue or discussion to explore the factors that become obstacles. After gaining the result, planning collaborative action takes place. The objective is to implement the strategies that have been discussed. This stage is still mandatory to include stakeholders.

Goldsmith and Kettl mentioned that there are important things that can be used as criteria for success in collaboration in governance, namely; Network structure; commitment to objectives, trust between stakeholders; governance; access to authority; Accountability; access to information; and access to resources (Goldsmith and Donald, 2009: 135-136).

In this perspective, social inclusion and collaborative approaches constitute a unified social capital. According to Berberyan (2012) it is important to explore what things can increase the adaptive capacity inherent in the community and how this capacity can be improved and strengthened until it is able to achieve additional external support. Social can create control rooms, including the use of natural resources. These conditions have the potential to create operationalization, efficiency, transparency, responsibility, legitimate authority and organizational participation at the national, regional and local levels (Pelling et al., 2008).

Through a group-based approach, the shock caused by climate change will be able to be suppressed by the potential to improve and overcome information barriers and facilitate access to agricultural and technological knowledge as a way of adapting to climate change. In some cases (Marther et al. 2012). Social capital (which recognizes social inclusion and collaborative approaches) is the key to change in accepting new technologies that are important in adapting to climate change. It means social groups can use it to help farmers to share knowledge and technology.

One element of the social group mentioned above is the civil society organizations that carry out their daily tasks and functions in advocating climate change adaptation policies and disaster risk reduction. Aspects of changing community culture are important to influence aspects of institutional instruments, policies and laws. Therefore, the task of mentoring and facilitating vulnerable is a must for the purposes of building awareness, understanding and capacity to build confidence for their involvement in the policy formulation process. The involvement should be equipped with adequate knowledge.

Although in general the constraints in mentoring and facilitating community groups are a matter of limited time and other resources, the emergence of leaders or champions among these vulnerable groups will help overcome the problem of sustainability. Information supply is much easier nowadays when digital technology and social media provide functions to community leaders to receive and deliver information.

From community level practices, there are few samples showing how resilience could be triggered through the approaches. Involvement of women groups during planning of village resilience in Ameth province of Maluku has successfully resulted a financial support to women's proposal to cultivate an intensive farming system in the villages. The farming is expected to meet the need of vegetables supplies for the people during extreme weather in this remote island that become isolated in such weather. Women ideas were different and tend to domestic domain compared to men who proposed building of a structure of seawall. Gender role that is socially constructed had bring different experience between the two.

To bringing up another sample, private sector collaboration in Konawe Selatan Southeast Sulawesi has provide the farmers support to cultivate a newly introduced maize farming system that is climate-proof. In some villages in Maluku, custom-based restriction to exploitation of some particular natural resources both in-land and the sea was enacted in village regulation resulted positive impact to reduce environmental degradation.

Review of Inclusiveness and Collaboration in the Making of Regional Regulations on Climate Change Adaptation and Disaster Risk Reduction

1. Draft Regional Regulation concerning the Roadmap to Climate Change Adaptation in Maluku Province

The substance of the Roadmap states that groups of poor people, women, indigenous people or persons with disabilities are the groups that need to be considered in climate change adaptation. A number of facts in the form of research findings such as women's limited access to economic facilities, especially for women who work in the «male» sector such as the sea. This condition is shaped by the stereotype that women are not the main seekers of domestic investment.

Moluccan life is thick with tradition and customs. Practices that refer to customs and traditions are reflected in the system of village governance to the habits adopted by the community. The CCA Roadmap explicitly gives recognition and recognition to these customary entities. The Roadmap document mentions a number of civil society organizations and custom structures that represent the interests of indigenous peoples. These organizations include; Green Mollucas, Alliance of National Indigenous Peoples, Baileo Maluku, Walang Perempuan, Community Supervisory Groups (Pokwasmas) and Kewang (customs-based guards) and some others.

The process of drafting Regional Regulations on this Roadmap itself reflects how the draft Regional Regulation includes various interest groups. It includes civil society organizations that support community empowerment, environmental, and customary sustainability. The groups represented by the organization are indicated as groups with weak bargaining position are disadvantaged while doing their efforts in conserving the environment and adapting to climate change.

Since the initial stage of the proposal, consultation and writing, concern on the disadvantaged groups has been highlighted in the Roadmap. Some of the groups mentioned above are included in the Roadmap drafting process. Some of the groups mentioned above are parties to the Roadmap drafting process, through a series of public consultations. Their role is mainly to provide input regarding the impact and potential of disadvantaged groups as capital in implementing adaptation strategies.

In terms of collaboration, the process and substance of the roadmap provide clear recognition of the strategic role of educational institutions and the private sector, research, community service, professional associations, expert groups etc. who are concern on climate change issue. Some groups indicated to be included are declared as partners who have the potential to be involved in the CCA. In addition, the private sector is seen as having the potential to contribute through the corporate social responsibility (CSR) scheme that they provided, and the banking sector can contribute in the form of business credit schemes to help communities maintain income sources amid climate change and disaster situations that disrupt sources source of livelihood, especially in the agriculture / plantation and marine sectors which are significantly affected.

The roadmap drafting team consists mainly of local climate change experts with the support of funding sources from the Ministry of Environment and Forestry and the USAID-APIK program. The drafting team was formalized through the Governor's Decree. This roadmap contains strategic directions for climate change mitigation and adaptation. While the more operational details are being prepared in the form of Regional Action Plans. In terms of the process, the stages follow the path of the roadmap drafting, including public consultations that have only been held once.

2. Social Inclusion and Collaboration Review in the Draft Regional Regulation on Climate Change Adaptation in Southeast Sulawesi Province

The preparation of the Regional Regulation on Climate Change Adaptation in Southeast Sulawesi was initiated by the Legislative. The joint work carried out by the USAID-APIK project for three years which aims to provide assistance, advocacy and pilot projects at the community level has succeeded in encouraging local governments to draft Local Regulation on Climate Change Adaptation. The plan to formulate this regulation has been included in the list of national legislation programs, so that it becomes a regional priority. Budget resources are also prepared by the local government.

The drafting of the Regional Regulation begins with the Academic Writing. This academic document is needed to provide a strong basis for the Regional Regulation (Perda) and its content. In drafting the academic texts, the local government appoints a core team consisting of a number of academics. The practice done in Indonesia's provinces, academics are generally professional partners who supporting the formulation of regional regulations.

In terms of this substance, academic texts state the need to adopt the focus of the Sustainable Development Goals (SDGs) into local regulations. Where education and health gaps are identified, especially access to water and sanitation for women and children.

The substance of the academic text states that farmers and fishermen are categorized as vulnerable groups that are potentially exposed to the negative impacts of climate change. The impact is shown through decreased production and catches due to reduced days of fishing caused by the bad weather. Furthermore, the productivity of these two source of income groups directly affects the decline in local food income and supply.

The climate and disaster resilience strategy proposed in the academic text focuses to people who live in remote areas and to those who have difficulties reaching the islands. The recommended strategy is providing inter-island transportation networks. Another focus in this academic paper is on urban communities with dense populations. The proposed strategy is rearranging the area and providing infrastructure in the form of drainage and health services.

Academic manuscripts that have been compiled have been through several limited consultation stages to get input from various parties. In this case, the consultation only involves the technical agencies implementing the local government (executive) and the legislative work unit. The USAID-APIK program helps provide input in terms of substance. However, in practice, the consultations held were not carried out by involving organizations that represent vulnerable groups stated in the academic text.

On the other hand, the previous stages that preceded the preparation of the academic text were studies of vulnerability and risk of climate change and disasters. This study was facilitated by the USAID-APIK project team. In all stages of the workshop organized to conduct the study, civil society organizations were involved to provide views on the vulnerability and risk profile of the vulnerable groups. In addition, the workshop also produced recommendations in the form of adaptation strategies for priority areas affected. So far, the resulting strategy has been linked to the needs of vulnerable groups. It's just that it still seems to need to synchronize the results of vulnerability studies with recommendations in the academic text.

The process of compiling this academic paper is accelerated because it is required to be completed in a short period of time. This is done to considerate the availability of the budget where the budget absorption period is limited. Therefore, the process tends to take quick steps.

Gap analysis

There are many obstacles not merely the formal procedure for vulnerable groups of people to participate and involve in the regulation making. Among the obstacles are the absences of facilities and lack of knowledge and writing skill. Hence, participation is really depending on the initiative of the decision makers whether or not to involve the vulnerable groups in the process and recognize them in the substance of the regulation.

There is an assumption that the voice of vulnerable communities has been represented by civil society organizations. In fact, some cases showing that the interests of civil society organizations not reflect true desires of those group of communities).

From the practices carried out in the two provinces, it appears that in terms of process and substance, the drafting of the local regulation on the Climate Change Adaptation Roadmap reflects more on how inclusiveness is pursued within the framework of partnership. In the creation of the Regional Regulation on Climate Change Adaptation in the Province of North Sulawesi, face challenges from the side of the available time frame. In the cycle of planning and budgeting a policy, there are deadlines that must be met. The consequences if the deadline is exceeded are mainly not possible for financing to be issued for the preparation process. Thus, the government tends to take a more pragmatic and quick step in order to hasten its resolution due to the high cost taken during the regional policies formulation process.

Therefore, a more inclusive process on the basis of collaboration is constrained. Consultation on the draft regional regulation is limited to the executive, legislative and drafting consultant teams from local universities. While external parties such as USAID-APIK have a limited role to support the substance and to provide a number of references for research in the preparation of academic texts which used as the basis for the preparation of Regional Regulations.

From a further opened practices done in Maluku Province, there is a gap where the involvement of private groups is still limited in terms of the need for resource mobilization that is required to support the implementation of regional adaptation strategies. In fact, the private sector has the potential to also be a disadvantaged group whose business operations are disrupted due to climate change and disaster exposure. Hence, the collaboration paradigm built should be shifted to private participation as part of the adapters by internalizing various forms of adjustment in their production chains that are threatened by the impacts of climate change and disasters. The recent discourses on private sector partnership might relevant to shift perspectives of the partnership under framework of potential shared-valued between the parties.

Conclusion

From the study above, here are some conclusions from the study of the process and substance of local regulations making in the two provinces where the study was conducted, as follows:

1. Social inclusion and collaborative approach are in line with the aim to building climate and disaster resilience, based on the perspective that the marginalized groups geographically, economically, gender, etc. have the same potential to receive the negative impacts of climate change and disasters. Each of the group received different impacts. While at the same time, these groups have the potential that can be utilized as capital in achieving resilience goals. Other groups considered as disadvantaged are potential partners because they have resources that can be mobilized in a collaboration scheme.

2. Social inclusion and collaborative approaches have to be created through the system, not on demand basis. The initiatives to organize public consultation by local authorities are an important mechanism as an instrument to build social inclusion and collaboration. However, it is necessary to ensure that participants represent social groups exposed to the negative impacts of climate change and disasters. In terms of the process, the regional regulations formulation that were studied in both provinces sought social inclusion and built collaborations with different levels of depth. In terms of substance, the content of local regulations reflects the views of local governments on the importance of social inclusion and building collaboration. It's just that obstacles are still encountered, especially on the budgeting process allocated to draft a regulation.

3. The gap can be seen mainly from the lack of specific strategies for social inclusion in local regulations. However, social groups that need attention have been identified. In addition, the perspective of involvement and partnership with the private sector is still limited to the need to mobilize external resources, not to use the private sector as a group that also has the potential to receive negative impacts from climate change and disasters. Therefore, they are not considered as adapter agents. Whereas the business that is managed also has risks to be exposed to various threats triggered by climate change and the occurrence of disasters.

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From Experience to Change: Lessons Learned from 2018 Mayon Volcanic Eruption

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Abstract

This study aimed to improve the disaster management practice and policy-making for Mayon volcanic eruption in the Province of Albay. After the decampment of the 2018 Mayon volcanic eruption, the local DRRM officers (LDRMOs) were asked to (1) describe the response activities of local government units (LGUs) during the eruption, (2) assess areas in their response operation, and (3) share highlights, lessons, and realizations during and after the response operation. These were captured through workshop forms (with guide questions and assessment matrix) and conduct of focus group discussion. Seven of nine LDRRMOs in the Mayon Cluster participated in the study.

Participants' answers were consolidated and analysed which resulted to (1) Association's proposed volcanic eruption response protocol for Mayon Cluster LGUs of Albay and (2) practice and policy recommendations for various operation areas: warning and advisories, communication and coordination, information management, evacuation management, disaster managers, infrastructure, and local policies and plans.

Experiences and lessons gathered in the study are contextual to the 2018 Volcanic Eruption of the Mayon Cluster. These practice and policy recommendations for the next preparedness and response operations are for the LGUs, national government agencies, non-government organizations, private donors, and other stakeholders to act upon.

Keywords: Mayon Volcano, Albay, lessons learned, volcanic eruption, response operation

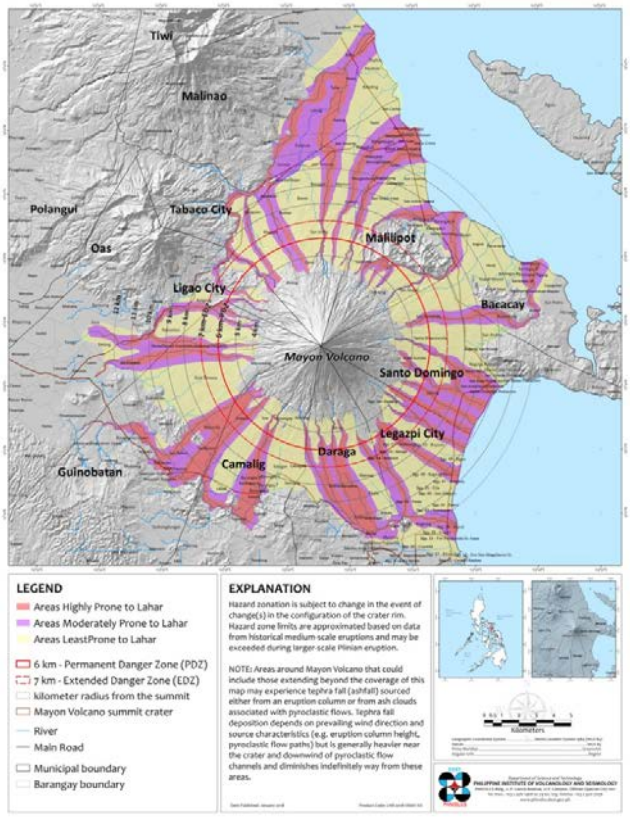
Introduction

Albay is one of the provinces of the Bicol Region located in the island of Luzon. It has a total land area of 2,554.06 square kilometres (Province of Albay, n.d.) accommodating its 1,314,826 population (Philippine Statistics Authority, 2015).

The province has scattered fertile plains and valleys but is generally mountainous. It has three major peaks located in the east coast, namely Mounts Mayon, Masaraga, and Malinao. There are also two peaks located in the west coast (Mount Catburawan and Mount Pantao) but are not as prominent compared to their east coast counterparts (Province of Albay, n.d.). Various natural hazards are present in the Province from hydrological, meteorological, climatological to geophysical hazards such as frequent volcanic eruption due to Mayon Volcano.

Considered as the most active volcano in the Philippines, Mayon is situated in the Province of Albay, Philippines (13°15.4'N, 123°41.1'E) — 300 km southeast of Manila (PHIVOLCS, 2017). It is a symmetrical volcano which rises to 2,462 meters above the Albay Gulf. With a 10-kilometer radius, it has a base circumference of 62.8 kilometres (PHIVOLCS, 2017) covering three cities (Tabaco, Legazpi, and Ligao) and six municipalities (Malilipot, Bacacay, Sto. Domingo, Daraga, Camalig, and Guinobatan). It is also home to about 277 flora and fauna species, some of which are endemic and threatened to vulnerable species (PNC-UNESCO, 2015).

Figure 1. Mayon volcano Lahar hazard map (PHIVOLCS, 2018)



The earliest recorded eruption of Mayon Volcano dates back to 1616. Its eruptions range from strombolian to basaltic plinian resulting to lava flows, pyroclastic flows, ash falls, and mudflows which affect lowland areas surrounding it (PHIVOLCS, 2017). In 1814, the most violent eruption of Mayon Volcano devastated several towns and killed almost 1,200 people. Since 1616, Mayon has had a recorded 52 major volcanic activities including its most recent this 2018.

On January 13, 2018, Mayon Volcano exploded a steam reaching 2.5-kilometer high with grayish plume. Three days after, the Provincial Government declared Albay under "State of Calamity". According to the National DRRM Council (2018), the eruption had affected a total of 23,075 families (90,742 individuals) in 61 barangays, some 17,308 families (66,486 individuals) of which were evacuated (inside and outside of public evacuation centres).

Due to phreatic explosions, lava effusions, and ash fall, there had been pre-emptive evacuations for humans and livestock, flight cancellations, and class suspensions within Albay and Camarines Sur (NDRRMC, 2018). About 74,010 learners and 2,732 education personnel in 64 schools within the six-kilometre permanent and nine-kilometre extended danger zones were affected. In agriculture, Albay incurred damages amounting to PHP 166,288,833.36 with a total of 10,443 farmers affected (NDRRMC, 2018).

When the Philippine Institute of Volcanology and Seismology (PHIVOLCS) lowered the Alert Level Status of Mayon from Level 3 (increased tendency towards eruption) to Level 2 (moderate unrest), Albay ordered Decampment on March 29, 2018 ending the 76-day Mayon volcanic eruption response operation.

Research Questions

This research asked, "From the perspective of the Local DRRM Officers of Albay, how do we improve the disaster management practices & policies in the Province for the next Mayon eruption? Specifically, this research sought to answer:

1. What were the response activities done by the local governments in the Mayon Cluster through their Local DRRM Offices?
2. What were the LDRRMOs assessment of various areas in the response operation?
3. What were the learnings & realizations of LDRRMOs after the 2018 Mayon volcanic eruption?

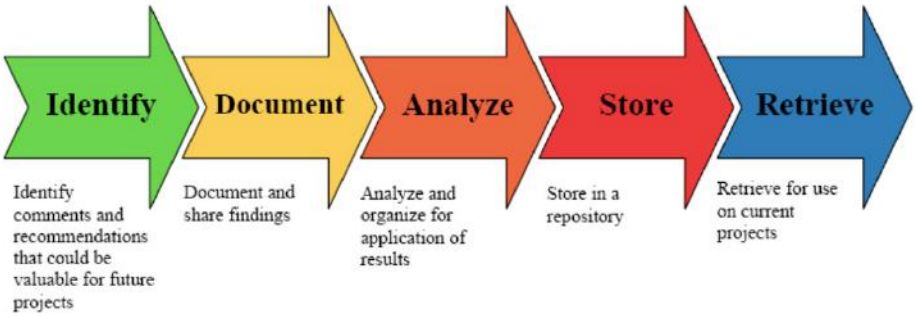
Research Objectives

This study aimed to improve the disaster management practice and policy-making for the next Mayon Volcanic Eruption. To achieve this, the study looked into the (1) response activities did by the Local DRRM Offices (LDRRMOs) in the Mayon Cluster; (2) assessment of the various areas in the response operation; and (3) learnings and realizations of the LDRRMOs after the 2018 Mayon volcanic eruption.

Research Framework

This research was anchored on the five-step lessons learned process by Rowe & Sikes (2006) as shown in Figure 2. The process started with when participants (1) identified valuable experiences and lessons from the 2018 Mayon response operations, (2) documented and shared their experience, assessments, and lessons learned to fellow DRRMOs, (3) when the researcher consolidated and analysed the data, (4) made the results available to the association members (online and offline) consist the storing, and (5) made the results available for retrieval for current and future use to improve practices and policies pertaining to Mayon volcanic eruption (Rowe & Sikes, 2006).

Figure 2. Lessons Learned Process (Rowes & Sikes, 2006)



Methods

In the 76-day Mayon Response Operation, the Albay Public Safety and Emergency Management Office (APSEMO) and the Local Association of DRRMOs of Albay (LADA) sought changes towards a more efficient and effective response operation for the next Mayon eruption. To identify the problems encountered, determine improvement points, and find ways to do it, the Provincial DRRM Officer Dr. Cedric D. Daep proposed to conduct a lesson learned workshop among the Mayon Cluster LDRRMOs.

Lessons learned workshop was conducted to help the Association see the positive and negative aspects in the response operations as well as create an avenue to discuss successes, unexpected results, and innovative suggestions for future response operations (White & Cohan, 2010). Conduct of the workshop is also an opportunity to talk about what could have been done differently, what were the causes of the problems experienced, and what could be done to avoid it in the future (White & Cohan, 2010).

For the participants to look back and reflect on what their LGUs did, assess various areas of the response operation, and gather and process collective realizations and lessons learned, the researcher sent out workshop forms with guide questions and assessment matrix. Guide questions dealt on (1) what their LGUs chronological actions were to respond to the hazard, (2) the positive and negative highlights of their operations, and (3) what their lessons and realizations from the operations were. The assessment matrix aimed to gather the things that went well and went wrong in various areas of operation.

Only seven out of nine LGUs in the Mayon cluster were able to participate in the study. Research participants who documented and answered the workshop forms were seven LDRRMOs from three cities (Legazpi, Tabaco, and Ligao) and four municipalities (Malilipot, Daraga, Camalig, and Sto. Domingo).

Through a focus group discussion (FGD) in one of the Association meetings, participant LDRRMOs shared the (1) chronological activities they did to respond, (2) assessment of various areas in the operation, and (3) lessons and realizations during and after the operation. The FGD was employed and designed to gather in-depth information from the participant Mayon Cluster LDRRMOs (Lindlof & Taylor, 2002).

Answers on the chronological activities done by LGUs to respond during the volcanic operation were consolidated. The good practices from LGUs were noted and integrated in the proposed plan. Activities were then listed in order of priority and urgency to be done. The duration of each activity is also shown in Table 1.

Highlights, lessons, realizations, and assessment of response areas were also consolidated and analysed which then yielded the practice and policy suggestions of this study.

Results & Discussion

Results of the workshop are presented in two parts: first is on how the LGUs responded during the eruption; and second is the proposed practice and policy recommendations are after assessing various areas of the operation and noting the highlights, lessons, and realizations.

Proposed Volcanic Eruption Response Protocol

Having different set-up in each of the local government, LGUs did activities in varying order and scale, the researcher consolidated the participants' answers and came up with proposed a step-by-step response to be done by LGUs for the next eruption response operation.

Presented in Table 1 is the Association's proposed volcanic eruption response protocol for Albay Mayon cluster LGUs. It lists the activities that have to be done in chronological order and for how long. The proposed protocol is a four-month action plan which aims to guide the local disaster leaders and managers in each city/municipality and even in the barangays.

Table 1. Proposed Volcanic Eruption Response Protocol for Albay Mayon Cluster LGUs

NO.	ACTIVITIES	MONTH 1										MONTH 2				MONTH 3				MONTH 4			
		Week 1							W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16
		D1	D2	D3	D4	D5	D6	D7															
1	Conduct meeting with the Local Chief Executive, Municipal DRRM Council, Barangay DRRMCs, and other stakeholders																						
2	Activate Operation Center for Monitoring, Warning, and Communication																						
3	Meet and reorient the Evacuation and Camp Management Committee regarding evacuation procedures																						
4	Issue evacuation advisories to residents within the danger zones																						
5	Tap PNP/BFP and barangay officials to maintain Peace and Order in the evacuation centers																						
6	Tap volunteers and MDRRMC rescue team to aid in communication																						
7	Draft relevant Executive Orders addressing specific needs in the LGU																						
8	Issue class suspension advisories to affected LGUs & schools																						
9	Conduct BDRRMC Meeting per Barangay (every after 2 weeks)																						
10	Evacuate residents from the PDZ and EDZ																						
11	Assess camp needs																						
12	Prepare & update master list of evacuees per evacuation center																						
13	Distribute relief goods																						
14	Install basic lifelines in evacuation centers																						
15	Monitor, coordinate, and report camp activities (Relief distribution, donation, etc)																						
16	Construct temporary shelters and temporary learning spaces (TLS) in evacuation centers																						
17	Establish communication systems in evacuation centers																						
18	Conduct psychosocial activities in evacuation centers																						
19	Conduct EC-, barangay-, and municipal-level meetings for updates and reports																						
20	Submit reports to concerned agencies																						
21	Resume classes in TLS																						
22	Implement alternative livelihood programs for affected families																						
23	Order & conduct of decampment (accdg. to Mayon alert level)																						
24	Update list of households and population at risk to lahar																						

Practice and Policy Recommendations

These practice and policy recommendations are a combination of the results of area assessments, highlights, lessons learned, and realizations of the participants. These recommendations are on warning and advisories, communication and coordination, information management, evacuation management, disaster managers, infrastructure, and local policies and plans.

Warning & Advisories. Warnings and advisories must be given in advance to give lead time for residents and LGUs to prepare. Monitoring devices and equipment for Mayon Volcano must always be in-place, functional, and regularly upgraded. Persons responsible for the monitoring and warning must always be on-site. Markings and signages for the permanent and extended danger zones must be properly delineated, conspicuous, and upgraded as well. It was also reiterated that the information dissemination must be done down to the barangay and household levels.

Communication and Coordination. Proper coordination must be observed by any actor who will be involved in the response operation. These actors must collaboratively set a clear communication and coordination protocol between and among LGUs, NGAs, NGOs, private donors, and other stakeholders during response operations to ensure the safety of people and efficiency of resource use (manpower, time, funds, goods, etc.). Another notable recommendation is for coordination meetings to be set in advance and be properly communicated to all involved to give lead time for the participants to prepare.

Information Management. LGUs shall (1) hire regular personnel with appropriate skills and qualifications to be in-charge of data gathering and information management, (2) allocate funds to upgrade the information technology (IT) equipment to be used, and (3) ensure that the LDRRMC secretariat has reliable and fast internet connectivity with or without power supply. Data flow protocol must also be established to ensure the maximum dissemination of information to all offices/ agencies needing it.

Evacuation Management is sub-divided into security, transportation, health, water and sanitation, and welfare goods distribution. Recommendations for each are discussed below:

> *Security.* Office of Civil Defense (OCD) V shall base their force augmentation proportional to the need of the LGUs and magnitude of hazard. The LGUs, in coordination with the police force and the barangay public safety office, shall deploy adequate number of security personnel and ensure proper scheduling of security forces at evacuation centres and barangays to prevent crime incidents, looting, and return of evacuees to their homes without decampment order yet. Camp managers shall orient evacuees to raise awareness on various possible security issues that might arise during their stay at the evacuation centres.
>
> *Transportation.* LGUs shall purchase additional vehicles to be used to (1) transport residents during evacuation and decampment and (2) welfare goods during pick-up, delivery, and distribution. They must also establish protocol on the proper use of the DRRM transport vehicle.
>
> *Health, Water, and Sanitation.* Restrooms, wash areas, and cooking areas in the evacuation centres must also be adequate and safe. Potable water supply must be available in or near the evacuation centre. Local health department and LGUs shall purchase needed medicine and upgrade health, water, and sanitation equipment. Medicines and health equipment shall also be prepositioned to areas that need those. Camp managers shall also (1) strictly follow the standard ratio of room-to-number of occupant ratio to prevent occurrence of diseases and (2) educate and empower evacuees to observe proper housekeeping, sanitation, and waste segregation while staying at the evacuation centres. Mental health must also be addressed by conducting regular and appropriate psycho-social activities.
>
> *Welfare Goods Distribution.* The LGU, through the local social welfare and development office, shall establish a centralized warehouse that can house all the welfare goods for ease of storage and accounting. On assistances given, donors and donated goods must be properly recorded and accounted for. During operations, the LGUs must hire additional manpower for faster pick-up, delivery, and distribution.

Disaster Managers. After the response operation, LGUs realized that they lack the adequate manpower to handle the long-term response operations. Factor contributing to this is the lack or limited government budget to hire adequate manpower (with regular employee status and adequate benefits) needed in the operation. This results to overworked and stressed DRRM personnel during response operation.

Infrastructure. The area of the LGU operation centres, where the disasters managers stay, must be large enough to cater various response activities (meetings, press briefings, proper sleeping area, kitchen dining, etc.). It is also recommended that LGUs must establish permanent evacuation centres (with adequate facilities and basic lifelines) outside school campuses and danger zones.

Local Policies and Plans. Suggestions that surfaced in local policy-making are (1) integration of risk assessment and procedures on evacuation and decampment to local DRRM and contingency plans and (2) for the Provincial Council to pass a resolution prohibiting the settlement of residents within the 6-kilometer permanent danger zone of the Mayon Volcano. LGUs and local councils should also update their respective policies before, during, and after response operations given the unforeseen changes in how operation works and how people behave. This shall be done in close coordination and consultation with line agencies and stakeholders.

Significant improvement points that surfaced for local planning are (1) risk assessments shall be integral part of the local DRRM and contingency plans of the city/municipality and barangays, (2) evacuation and decampment procedure for volcanic eruption shall be clearly stipulated and incorporated in the local plans and be properly communicated to the community members, (3) reorientation of barangay officials and camp managers on evacuation and camp management (evacuation-decampment procedures, assignment of evacuation centres, new legal issuances, and other protocols), and (4) residents currently living in the permanent and extended danger zones must be prioritized in the relocation efforts. Ultimately, LGUs realized that they should craft their plans to prevent disasters, not to respond to it.

Conclusion

Summary

This study aimed to improve the disaster management practice and policymaking in Albay for the next Mayon volcanic eruption. To achieve this, the researcher conducted a lesson learned activity by distributing workshop forms with questions about their response activities, assessment of various areas of operation, and realizations during and after it. Their output was shared through a focus group discussion together with LDRRMOs from non-Mayon cluster. Participants' answers were consolidated and analysed which resulted to (1) Association's proposed volcanic eruption response protocol for Mayon Cluster LGUs of Albay and (2) practice and policy recommendations for various operation areas: warning and advisories, communication and coordination, information management, evacuation management, disaster managers, infrastructure, and local policies and plans.

Scope and Delimitation

This study was conducted to get the perspective of the LDRRMOs on how the disaster management practice and policy-making for volcanic eruption in Albay can further be improved. Experiences and lessons gathered in this study are contextual to the 2018 Mayon Volcanic Eruption of the seven towns and cities in the Province of Albay. This research was done to look at the bigger picture of what happened in the Mayon response operation, identify the things that the actors (local governments and other offices) did well, and find ways to improve the policies (or the lack of it) and practices that did not work.

Recommendations

This study could further be improved if the Office of Civil Defense V will conduct lessons learned workshop and invite all stakeholders involved in the response operations from NGAs, LGUs, NGOs, barangay officials and residents (especially evacuees) to further broaden and deepen the perspective of the study. This would pave for a more collaborative approach to learning from our experiences towards improving our practices and policies.

Results of this study will be submitted to (1) the local chief executives of the nine LGUs in the Mayon Cluster, (2) Provincial Government of Albay through the Office of the Governor (executive branch) and the Office of the Vice-Governor (legislative branch), (3) Office of Civil Defense – Regional Office V, (4) national line agencies in the Province, and other stakeholders for them to study and further act on the Association's suggestions towards improving the practices and policies for the next Mayon response operations.

Furthermore, conduct of lessons learned workshops should be done after major disaster event that happen in the Province, so we can analyse the response operation that happened, learn from it, and further improve our disaster management practices and policies.

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Annexes

Provincial of Albay
Albay Public Safety and Emergency Management Office
Local Association of DRRM Officers of Albay

MAYON ERUPTION 2018

Lessons Learned Workshop
Date of Presentation: April 21, 2018 I Venue: Rapu, Albay

Guide Questions:

1. How did your LGU respond to the Mayon Volcanic Eruption? Please narrate in brief the chronological activities that your LGU/Council/Office had done.
2. What were the highlights of your Mayon Eruption Operation? Please state positive and negative highlights.
3. What were your LGU's MDRRMC's, nd your realizations after the Mayon Eruption Operations?

Assessment Matrix

CATEGORIES/IMPROVEMENT AREAS	WHAT WENT WRONG?	WHAT WENT RIGHT	WHAT NEEDS TO BE IMPROVED
Warning & Advisories			
Communication & Information			
Reporting and Data Management			
Coordination • With LGU • With Lother LGUs • With PGA • With NGAs • With NGOs and donors			
Evacuation Management			
A. Security			
B. Transportation			
C. Health/Water & Sanitation			
D. Relief Operations			
Policies in-place			
Funds/Assistance Management			
Role of Non-Mayon Cluster/ DRRMOs			
Other Issues and Concerns			

Incorporating Scientific Research Outputs into Emergency Preparedness and Response Planning: Two Case Studies on Nuclear Accident Consequence Assessment

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Thailand Institute of Nuclear Technology

Abstract

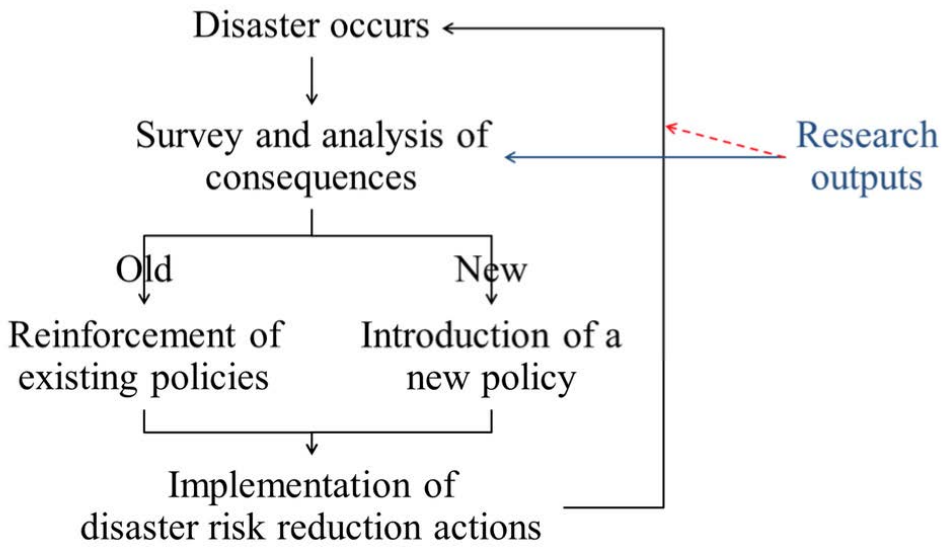
Disaster risk management policy has been designed and implemented after the occurrence of disasters to avoid or mitigate the consequences should they happen in the future. In some cases, scientific research outputs are considered during the policy design process, though they are not sufficiently utilized in most cases. This trend can also be observed in policy related to nuclear emergency preparedness and response (EPR). This paper aims to emphasize the significance of incorporating scientific research outputs into disaster management policy making before the occurrence of the disaster, using case studies on nuclear accident consequence assessment. Consequences of accidents when scientific insights are and are not considered are compared. The first case demonstrates the way to use time-dependent statistical information to balance the public radiation exposure after a hypothetical accident with the number of people forced to relocate and the size of area to be decontaminated. The second case discusses the example result from the benchmark problem assessment of the ASEAN Network on Nuclear Power Safety Research (ASEAN NPSR) which indicate the possibility of significant consequences in some specific locations far away from the origin point of the radiological release after a hypothetical accident (so called hot spots). These case studies demonstrate the potential contribution of scientific research outputs to the optimization of the disaster risk management policy and imply that a practical regional cooperation in disaster risk management may start from the scientific community which is typically easier.

Keywords: emergency preparedness and response, research output, nuclear accident

Introduction

Thailand is not considered a disaster-prone country, since it is not located on the Ring of Fire, and thus large earthquakes or volcanic eruptions can hardly be observed. However, it has been affected by tsunami several times, recently by the 2004 Indian Ocean Tsunami which seriously damaged properties in Pang Nga and Phuket (Suppasri et al., 2015). Thailand is also prone to freshwater floods due to its tropical location and the influence of seasonal monsoon rains (Gale and Saunders, 2013). Having limited experience in disaster risk management, disaster risk reduction policies and action plans are normally designed and implemented after the occurrence of the disasters. In some cases, outputs from scientific and technical research are considered during the policy design process in order to achieve more optimized and efficient policy, though they are not sufficiently utilized in most cases. Figure 1 shows a typical flow of the way scientific research outputs are incorporated into disaster policy making. Once the disaster occurs, surveys of consequences from the disaster are conducted, followed by the analysis of those consequences to design risk reduction strategy. At this stage, related scientific research outputs, if any, are utilized. For example, the National Disaster Warning Center (NDWC) was established after the 2004 tsunami (Suppasri et al., 2015) as scientific studies indicated the importance of an early warning system. In other cases, the policy is determined based on measures being used in the past. Higher walls are planned to be built around previously-flooded industrial estates after the 2011 severe flood covering 65 provinces, even though scientific studies emphasize the significance of political, social and cultural aspects (Phanthuwongpakdee, 2016). This trend of designing disaster risk reduction policy after the occurrence of the disaster can also be observed in policy making for nuclear emergency preparedness and response (EPR). Japan established the Nuclear Emergency Warning Headquarters and several Prefectural Nuclear Emergency Response Headquarters, along with the line of command in which the cooperation between the central and the local headquarters was explicitly described (Fukui Prefectural Government, 2018) soon after the accident at the Fukushima Daiichi Nuclear Power Station in 2011 (Fukushima Accident).

Figure 1. **Typical flow of incorporating scientific research outputs into disaster policy making.**



However, recent findings from disaster-prone countries, e.g. Japan, Chile, indicate the importance of incorporating science, technology and innovation into policy making on natural disaster management, and suggest introducing the concept of disaster resilience in order to design a systematic disaster risk reduction scheme which plans for the prevention, mitigation and adaptation of the community even before the disasters occur (United Nations Office for Disaster Risk Reduction, 2015). This practice is also being introduced to man-made and technological disasters (United Nations Office for Disaster Risk Reduction, 2018). Our ongoing study on adding resilience index to the framework of nuclear accident consequence assessment has revealed useful findings that can contribute to nuclear accident risk reduction (Silva and Vechgama, 2018). Therefore, this paper aims to emphasize the significance of incorporating scientific research outputs into disaster management policy making before the occurrence of the disaster, using case studies on nuclear accident consequence assessment.

Method

Two case studies on nuclear accident consequence assessment are used to demonstrate the usefulness of scientific research outputs when incorporated into disaster management policy making: one is the application of resilience metrics to nuclear accident consequence assessment, and the other is the identification of the region affected by a hypothetical radiological release after a nuclear accident. Consequences of a nuclear accident when the typical disaster management policy is applied are compared with consequences when the scientific insights from the two case studies are considered. Quantitative comparison is shown in the first case study, while the second case study provides only qualitative discussion.

Results

Application of Resilience Metrics to Nuclear Accident Consequence Assessment

Resilience Metrics. Figure 2 shows the transition of system resilience discussed in this study. The system resilience can be measured by the figure-of-merit (F(t)), and resilience actions are defined as actions to bring the system to the stable state (Henry and Ramirez- Marquez, 2012). The figure-of-merit at the stable original state (F(t0)) is set to 1. Figures-of-merit and resilience actions in this study are shown in Table 1. The four figures-of-merit are labelled as: radiation exposure resilience index, relocated people resilience index, relocated area resilience index, and land contamination resilience index. Costs associated with relocation are the relocation cost and the psychological effect compensation, and cost associated with decontamination is the decontamination cost. Further detail on the resilience metrics can be found in Silva and Vechgama (2018).

Figure 2. **Transition of system resilience (adapted from Henry and Ramirez-Marquez, 2012).**

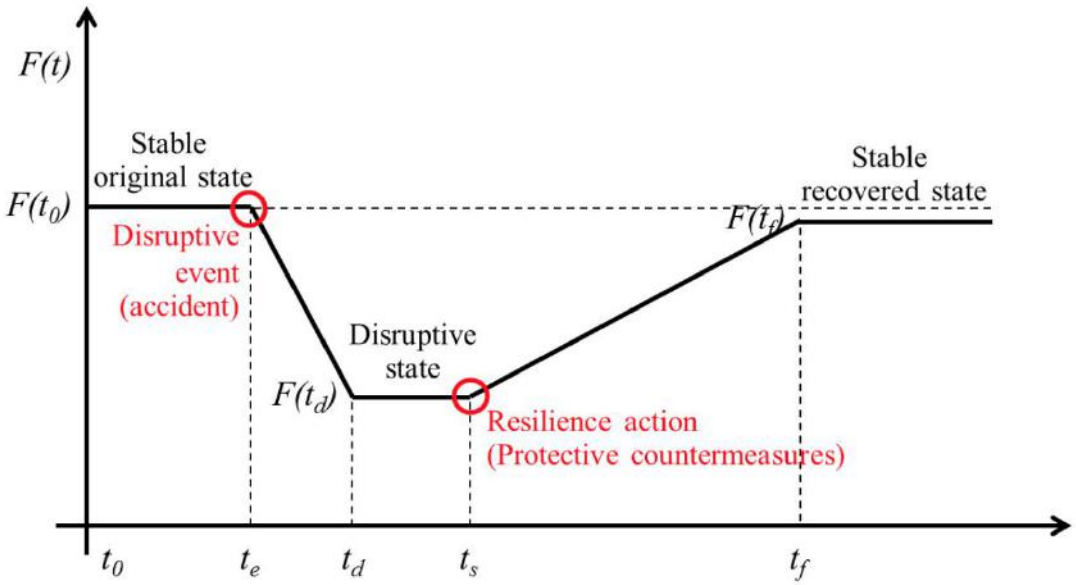


Table 1: **Figures-of-merit and respective resilience actions (Silva and Vechgama, 2018)**

Figures-of-merit (F(t))	Resilience actions
Number of people being exposed to radiation dose over the prescribed dose limit	Relocation, decontamination
Number of relocated people	Decontamination
Size of relocated area	Decontamination
Size of contaminated area	Decontamination

Table 2: **Conditions for the Evaluation of Resilience Indices (Cases A – C)**

Conditions	A	B	C
Relocation initiation dose [mSv/y]	20	100	20
Relocation lifting dose [mSv/y]	20	20	1

Conditions. Conditions for the evaluation of resilience indices are shown in Table 2. Relocation initiation dose, relocation lifting dose and dose limit are varied within the range recommended by the International Commission on Radiological Protection (2007). Values in case A are those adopted by the Japanese Government after the Fukushima Accident (Nuclear Emergency Response Headquarters, 2011).

Results. The changes of the four resilience indices when varying the relocation initiation and lifting doses are shown in Figure 3, while the relative costs associated with relocation and decontamination are shown in Table 3.

Figure 3. Changes of resilience indices when relocation initiation and lifting doses are varied.

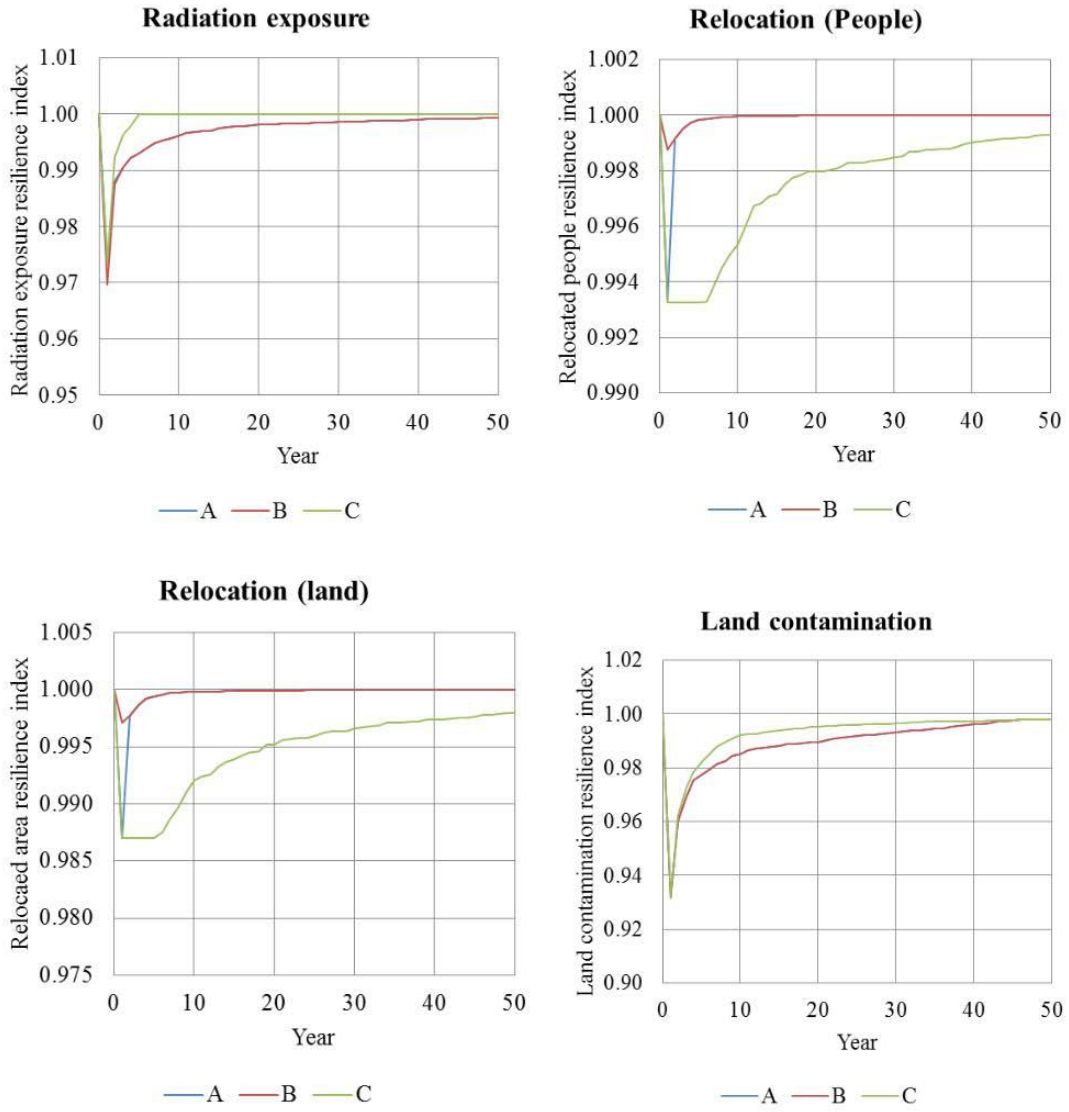
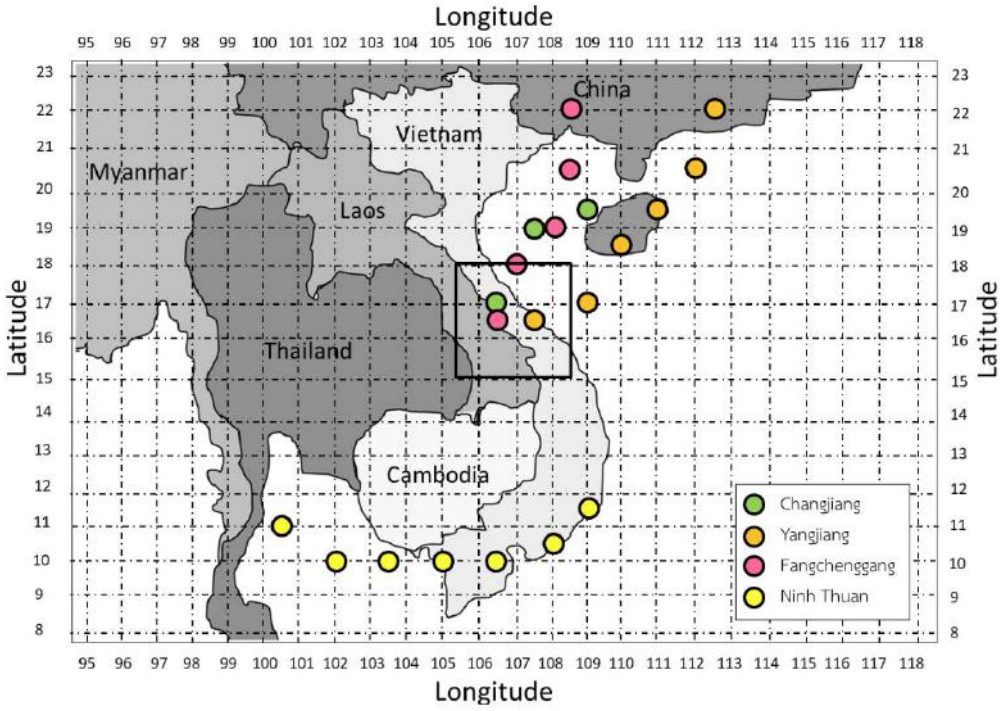


Table 3: Relative Cost of Resilience when the Relocation Cost of Case A is set to 1 (Cases A – C)

Relative cost of resilience	A	B	C
Relocation cost	1.00	0.37	6.44
Psychological effect compensation	0.59	0.42	3.06
Decontamination cost	11.27	11.27	157.83

Figure 4. Most probable dispersion routes of the radioactive plume from a hypothetical accident in Changjiang, Yangjiang, Fangchenggang and Ninh Thuan Nuclear Power Plants.



Identification of Affected Region by a Hypothetical Radiological Release

In order to identify the affected region in ASEAN countries by a hypothetical radiological release, the authors first selected Ninh Thuan Nuclear Power Plant which was planned to be constructed in Ninh Thuan Province, Vietnam, and three existing nuclear power plants which are within 500 kilometers from the border of ASEAN region, namely Changjiang, Yangjiang, Fangchenggang and Ninh Thuan Nuclear Power Plants, as the targets of the assessment. An unmitigated long-term station blackout accident, one of the most likely accident scenarios in a pressurized water reactor (United States Nuclear Regulatory Commission, 2012), was used to determine the hypothetical radiological release. 2.45 x 1015 Bq of cesium-137 was assumed to be released from the reactor constantly for 26 hours. Meteorological data was taken from the website of the National Oceanic and Atmospheric Administration (NOAA). The most probable dispersion routes obtained from the simulation are shown in Figure 4 (Khunsrimek, 2018). This work was a part of the 2017 Benchmark Problem assessment under the ASEAN Network on Nuclear Power Safety Research (ASEAN NPSR).

Discussion

Application of Resilience Metrics to Nuclear Accident Consequence Assessment

It can be seen in Figure 3 that all resilience indices make a sharp decrease on the first year and bounce back gradually. Land contamination takes more time to recover comparing to radiation exposure and relocation. This is because the contaminated area after a nuclear accident is typically very large, and it thus takes time to decontaminate. When the relocation initiation dose is increased from 20 mSv/year to 100 mSv/year (case B), the radiation exposure resilience index hardly differs from case A, while the peak on the first year of the relocated people and area significantly decrease. The relocation cost also reduces to approximately one-third (see Table 3). On the other hand, the decrease of the relocation lifting dose from 20 mSv/year to 1 mSv/year (case C) significantly delays the return of relocated people and the increases the decontamination cost by one order, though the reduction in radiation exposure and the acceleration in land contamination recovery are limited. The results imply that a larger value of relocation initiation dose can be adopted in order to reduce the scale of the relocation without significantly increasing the radiation exposure. The relocation lifting dose should also be maximized so as not to delay the relocation, and to limit the decontamination cost. These findings can be reflected to the design of nuclear EPR policy. Likewise, the study on balancing among chronic health impacts (including psychological effects), relocation of people and recovery of the area can help optimize the disaster management strategy for other types of disasters. Scientific research outputs can suggest options that minimize the expenses without significantly deteriorating the resilience of the community.

Conclusions

Significance of incorporating scientific research outputs into disaster management policy was demonstrated using two case studies on nuclear accident consequence assessment: one is the inclusion of resilience metrics to the framework of nuclear accident consequence assessment, and the other is the identification of the region affected by a hypothetical radiological release after a nuclear accident. In the former case, it was found that the simulation of resilience indices helps determine the balance among radiation exposure, relocation and area decontamination.

This can help design the nuclear emergency response scheme for nuclear power plants. In the latter case, the most probable dispersion routes can help identify the area where Thailand and Vietnam need to focus when considering the national nuclear EPR strategy. The results can be shared to the ASEAN Network of Regulatory Bodies on Atomic Energy (ASEANTOM) to help design the regional nuclear EPR strategy. The two case studies show the potential of the scientific research outputs to optimize the nuclear EPR strategy at local, national and regional levels. The way scientific research outputs are applied to the policy development in the two case studies can be used as a showcase for other types of disasters.

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Challenges in Climate Information Services (CIS) Provisioning in Philippines Agriculture Focus on Role of Municipal Agricultural Office

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University of the Philippines Visayas *(Joy Lizada)*
University of Southeastern Philippines *(Purisima Bayacag)*
Mariano Marcos State University *(Julius Manzano)*

Abstract

Climate change adversely affects the agricultural sector as precipitation patterns, temperature and extreme weather events have a direct influence on the likelihood of short-run crop failure and long run production decline. Although there will be gains in some crops in some regions of the world, the overall impacts of climate change on agriculture are expected to be negative, threatening global food security (Nelson et al. 2009). Increasing variability in weather patterns and frequency of extreme climatic events pose tragic consequences for households' food security, livelihoods, and over-all welfare. In the Philippines, small farming households are the most vulnerable to such aftermath and are hence needful of means to adapt and mitigate the effects of climate change.

Without access to reliable and consistent climate information, farm-level adaptation decision-making operates under a great deal of uncertainty, rendering farmers as helpless hostages to the changing climate. Weather forecasts, utilized together with a range of other tools and methods, can enhance decision making and improve overall risk management in agriculture (Klopper, et al., 2006). Accurate forecasts of weather 3–6 months ahead of a cropping season can allow farmers and others in agriculture to make decisions to mitigate adverse impacts or exploit possible favourable weather conditions (Jones, 2000).

The Philippines has in recent years seen some headway made toward establishing and utilizing long term climate information in promoting resilience, particularly for small farming households in the countryside. Substantial investment was made by the Department of Agriculture in installing about 100 automatic weather stations across the country, for gathering of daily local weather data. Piloting efforts such as the USAID-funded Bicol Agri-Water Project (BAWP) have demonstrated how weather forecast information, when incorporated into an extension advisory bulletin for farmers, can enable them to make informed coping and adaption decisions in farming.

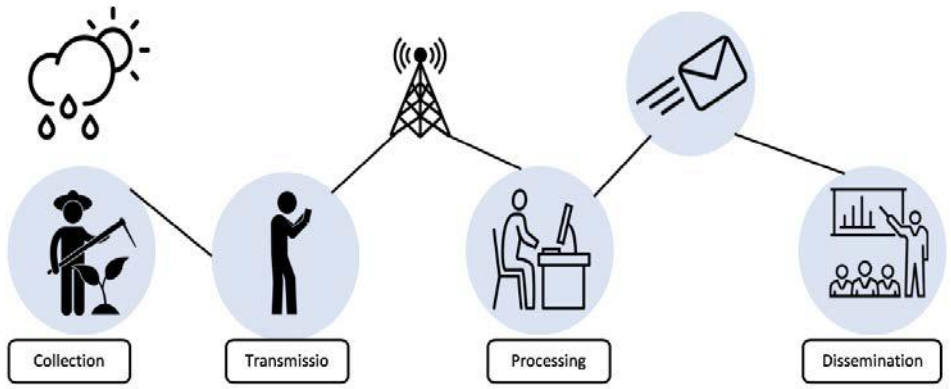
Mainstreaming the delivery of weather information services to farmers through decision support tools like extension advisory bulletins underscores science, technology and governance as the three necessary areas of innovations for community adaptation to climate change (Rola, et al., 2017). Such prospect rests on the shape and stock of existing infrastructures that can enable the realization of more climate resilient farming communities. This paper characterizes the state of the art of climate data generation, transmission, and climate information dissemination for use by the agriculture sector in the Philippines. It describes the distribution and specifications of available climate information gathering equipment in the study sites. It looks into the roles and perspectives of actors of the system: the data generators, data processors, information communicators and information users. Finally, it assesses current issues and concerns of climate information users, largely from the perspective of local extension workers.

Analytical Framework

Climate variables that affect agriculture consist of rainfall, temperature, windspeed, solar radiation and other variables that can be measured by the Automatic Weather Station (AWS). Amongst this, rainfall is the most important as water from the rains determine the start of the planting season especially for rainfed areas. As well, rainfall data is more robust that the data of other weather variables.

Rainfall quantity and its spatial distribution are important indicators for determining the onset of a rainy season. This affects farming systems and crop and livestock production. However, rainfall varies temporally and spatially. The onset of a rainy season varies from one cropping season to another within a specific location. Rainfall amount on site may be far different from those recorded in weather stations located more than 25 km away due to varying environmental and geological conditions. Installation of weather instruments such as the Automatic Weather Station (AWS) within farming communities will thus help farmers monitor the local amount of rainfall, providing the type of specific climate information they need (Faderogao et al. 2017). Ideally, climate data will be transmitted to the weather agency for processing through climate forecast model. At the municipal level, dissemination will usually be through the municipal agricultural office (Figure 1).

Figure 1: Climate Information System: data collection, transmission, processing and dissemination
(Source: Faderogao et al. 2017)



Climate users like farmers can develop informed decisions utilizing climate information in overall agricultural management. Farmers need a reliable advisory on the onset of rainy season before they start land preparation and planting.

Methodology

The study is conducted under the Climate Information Services (CIS) Project of the second phase of the Adaptation and Mitigation (AMIA2) in Agriculture Program of the Philippines' Department of Agriculture (DA). It covered ten provinces across the country: Ilocos Sur, Isabela, Tarlac, Quezon, Camarines Sur, Iloilo, Negros Occidental, Bukidnon, Davao del Norte, and North Cotabato. Selection of the study sites was based on the AMIA2 program-level goal of targeting potential areas for coordinated adaptation and mitigation interventions by various national agencies. The CIS Project visited 44 weather data collection instruments in the 10 study provinces.

Key informant interviews (KIIs) were conducted to gather information about the availability and physical condition of the weather data collection instruments/facilities such as the automatic weather stations (AWS), agrometeorological stations, and rain gauges in the study sites. Respondents included 27 municipal agriculture officers and regional field officers of DA, 36 operators of climate data collection equipment, and 30 agricultural extension workers. The questionnaire also included questions on technical specifications of the equipment.

A related farmer survey was also conducted in the project sites to establish baseline information on CIS knowledge, attitudes and practices of farmers regarding CIS and climate change adaptation.

Results and Discussion

Adequacy of Weather Data Collection Instruments

The national agency, Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA) manages a total of 503 weather data collection instruments and facilities scattered all over the country, including 187 unit of automatic rain gauges and 155 units of AWS. Figure 2 shows the locations of the weather data collection instruments all over the country installed and upgraded through the Agromet – cum Climate Change Project vis a vis AWS units visited by the CIS Project.

A general selection criteria for AWS sites was developed and provided by PAGASA (Nota, et al., 2012) as follows: 1) site is fairly level, not regularly flooded, and free from obstruction i.e., distance of AWS should be at least 4 times the height of obstruction; 2) site has a grass cover and no tall weeds nor covered in concrete, asphalt or crushed stone; 3) site must be in the east-west direction so no obstruction can cast shadows during the greater part of the day; 4) site is accessible to all means of transportation and secure; 5) site should be representative of the natural conditions in the agricultural region; 6) recipient agency is willing to provide an observer for manual reading of standard rain gauge and for overseeing the operation and maintenance of the instrument; 7) site must have strong cellular network signal; 8) site has no right-of-way issue or a usufruct agreement from the owner is available. However, these criteria do not include how far an instrument can be installed relative to another. It was observed that there are municipalities having two AWSs located adjacent to each other, which is contrary to what could be expected from what informants' report as the 5-kilometer radius associated with reading accuracy of an AWS. When probed, respondents at the local government office report that adjacent instruments in question were project-funded and there was no system in place regarding where instruments can be installed relative to another. Other respondents at the municipal governments were not aware of the number or location of the weather data collection instruments their area, citing tendency of implementing agencies to skip courtesy visits to their offices for proper local monitoring of the number and specific locations of installed instruments.

Challenges in the operation and maintenance of instruments

The AWS consists of four sensors to measure the weather parameters (Figure 3). It consists of a multi-parameter sensor used to measure the solar radiation, wind speed, wind direction, air pressure, air temperature and humidity. The AWS also has sensors for rainfall, sunshine duration, soil moisture, and temperature. It has a main controller that communication through the cellular network and a data logging system through flash memory downloadable via USB device. Automatic data transmission is carried out and configured via text messaging through a micro controller-based intelligent system board. The AWS has a battery and a solar panel, which play a vital role in the functionality of the whole instrument and the accuracy of the data that the instrument will produce.

Instrument observers or operators during the KII were asked regarding the functionality of the climate data instruments they handle (Table 4). More than half of the respondents (56%) rated the equipment as functioning smoothly since the first day of operation. Among the reasons provided by respondents for equipment functionality is the proper location of the equipment (25%), which validates the site selection criteria provided by PAGASA. Other reasons for the functionality were that the equipment was newly installed, of good quality, and is well monitored. Instruments that do not use a SIM card, that is, not dependent on automatic transmission through text messaging, were also associated by some respondents with high functionality. Such response highlights the automatic transmission feature of the AWS, which is highly dependent on communication and electric power infrastructures. Unfortunately, consistent and strong cellular network signals across the country has yet to be realized. It also does not help that the cellular network access is through prepaid SIM cards, which may expire if not regularly loaded by the operating local agency. Moreover, extended power outages can interrupt text message transmissions of climate information.

Maintenance of the weather instruments requires technical expertise from agencies like the Bureau of Soil and Water Management and PAGASA. Some maintenance work is also being done by the assigned observer or agricultural technician, mainly for basic upkeep of the equipment. Table 4 summarizes the maintenance information for the weather data collection instruments. Majority (86%) of the respondents' report performing regular maintenance work for their instrument. Since AWS is automated, some respondents (29%) perform regular maintenance work only when necessary. About 19% of the respondents reported doing daily and monthly cleaning. Other responses indicate less frequent schedules of cleaning such as quarterly, after every calibration, and annually. Majority (77%) of respondents said that the kind of maintenance work they mostly perform is cleaning the instrument's surface area. About 26% of the respondents' report weeding as their maintenance work. Removing pests, replacing of batteries and repairing the equipment were also considered as maintenance work.

Despite the maintenance done, there were still problems that arise due to normal wear and tear of the instruments or human intervention. Table 5 shows the observers' responses when asked what problems they have encountered that influenced the non-functioning of the equipment. The main problem that the respondents cited was stability of power source and hardware wear and tear due to pest (40%). Insects like ants were found inside some parts of the instruments that cause the problem. One respondent added that the reason why ants thrive inside the instruments is due to the cold temperature inside it. Spiders and other insects can also interfere with the rotation of the sensor that determines the wind speed and direction. Some of the AWSs are not solar- powered and the batteries became defective, so the stability of power source is considered as another problem. Thirty-seven percent of the respondents answered that internet connection is also one of their problems for they cannot transmit or download data offline. Defective parts of the instruments were also mentioned. When asked about how they addressed local problems mentioned, most respondents contact a technical staff, and for tasks like cleaning and replacement of batteries, they do it themselves.

Transmission, analysis and use of climate data

Data generated by the AWS are automatically transmitted to the Central Office via text messaging. This office creates a back- up for the data and then uploads it to the internet that can be accessed by the end users of the weather data like the national agencies, local governments and the general public (Figure 4). Data can be accessed through government websites like (http://agromet.da.gov.ph/), and (http://fmon.asti.dost.gov.ph/).

In the case of the agrometeorological stations, gathered climate data are recorded and transmitted manually. Data on sky cover, wind speed and direction, minimum and maximum temperature, dry bulb, wet bulb, dew point, vapor pressure, relative humidity, water temperature, rainfall, evaporation, sunshine, and mean sea level (MSL) are collected every day and sent through SMS, Single Sideband (SSB) radiophone or Transmission Control Protocol/Internet Protocol (TCP/IP) for production of short-term forecasts. The observers also encode the data collected in monthly weather data forms to be sent to PAGASA Central office climatology for processing and analysis. Data are stored at the stations for researchers and other users. Processed and analysed data in the form of weather forecasts, warnings, advisories and other information are disseminated through the Office of the Civil Defense (OCD), other public agencies, the media and in the PAGASA and their field stations. The agriculture sector is known to be increasingly tapping into these climate information, particularly the 10-day forecasts from PAGASA for use of public agencies in extension advisories.

Of the local extension workers interviewed by the study team, only about 37% confirmed being able to access the 10-day weather forecast from PAGASA. For those who received the forecasts, information was further distributed to all the departments in the municipal government and to all barangay (village) leaders. Interviews revealed that most recipient municipal local government units (MLGUs) used the 10-day weather forecasts to give advisory to farmers as well as for disaster risk management. About 10% of the recipient MLGUs specifically use the climate information for their rice-focused extension projects. Some of the local extension workers reported being able to subscribe to daily weather forecasts from PAGASA through text messages. Other respondents mentioned receiving weather forecast information from PAGASA only in the event of an anticipated typhoon passing by their area. Respondents were likewise aware that regular forecasts can be sent by PAGASA upon request of the municipal government, which in some cases have not been done yet.

With regard to the climate information directly gathered from the AWS, agrometeorological stations, and rain gauges, local planning and extension workers recognized its use for research purposes (53%), disaster advisories (17%), weather and climate forecasting (14%), planning, and instruction in Farmer Field Schools (FFS). A small number of the respondents were not much aware of the uses of the climate data from the equipment. Interestingly, none of the respondents mentioned use of the data for use in extension advisories to farmers.

Weather information is also observed to have micro or very location specific patterns. Centralization of data analysis may sometimes deter recognition of this very local weather information and the corresponding impacts. Therefore, decentralization of the data analysis of weather variables will be able to connect the location specific information with the weather advisory in a very quick turn- around time.

Role of agricultural extension in providing climate information to farmers

Access to seasonal climate forecasts can benefit farmers by allowing them to make more informed decisions about their farming practices (Gunda, et al., 2017). With this in mind, the CIS study team inquired with local agricultural extension workers on how extension advisories for the farmers are formulated, with a mind toward locating the use if climate information in the process. Table 9 shows that some 23% formulate advisories based on climate information from PAGASA that are disseminated through radio and television broadcasts. Some of them depend on the DA regional office for information. About 10% based their advisories on climate data from AWS, local knowledge (13%) and previous trainings (10%). A few other answers named the local disaster risk reduction management office and the municipal agriculture office as source of data for extension.

When asked about the reason for not using climate data from the locally installed climate data collecting equipment, most of the interviewed extension workers (42%) indicated lack of access (Table 9). Climate data from the locally installed climate data collector were automatically sent to a central server, with the expectation that anybody can access this. However, users need to have a good internet connection to be able to access the data. Five percent responded that they only have raw data, but they don't have the expertise to process it, highlighting the need to build local capacities for processing of climate data for use in informing for farmers' decisions.

Local extension workers were also interviewed about their assessment of the responsiveness of farmer-clients to climate information-based extension advisories. Majority of the respondents (57%) indicated that farmers who received climate information-based extension advisories exhibit high responsiveness to the information. One of the main reasons provided was that farmers' experience of climate-related problems in production have become aware of climate information (27%). Among the farm household decisions that local extension workers perceive as influenced by the climate advisories involve planting, availment of crop insurance coverage, pest management, fertilizer application, preparation for rain, and use of organic technology. A related study looks into farmers' actual knowledge, practice and perspectives in making sense of how climate information can inform their production decisions.

Conclusion

Based on the results of the study, the CIS in the Philippines needs some improvement. More AWS will be needed to capture the micro climate. More funds will be needed to maintain the equipment. More capacity building will be needed to maintain the equipment and for the municipal extension to level up so it will have more competence to send the climate information advisory to the farmers.

Weather data collection instruments are vital in generating climate information such as the 10-day weather forecast, climate forecast and climate extension advisories. There are a lot of instruments all over the Philippines, but these are owned by different entities. Therefore, the data coming from these are not usually accessible to the public sector.

Access to climate information can be improved through much needed upgrading of the internet infrastructure in the country. Local users of climate information bemoan poor and unstable internet connection in their area. Radio and television broadcasts of daily weather forecasts remain the most common source of climate information for local users. which are less location specific than data that is generated by equipment like the AWS. Local users also capacity building assistance in the processing of climate data into information for farmers' decisions.

From the perspective of local extension workers dealing with them, farmers, particularly those who have experienced adverse effects of poor climatic conditions, may be highly disposed to depend on available climate information in making key decisions in farming. These findings bolster the rationale for development of local seasonal climate forecasts and extension delivery that can be collaboratively initiated by the national and local governments, so farmers can adapt to the vagaries of climate change.

But beyond climate change and the farmers' adaptation to this, the overarching challenge is the social injustice that could sometimes drive farmers out of agriculture. This is due to the land conversion where policies are more favourable to the industrial and commercial purposes. In the Philippines, we are still awaiting the enactment of the National Land Use policy, where agricultural lands are protected from any change in use. This will promote social justice for farmers wanting to remain in farming.

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Annexes

Table 1: PAGASA Weather Data Collection Instruments/Facilities

Type	No
Synoptic Stations	57
Agromet Stations	23
Upper air stations	8
Automatic Weather Stations	155
Automatic Rain Gauge	187
Water level sensors	47
Wind profiler	1
Wind tunnel	1
Automatic Weather Observing System	2
High Frequency Doppler Radar	2
Marine buoys	2
Mobile Doppler radars	2
Doppler Weather radars	16

Source: PAGASA Profile 2016 from PAGASA Central Office

Table 2: Number of AWS distributed per region by the Agromet-cum Climate Change Project

Region	Number of AWS			Total
	Lufft	Upgraded ASTI AWS	Upgraded PAGASA AWS	
NCR	7	0	0	7
CAR	5	2	1	8
ARMM	3	1	0	4
Region 1	8	0	2	10
Region 2	9	1	2	12
Region 3	11	1	1	13
Region 4a	8	1	1	10
Region 4b	7	4	1	12
Region 5	7	4	2	13
Region 6	13	4	2	19
Region 7	7	1	0	8
Region 8	10	4	2	16
Region 9	8	2	0	10
Region 10	8	2	1	11
Region 11	9	1	2	12
Region 12	10	2	2	14
Region 13	7	4	1	12
TOTAL	**137**	**34**	**20**	**191**

Source: http://www.agromet.da.gov.ph/viewdata/ (Accessed date: Oct. 25, 2017)

Table 3: Number and percentage of weather data collection instrument/facilities visited by the CIS Project team.

Regions	Weather data collection instruments/facilities					
	AWS		Agromet/rain gauge		Total	
	n	%	n	%	n	%
Region 1	1	3.6	1	6.3	2	4.5
Region 2	3	10.7	1	6.3	4	9.1
Region 3	1	3.6	2	12.5	3	6.8
Region 4a	2	7.1	1	6.3	3	6.8
Region 5	4	14.3	1	6.3	5	11.4
Region 6	10	35.7	5	31.3	15	34.1
Region 10	3	10.7	3	18.8	6	13.6
Region 11	1	3.6	1	6.3	2	4.5
Region 12	3	10.7	1	6.3	4	9.1
Total	**28**	**100.0**	**16**	**100.0**	**44**	**100.0**

Figure 1. Agromet Station and AWS in the Philippines (left) and Agromet Station and AWS covered by the CIS Study (right).

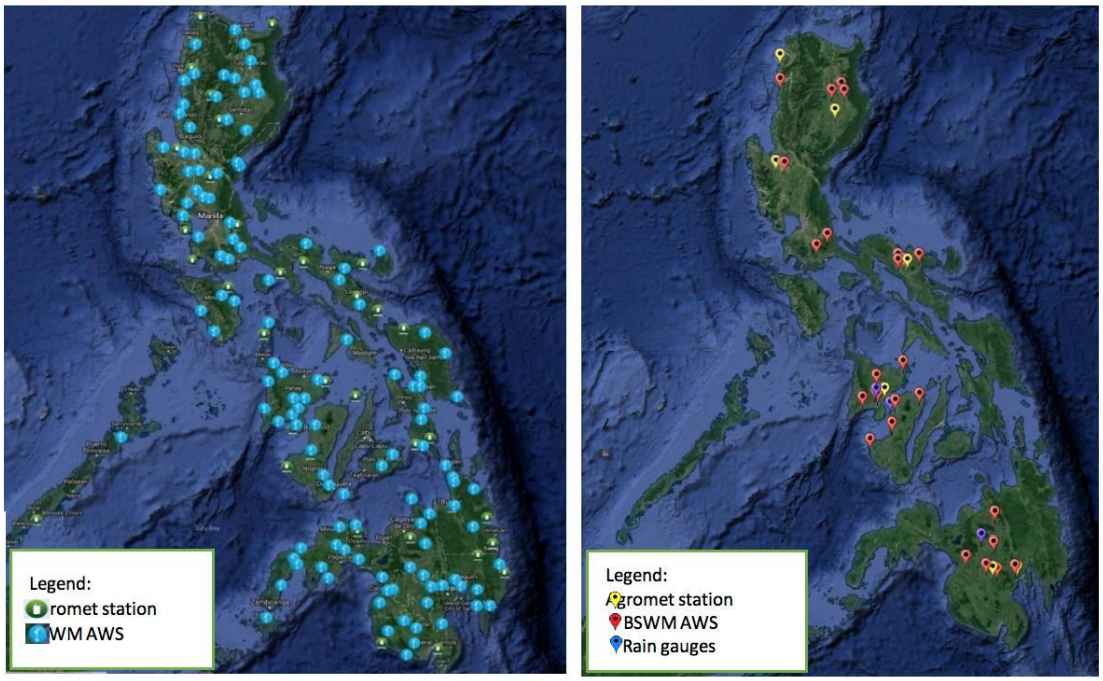

Figure 2. Parts of the Automatic weather station Source: DOST-ASTI as cited by BSWM

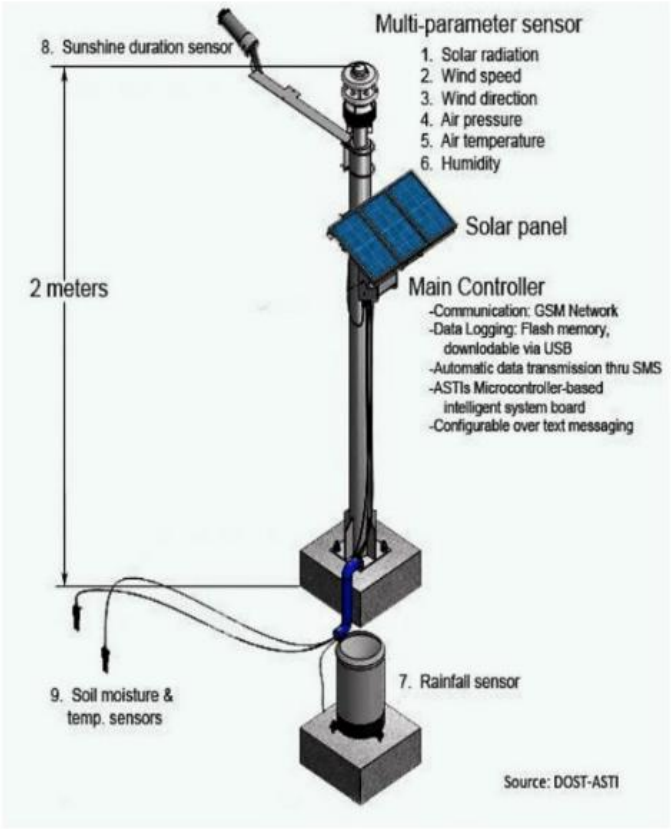

Table 4: Maintenance of the climate data instrument

	N	Percent
Is the equipment been functioning smoothly?		
Yes	20	55.6
No	16	44.4
Total	36	100.0
If yes, what do you think would explain such performance?		
Well-maintained	11	55.0
Proper location	5	25.0
Others	4	20.0
Total	20	100.0

	N	Percent
Does the AWS undergo regular maintenance work?		
Yes	31	86.1
No	5	13.9
Total	36	100.0
If yes, how often?		
When necessary	9	29.0
Daily	6	19.4
Monthly	6	19.4
Weekly	4	12.9
Annually	2	6.5
Others	4	12.9
Total	31	100.0
Kind of maintenance done		
Cleaning of equipment	24	77.4
Weeding	8	25.8
Repair for minor damage	2	6.5
Remove pests	2	6.5
Replace batteries	1	3.2
No response	2	6.5
Who provides the maintenance?		
Operator	15	48.4
DOST-PAGASA personnel	6	19.4
DA personnel	5	16.1
Others	5	16.1
Total	**31**	**100.0**

Table 5: Problems encountered and how these were resolved.

Particulars	N	Percent
Problems		
Stability of power source	7	43.8
Hardware wear & tear due to pests	7	43.8
Internet connection	6	37.5
Defective parts	3	18.8
No response	2	12.5
Others	4	25.0
How problems were resolved		
Contact technical staff	7	43.8
Clean equipment	7	43.8
Battery replacement	3	18.8
No response	1	6.3

Figure 3: Flow of weather data from AWS to the end users. Source: Nota, et al., 2016 (BSWM Online)

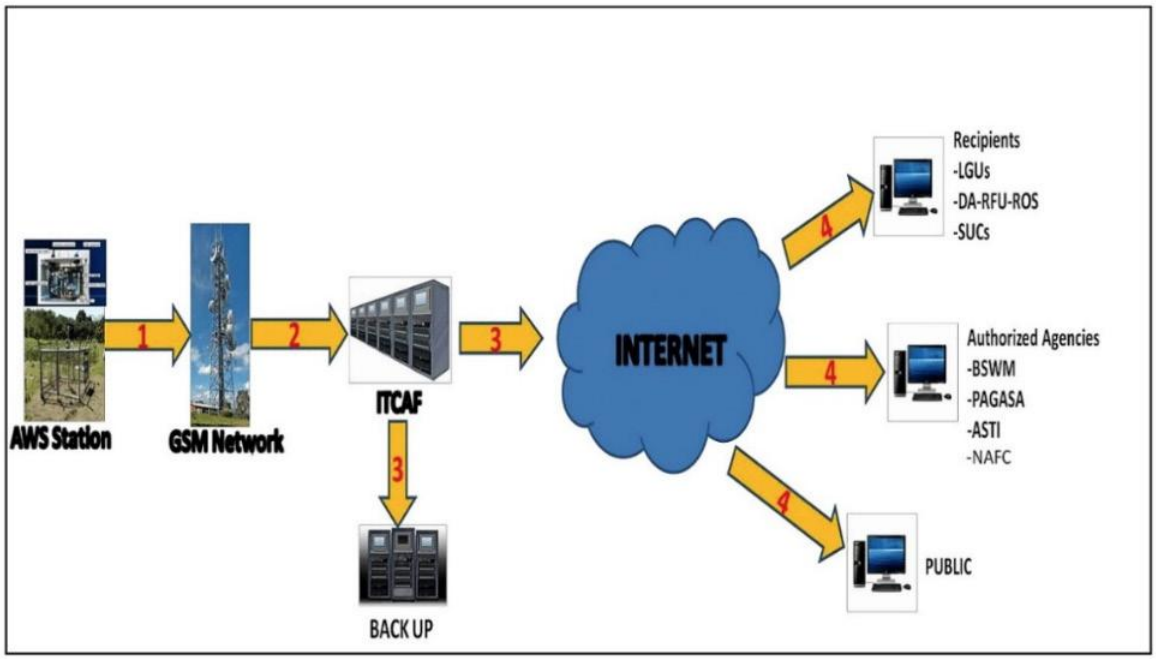

Figure 4. PAGASA data/ information flow diagram
Source: Engineering Technical Services Division, PAGASA

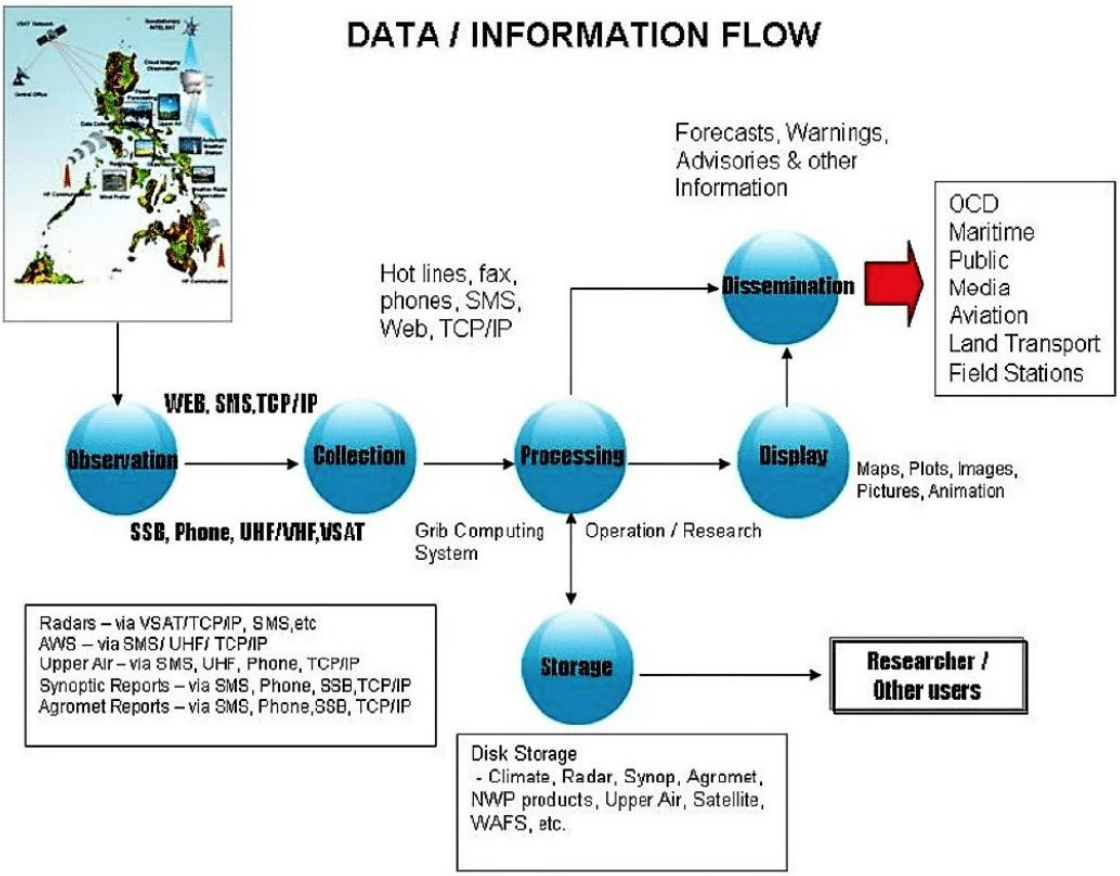

Table 6. **Knowledge of operators regarding data generated and storage**

Particulars	AWS		Agromet	
	n	Percent	n	Percent
Climate data generated*				
Rainfall Amount, Duration, and Intensity	28	100.0	16	100.0
Air Humidity	27	96.4	6	37.5
Air Temperature	23	82.1	10	62.5
Solar Radiation	22	78.6	7	43.8
Soil Moisture and Temperature	22	78.6	3	18.8
Wind Speed and Direction	22	78.6	10	62.5
Air Pressure	20	71.4	4	25.0
Sunshine Duration	18	64.3	4	25.0
Evaporation	2	7.1	5	31.3
Where the data was saved				
ASTI website	7	25.0		
BSWM Central Office	6	21.4	2	12.5
Computer/ Logbook	3	10.7	3	18.8
Weather Philippines Website	2	7.1		
Sim card /memory card	2	7.1		
PAGASA server and MAO	2	7.1	4	25.0
ARQ	2	7.1		
DA-RFO			3	18.8
Others	4	14.3	4	25.0

Table 7: **Climate information received by the provincial and municipal governments in the CIS study sites.**

Particulars	N	Percent
Municipality as recipient of the 10 day weather forecast from PAGASA?		
Yes	10	37.0
No	16	59.3
Don't know	1	3.7
Total	27	100.0
Use of the 10-day weather forecast by the MLGU?		
Advisory of MDRRMO	4	40.0
Advisory for farmers and residents of the municipality	5	50.0
Used in rice projects	1	10.0
Total	10	100.0
Users of Climate data according to respondents		
Farmers and Fisherfolks	11	40.7
MDRRMO	7	25.9
MAO	11	40.7
Academe	3	11.1
Others	7	25.9
None	1	3.7
No response	2	7.4
Don't know	2	7.4

*Multiple response

Table 8: Responses on the use of data generated from the climate data instruments

Particulars	N	Percent
Who uses the data?*		
LGU	12	33.3
Academe	10	27.8
BSWM	7	19.4
Farmers	7	19.4
Private companies	7	19.4
DRRMO	4	11.1
PAGASA	4	11.1
Others	9	25.0
How is data used?		
Research purposes	19	52.8
Disaster advisory	6	16.7
Forecasting	5	13.9
No idea	1	2.8
No response	2	5.6
Don't know	1	2.8
Others	2	5.6
Total	36	100.0

*Multiple response

Table 9: Formulation of seasonal forecast advisories and farmers' responsiveness to these advisories

Particulars	N	%
How do you formulate climate forecast advisories? *		
Based on climate data from AWS	3	10.0
Based on climate information from PAGASA through radio/TV	7	23.3
Based on info from DA	7	23.3
Based on local knowledge	4	13.3
Based on the data provided by CDRRMO monitoring stations	2	6.7
Through the information from the MAO	2	6.7
Through trainings	3	10.0
No response	6	20.0
Others	6	20.0
Do you make use of information from locally installed AWS/rain gauge for forecast advisory?		
Yes	11	36.7
No	19	63.3
Total	30	100.0
What are the reasons for not using data from local AWS/rain gauge?		
Lack of knowledge of processing data	1	5.3
Data are not given to them	8	42.1
Incomplete data	2	10.5
No response	8	42.1
Total	19	100.0
How responsive are farmer-clients to climate information-based extension advisories?		
Very responsive	17	56.7
Responsive due to experience and awareness	8	26.7
No response	5	16.7
Total	30	100.0
What kinds of farm household decisions have you observed to be influenced by such advisories? *		
Crop insurance decisions	10	33.3
Planting decisions	21	70.0
No response	7	23.3
Others	4	13.3

*Multiple response

Abstract Only -- The value of collective and individual assets in building urban community resilience

Wijitbusaba Marome, Diane Archer, Boonanan Natakun, and Nuttavikhom Phanthuwongpakdee

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Abstracts

This paper aims to understand how organised urban communities in Bangkok are planning for and responding to environmental and other crises, in order to identify approaches to fostering more sustainable, inclusive and resilient urban development. The Bangkok Metropolitan Region (BMR), an area with a population of 10.07 million (2007) and Thailand's economic and political capital city, is at risk from the impacts of climate change, alongside other environmental hazards including pollution of air and waterways. The BMR has faced such hazards before, notably the 2011 floods, and the likelihood of future such events is high. It is important to ensure that all residents of the BMR are able to prepare for future potential shocks, and that no one gets left behind. For those on lower-incomes, who may not have access to support systems such as disaster insurance, being able to make optimum use of existing assets, at the individual and collective level, can offer an opportunity for successful coping and adaptation strategies in the face of future shocks. Drawing on Stein and Moser (2014), the authors seek to demonstrate that lower-income population groups are already taking actions to cope and adapt using their assets in response to current and future hazards to a certain extent, and that such approaches can be an entry point for cooperation between these communities and other stakeholders, including local government, local NGOs and other institutions.

This paper explores how low-income communities in Bangkok prepare for a potential shock such as flooding, drought or an economic crisis. Which individual and collective assets– internal and external – are at risk, and which can be used to overcome those risks? Do residents apply mechanisms of coping, adapting, or something new, and is collective action applied? The data draws from a household survey and interviews across three communities which have engaged in the government-funded participatory slum upgrading program, Baan Mankong. In particular, the study seeks to answer the following research questions:

1) What are existing adaptive mechanisms of households for crises? 2) Do communities have collective resilience strategies and what role do community assets play? The research study also led to the testing and development of an innovative resilience toolkit that can be used to foster community dialogue around what is required to achieve community-based resilience strategies. Known as 'Kin dee you dee' (live well, eat well), the interactive community-level toolkit focuses on seven types of assets used by community residents and their potential for building resilience: water, food, shelter and people, economic resources, community assets, and new resources made from old (for example, by recycling materials).

Thailand's two extensive coastlines (along the Gulf of Thailand and the Andaman Sea) make large areas of the country susceptible to the impacts of climate change, such as sea level rise and flooding, as has been documented by Marome (2013). Situated along the Gulf of Thailand, the Bangkok Metropolitan Region (BMR) is an economic hub that has already experienced significant flood events and is particularly vulnerable to sea-level rise, compounded by subsidence, in addition to urban heat island effects. People living in low-income communities, especially those who live along canals, are often most exposed as their dwellings and infrastructure are not adapted to climate change. This combination of factors means that ensuring Thai cities plan for resilient and inclusive growth is imperative to sustainable urban future. Unfortunately, such action has not yet transpired (Marome, 2017).

Keywords: resilience, adaptation, urban, inclusive, urban climate governance, Bangkok, assets

Abstract Only -- Towards Disaster Resilience: The role of Multi Donor Trust Fund for Indonesia Disaster Management

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Abstract

Within the last decades, Multi-donor trust funds (MDTFs) have emerged to a popular aid modality in many developing countries. Facing multi-sectoral difficulties in the aftermath of crisis, many countries have relied on MDTFs to help alleviating the post-crisis condition. In Indonesia, MDTFs have been involved in the country's development, particularly in disaster management related activities. Amongst of the existing MDTFs in Indonesia are: Multi-Donor Trust Fund for Aceh and North Sumatra (MDTFANS) (2005 – 2010) which contributed in Tsunami and Earthquake recovery in Nias and Aceh through Rehabilitation and Reconstruction Agency (BRR); Java Reconstruction Fund (JRF) (2006 – 2011) which aimed to assist in rebuilding and improving the living conditions of the people affected by the disasters in Java Island such as Yogyakarta (Mt.Merapi Eruption); as well as Indonesia Multi Donor Fund Facility for Disaster Recovery (IMDFF-DR) (2010 – 2018) which has national scope of work and has contributed to reconstruction programs (REKOMPAK) in Sinabung and Yogyakarta. Distributing ample amount of funding, MDTFs possess a great potential to finance disaster management effort. However, these MDTFs are not seen solely as aid modality in terms of funding but also regarding assistance in technical and human resources. With such potential, MDTFs have become an important component within DRM context. Thus, an intriguing question arises: as a promising and reliable source of disaster aid, how far MDTF has contributed to building disaster resilience in Indonesia? To investigate this, the study carried out an analysis through desk study, drawing lessons learned and experience from the existing MDTFs coupled with theoretical analysis from disaster management and resilience point of view. Realizing the importance of local context, the study is also complemented with analysis from the perspective from Indonesia's constitution. Evidence was found pointing out the function of MDTFs in building resilience in terms of social, economic and physical capital. However, there is no direct contribution in building resilience for human and environment capital due to the characteristic of MDTFs that focus more on disaster relief action. To optimize the function of MDTFs in building resilience, we suggest broadening the scope of work to be in national level and expand the working coverage to include pre-disaster management activities.

Keywords: funding, recovery, reconstruction, disaster resilience, capital

GRADUATE STUDENTS' PAPERS

A Critical Analysis on the Process of Integration of the Aeta Community and their Local Knowledge in the Local Disaster Risk Reduction and Management Plan of the Municipality of Porac, Pampanga

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Abstract

The Philippines is included in the list of countries most devastated by disasters worldwide based on recent global statistics on disasters and its impacts for the year 2017. Consequently, as a result of the extreme disaster events in the previous years, disaster policies in the Philippines were implemented that leads to a top-down approach to Disaster Risk Reduction and Management (DRRM). This means that the strategies being utilized in the field of disaster risk reduction are dependent on military chains of command and technocratic methods. Granted, these methods are effective in addressing large-scale disasters, however, they fail to integrate the marginalized sectors and their capacities such as local knowledge, in the decision-making process from the national level down to the local level. Thus, there are still numerous indigenous cultural communities being disregarded in development plans and policymaking in terms of disasters, even if they are the ones immensely affected by disaster risks. To investigate and substantiate this problem in a particular context, this research study analyses the planning, policy formulation, and implementation of the Local Disaster Risk Reduction and Management Plan (LDRRMP) of the municipality of Porac, Pampanga, where Aeta communities can be found. Gaillard and Mercer's road map towards an inclusive and integrated disaster risk reduction is used as a guide and reference in producing the interview questions and in conducting a thematic analysis of the findings of the study. A desk review and key informant interviews with four local government officials are conducted for the primary and secondary data collection. A nonprobability sampling method, specifically purposive sampling, is used by the researcher for the selection of the key informants. The findings of the study indicate that the Aeta community is integrated in the DRRM programs and activities of the municipality by means of their representatives such as the Barangay Captains and the Indigenous Peoples Mandatory Representative (IPMR), who are included in the implementation of the plan. However, the participation accorded to them is limited to the dissemination of information and knowledge coming from those at the top. Hence, the transmission of information and knowledge is one-sided and there is no mutual exchange of both scientific and local knowledge between the Municipal Disaster Risk Reduction and Management Council and the Aeta community. The municipality is at an early stage of integrating the Aeta community in the LDRRMP and for them to take it a step further, it is imperative to focus on the root causes of disasters and to enhance the existing capacities of the Aeta community.

Author's Note

This research study is an abridged version of the author's Undergraduate Thesis submitted in fulfilment of the requirements for the Degree of Bachelor of Arts to the Development Studies Program in Ateneo de Manila University for the school year 2017 to 2018.

Introduction

In a country that is geologically volatile and stricken by approximately twenty tropical cyclones every year, it is usual for the Philippines to perceive disasters as a result of the threats of Nature or natural hazards. The occurrence of disasters in the Philippines is often explained by pointing out the fact that the Philippines is in the typhoon belt, as well as in the Pacific Ring of Fire. Additionally, social scientists concentrate on people's perception of risk and how they adapt, with an emphasis on hazard-related risks such as the magnitude, duration, and frequency of hazards. It is assumed that the people with a low risk perception adapt badly to the threat, whereas those with a high perception of risk are expected to adapt easily. Hence, there is a dominant understanding that the extent of damage and human casualties that follow a disaster are caused by both the extremes of Nature and the low perception of threat along with insufficient behaviours[2]. This understanding however, proves to be detrimental for everyone as it shapes how disaster risk reduction policies are made in the Philippines.

Disaster Policies in the Philippines

In our country, the policies on disaster are operated by civil protection institutions such as the Office of Civil Defense (OCD), which is particularly responsible for safeguarding the implementation and monitoring of the National Disaster Risk Reduction and Management Plan (NDRRMP). This means that we are heavily reliant on military chains of command and military control over disaster policies. Thus, the strategies employed in preventing disasters in the Philippines centre on technocratic measures like technology-based warning systems, engineering structures, land-use planning and risk awareness campaigns which are based on hazards[3]. Likewise, mitigation strategies involve infrastructure development and high-tech solutions grounded on scientific information. Granted, these scientific and technical solutions are effective in protecting lives from natural hazards, however, they need to be supplemented by actions that deal with the risks encompassing the hazard and aspects of vulnerability. One significant factor that tackles such risks and enhances the resilience of a community is their local knowledge.

The Philippine Disaster Risk Reduction and Management Act of 2010, also known as Republic Act 10121, implements an approach in DRR that is all-inclusive, cohesive, and proactive, with the goal of diminishing the social, economic, and environmental effects of disasters. In fact, there are entry points for the integration of local knowledge specified in the state policies of RA 10121[4]. The NDRRMP for 2011-2028 provides guidelines for the nation to attain sustainable development by way of inclusive growth that develops the capabilities of communities, amplifies the resilience of vulnerable groups, and enhances opportunities for disaster mitigation[5]. Hence, there is a recognition of local knowledge in the NDRRMP and other policies in RA 10121, however, this local knowledge is vaguely understood, and there is no indication of any specific and concrete operationalizations in utilizing local knowledge in DRRM activities.

The Marginalized Sector: Their Vulnerability, Capacity, and Local Knowledge

It is necessary to note that the indigenous peoples (IPs) inhabiting remote islands and regions are the most affected by disaster events, given that they occupy marginal and delicate ecosystems. For instance, the upland barangays where the Aeta community reside in the municipality of Porac, Pampanga, are areas with dangerous or critical slopes. Moreover, there are no designated routes in any of the upland barangays, so it is practically difficult and challenging to reach the Aeta community. Nonetheless, the indigenous communities should not be perceived as being "vulnerable" to natural hazards, but rather as "ecosystem peoples" who are knowledgeable of and have a close relationship with their environment. They possess the necessary knowledge and skills, which they acquired from the experiences of previous generations, to cope with and respond proactively to disaster events. However, since several indigenous communities are distant in a social and political context from the majority in society, the national, regional, as well as local plans, despite being well-intended, may turn out to be inadequate in addressing the disaster risks facing these communities. Hence, it is imperative to assess the Disaster Risk Reduction and Management (DRRM) Plan of some local municipalities where IP communities can be found.

2. Gaillard, JC, 2011. People's response to disasters: Vulnerability, capacities and resilience in the Philippine context. Angeles City, Pampanga: Center for Kapampangan Studies, Holy Angel University.
3. Ibid., pp. 31-33.
4. Those state policies include: (1) making sure that actions for DRR and climate change are responsive to gender, aware of indigenous knowledge practices, and respect human rights (Sec. 2 j); (2) involve Civil Society Organizations (CSOs), private sector, and volunteers in the programs for DRR (Sec. 2 m); (3) advancing and supporting the capabilities of marginalized and vulnerable sectors for mitigation, preparation, response and recovery from disasters (Sec. 2 n).
5. Hiwasaki et al., 2014. Local and indigenous knowledge for community resilience: Hydro-meteorological disaster risk reduction and climate change adaptation in coastal and small island communities. Jakarta, UNESCO.

Research Question

The study strives to answer the research question which asks: How is the Aeta community integrated (i.e. through participation and representation) in the LDRRMP of Porac, Pampanga? The principal objective of answering the research question is to look into the current approach of the DRRM Council of Porac, Pampanga, in the planning, formulation, and implementation of their LDRRMP, and their perspective on the integration of local knowledge to be used as an entry point for the participation of the local community, specifically the Aeta community, in their DRRM policies and programs.

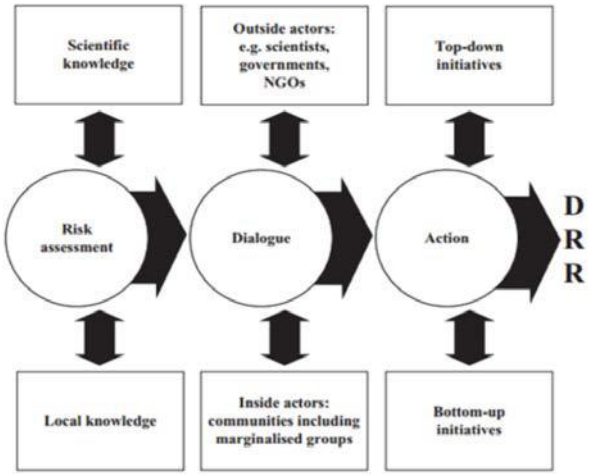
Empirical and Theoretical Significance

This work is important considering that there are still several IP communities being neglected or overlooked, whether systematically or not, in regional and local development plans and policymaking in terms of disasters, even if they are the ones chiefly affected by disaster risks. One case in point is the Agta indigenous people in Casiguran, Philippines. Their community is greatly prone to the risks of various natural hazards such as storms, inundations, and mudslides. However, instead of remaining vulnerable or helpless, they make use of their local knowledge to cope and take action against the impacts of disaster events. Disappointingly, the processes of the local government in making decisions and plans in the field of disaster risk reduction and management or DRRM, disregard the knowledge and context of the Agta people. The lack of opportunity for them to participate in the decision-making process of the local government in DRRM sets them in a more dangerous condition and may actually harm the sustainability of their sources of living[6]. Even though it is instructed in the NDRRMP of 2011-2028[7] that indigenous practices on DRRM can be used as a non-monetary resource to achieve the targets in the plan, there are still DRRM plans and procedures in some local government units (LGUs) that do not tap into and maximize this resource. In addition, even if recognition is accorded to the value of local knowledge in DRRM by some LGUs, the process of integrating local knowledge with scientific information in DRRM to further disaster resilience still needs more attention. This is due to the fact that the amalgamation of local knowledge with scientific information only transpires at a particular or personal level, and not in official settings where it involves planning and making decisions by LGUs and other stakeholders.

Conceptual Framework

Gaillard and Mercer's road map proposes that DRR should not be exclusive, but rather inclusive. They define the word "inclusive" as 1) acknowledging that diverse types of knowledge are important in the face of tackling DRR, 2) that both top-down and bottom-up initiatives are equally essential in reducing disaster risk in a sustainable way, and 3) that both the aforementioned statements necessitate the collaboration of various sectors and other stakeholders across different levels.

Figure 1. Road map for integrating knowledge, actions and stakeholders for disaster risk reduction (Gaillard and Mercer, 2012)



6. Molina, J., 2015. Integration of Indigenous Knowledge into Disaster Risk Reduction and Management (DRRM) Policies for Sustainable Development: The Case of the Agta in Casiguran, Philippines. M.A. University of Auckland.

7. National Disaster Risk Reduction and Management Council (NDRRMC), 2011. National Disaster Risk Reduction and Management Plan (NDRRMP) 2011-2028 [pdf], p. 8. Available at: <http://www.who.int/hac/crises/phl/philippines_ndrrmp_2011_2028.pdf> [Accessed 10 November 2017].

The road map stresses a process that is horizontal towards an integrated DRR. It starts with an integrated evaluation of disaster risk according to the two types of knowledge forms, specifically scientific and local, then the organization of a multi-stakeholder dialogue regarding the problems of the community and the resolutions for these, and lastly, the actions that unite the initiatives from the top-down and bottom-up.

Integration of Local and Scientific Knowledge

The scientific community have long rejected local knowledge for being subordinate and irrelevant as compared to scientific knowledge which is formally improved and validated by the scientific community. Knowledge that is created locally is typically implanted in a community with no identification. Even though scientific knowledge is a manifestation of the place from where it materializes, it ultimately becomes certified and supported worldwide. Conversely, local knowledge constantly adapts through the resourcefulness and inventiveness of the local community, and interaction with external structures and information. This gap between scientific and local knowledge, particularly with their characteristics, further pulls them apart within the spectrum of knowledge. However, local knowledge is being acknowledged for its influence on development, with several people claiming that the acknowledgement and integration of local knowledge can help in making development strategies more effective. Nonetheless, given the widespread and augmented connection and globalization worldwide, local knowledge may be not be practical anymore or some types of local knowledge might even aggravate susceptibility to disaster risk. Therefore, it is imperative that local knowledge be evaluated critically so as to guarantee its relevance and efficiency in addressing disaster risk. In contemporary times, local knowledge is being given attention for its relevance in DRR. This reality manifests the shift of focus from the top-down and technocratic approaches applied in DRR to a more localized or context specific approach. Even though science and the knowledge that goes with it is recognized in DRR for saving lives, local knowledge has also been accepted for its capacity to do the same. One case in point was the 2004 Indian Ocean tsunami which hit and affected numerous populations. However, more often than not, scientific and local knowledge are isolated from one another in the practice of DRR. Moreover, it should not be expected that either of the two forms of knowledge in isolation will solve challenges in development within vulnerable populations. Therefore, there is a need to settle and merge both scientific and local knowledge in order to bridge the gap. This means that scientific knowledge can be adapted and adjusted according to local knowledge and practices with the purpose of developing strategies for DRR. Hence, it is important that both the scientific community, including the decision-makers in the political scene, and the local community unite in working for DRR. In doing this, local knowledge and practices must be incorporated with existing scientific knowledge and technology for it to be context-specific[8].

Top-down and Bottom-up Initiatives

The frameworks for top-down and bottom-up approaches are distinguished as conflicting and opposing policies in DRR, as well as in environmental and development management. Most of the time, the policies and actions in DRR are formulated and designed consistent with command-and-control and technocratic strategies which involve structures for engineering to mitigate hazards, warning systems which are technology-based, and one-sided risk awareness campaigns. Frameworks for a top-down approach are dependent on transmission of knowledge that initiates from the top. However, the existing top-down procedures remained futile in preventing disasters from happening. As a result, practitioners and several social scientists recommended a framework that is a bottom-up approach for DRR. One such framework is the CBDRR which advances and promotes the involvement of highly vulnerable populations in evaluating their own risks and the means to reduce it. Furthermore, the vulnerable communities are empowered, and their local resources are given importance in the practice of CBDRR. The understanding of the dichotomy between the top-down and bottom-up approaches is vital in recognizing that both frameworks will not be effective in DRR when applied in isolation from one another. Hence, both bottom-up and top-down initiatives must be combined in the practice of DRR. Strengthening the capability of people to confront natural hazards requires the reduction of their vulnerability, which is done through the intervention from those who are at the top. It also requires the reinforcement of their capacities, which is done through the actions from those who are at the bottom. Typically, the vulnerability of people, in the face of natural hazards, are caused by structural forces which originate from outside the local community. Such structural forces include uneven access and distribution of resources, discrimination based on ethnicity, and weak governance. It is therefore the responsibility of those who hold power and respected positions to address and confront these structural constrictions which increase the vulnerability of local communities[9].

8. Gaillard, JC, and Mercer, J., 2012. From knowledge to action: Bridging gaps in disaster risk reduction. Progress in Human Geography, 37(1), pp. 93-114.
9. Ibid., pp.97-98.

Dialogue between the Outside Actors and Inside Actors

The integration of different forms of knowledge and actions in the practice of DRR only becomes possible when all the stakeholders participate and interact in the process. Therefore, the stakeholders involved should include the local community itself up until the national level. This is done so that the vulnerability of the affected communities can be reduced and their capacities to be improved at the same in time when facing natural hazards[10].

Methodology

The research study considered the planning process, policy formulation, and implementation of the current LDRRMP, as well as the coordination among the local government officials and other stakeholders involved in DRR in Porac, Pampanga. Initially, the plan was to conduct a focus group discussion (FGD) with a selected sample from the Aeta community and key informant interviews (KIIs) with local government officials. Eventually, the method for data collection became limited to KIIs as a result of the deliberate decision made by the researcher in accordance with the advice of the National Commission on Indigenous Peoples (NCIP) Regional Director of Region III[11]. However, this decision did not adversely affect the interpretation of the findings and an alternative action[12] was done to still acquire primary data on some of the local knowledge of the Aetas in disaster risk reduction.

KIIs with four local government officials and desk review were conducted to acquire primary and secondary data on the DRRM policies, procedures, programs, and activities of Porac. A nonprobability sampling method was used, specifically purposive sampling, since the data needed would come from key government officials who have experience and expertise on the LDRRMP. The KIIs included the DRRM Officer, DILG Officer, DILG Administrative Assistant, and the Barangay Captain of Camias. Face-to-face and semi-structured interviews with open-ended questions were conducted. Audio recording and note-taking were utilized in collecting the data, once the verbal consent of the participants was acquired. Participants were fully aware that the interview would be audio recorded and the participants' right to privacy was respected given that the acquired data were not disseminated by the researcher. Primary written documents such as the LDRRMP for 2018 of the DRRMO and other excel files were collected from the DRRM Officer through Google mail in the last day of fieldwork.

The guide questions for the interview were based on Gaillard and Mercer's road map, which helped in the thematic analysis used for addressing the research question. This road map that illustrates the relations of different factors towards an integrated DRR was deemed appropriate to the research study and in answering the research question since it takes into consideration all the necessary factors involved in an integrated DRR, including local knowledge, that promotes an inclusive and community-based DRR for disaster resilience, especially among the marginalized and vulnerable sectors.

Data Presentation and Analyses

The following analyses rely on the results of the desk review and key informant interviews conducted with the Disaster Risk Reduction and Management Officer (DRRMO), Department of Interior and Local Government (DILG) Officer, DILG Administrative Assistant, and the Barangay Captain of Camias who are all under the DRRM Council of Porac. The interview guides used for the KIIs were intended to determine the planning, policy formulation, and implementation processes of the DRRM Council of Porac, and the subsequent cooperation mechanisms and initiatives of the involved government agencies, Civil Society Organizations (CSOs), Non-Government Organizations (NGOs), volunteers, and local community. The interview guides were designed based on the road map of Gaillard and Mercer with the research question and objectives in mind. Thus, the following analyses would be limited to the thematic analysis provided for by the road map.

10. Ibid., pp. 98-99.
11. The researcher visited the NCIP Regional Office in San Fernando, Pampanga on February 21, 2018. The agenda was to personally submit the thesis proposal and acquire the permission of the NCIP Regional Director to conduct FGDs with the Aeta community in Porac, Pampanga. The researcher had a consultation with the Regional Director about the thesis proposal. After explaining the nature and objectives of the research study, the Regional Director advised the researcher to either reconsider her chosen community or method of data collection since it might cause a delay and financial burden on her part as a graduating student. Hence, the researcher opted to conduct KIIs with local government officials instead.
12. The researcher was able to interview the Barangay Captain of Camias belonging to the sector of the Aetas.

Thematic Analysis

The themes used and examined are organized according to the Road Map for the Integration of Knowledge, Actions, and Stakeholders for an Integrated Disaster Risk Reduction. This road map was used to facilitate the critical analysis on the integration of the Aeta community including their local knowledge, context, and actions in the DRRM Plan of Porac, Pampanga for the term 2017-2018. The findings of the research study were analysed in conjunction with the explanations and viewpoints of each component of the road map.

I. RISK ASSESSMENT

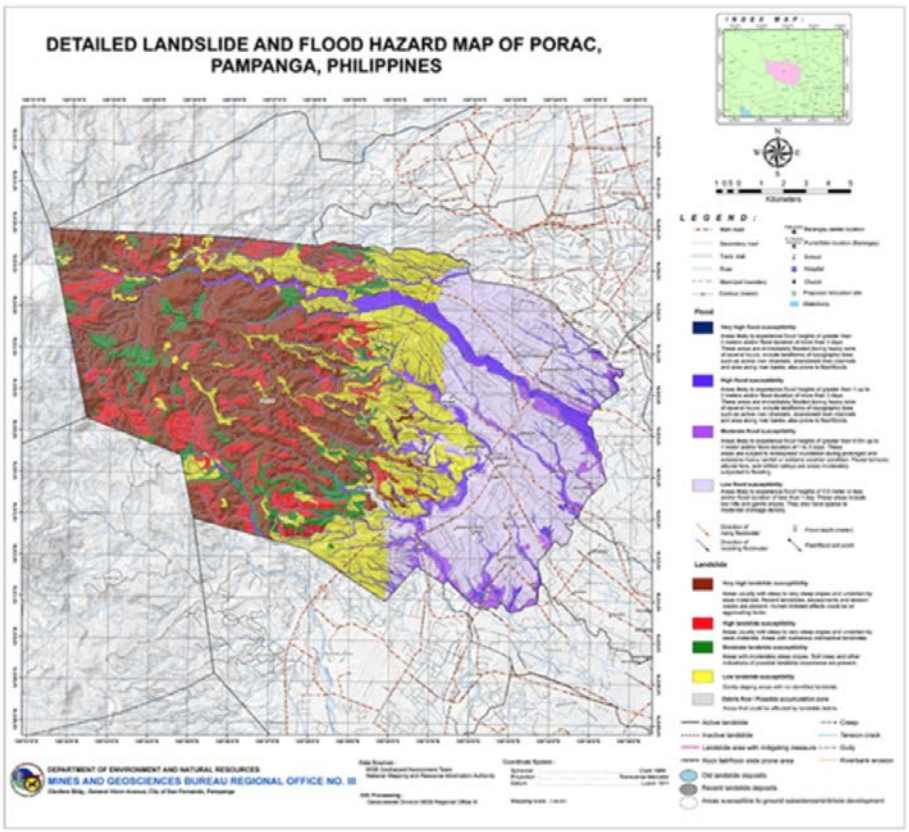
A. Scientific Knowledge

The following data and information for scientific knowledge are mainly based on the Local DRRM Plan for 2018 of the DRRM Council of Porac, Pampanga. The researcher acquired the plan from the DRRM Officer himself through Google mail. The plan is currently being finished so there are parts in the plan which are still incomplete and being formulated.

Geohazard Assessment[13]

The geohazard maps below were created and provided by the geologists from the Mines and Geosciences Bureau-Regional Office III (MGB-R3). The data were sourced from the MGB Geohazard Assessment Team and the National Mapping and Resource Information Authority, while the GIS Processing was done by the Geosciences Division MGB Regional Office III. In their geohazard mapping program, they organized a geohazard assessment of Pampanga, including the barangays in the municipalities and cities of the province. They classified each barangay consistent with their susceptibility to flooding and landslide.

Figure 2. Landslide and Flood Hazard Map of Porac, Pampanga



13. Mines and Geosciences Bureau Regional Office No. III, 2006. Results of the MGB Geohazard Assessment Covering 22 Municipalities in the Province of Pampanga. [pdf] Available at: <http://region3.mgb.gov.ph/mgb_rolII_files/pdf/Geohazard_Assessment_Map/pampanga_exec-summary.pdf> [Accessed 9 April 2018].

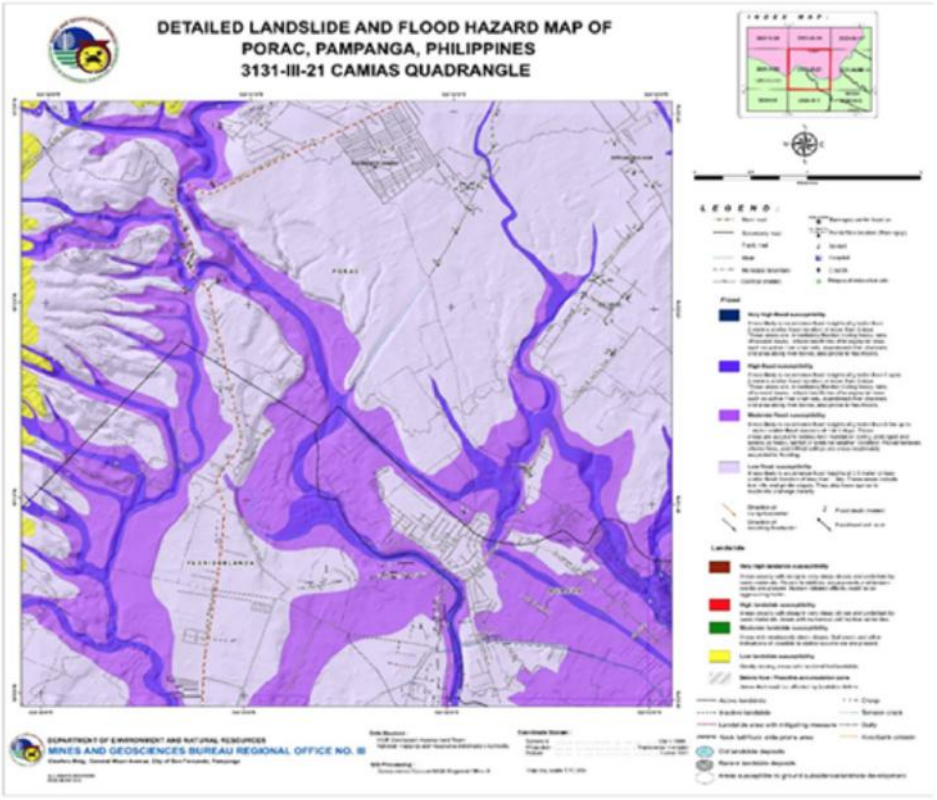
Landslide

Regarding landslide susceptibility, the areas in the barangays evaluated are those situated and/or close to slopes and riversides because these areas are susceptible to the incidence of a landslide. Each barangay was given a rating in reference to the barangay proper given that most of the population reside there. However, it is important to note that the sitios are not reflected in the rating. To inform them of their susceptibility to landslides, the barangays were offered a Landslide Threat Advisory, supplemented by recommendations specific to the barangay.

Flood

There was also an assessment of the susceptibility to flood of the barangays in the municipality. The barangays situated in low portions detected in the area, in areas which are topographically low-lying, and/or close to a river system, are those categorized with moderate to high susceptibility to flooding. In order to inform them of their susceptibility to flooding, the barangays were given a Geohazard Threat Advisory, complemented by recommendations certain to the barangay.

Figure 3. Landslide and Flood Hazard Map of the Camias Quadrangle



As it is illustrated in the detailed landslide and flood hazard maps shown above, majority of the barangays either have a very high susceptibility to landslide or low susceptibility to flood. Based on the assessment of MGB-R3, nearly all of the barangays in Porac have low flood susceptibility. This is due to the fact that the municipality has a higher elevation given its topographical location. Twenty-four out of twenty-nine barangays in the municipality have a low susceptibility to flooding. The poor drainage system is typically the cause of flooding. Two of the five upland barangays, namely Diaz and Sapang Uwak, are included in the 24 barangays susceptible to flooding with a low rating parameter. Similarly, Villa Maria, which is an upland barangay as well, is moderately to highly susceptible to flooding. It has areas which are naturally low-lying, and sections close to active streams and river channel, giving it a high susceptibility to flooding. Additionally, two of the upland barangays, namely Inararo and Camias, have high flood susceptibility, particularly in areas close to the creek or river. Beside the river channels, river bank erosion and channel widening are active. These river channels are the Gumain River and Telakawa Creek. Generally, the active streams and waterways, and main natural channels navigating the municipality are prone to riverbank erosion and siltation. Hence, all the upland barangays where the Aetas reside are susceptible to flooding.

5 Barangays of the Aeta Community

The five upland barangays where the Aeta community can be found in Porac are Camias, Diaz, Inararo, Sapang Uwak, and Villa Maria. These barangays are the only ones considered since the research study focuses on the context of the Aeta community in Porac, Pampanga. Based on the table shown below, all 5 of the upland barangays are highly susceptible to rain-induced landslide as a result of heavy rains.

Table 1. Upland barangays and their hazard classification

BARANGAY	IDENTIFIED HAZARD	HAZARD LEVEL	CAUSES OF HAZARD
Camias	Rain-induced landslide	HIGH	HEAVY RAINS
Diaz	Rain-induced landslide	HIGH	HEAVY RAINS
Inararo	Rain-induced landslide	HIGH	HEAVY RAINS
Sapang Uwak	Rain-induced landslide	HIGH	HEAVY RAINS
Villa Maria	Rain-induced landslide	HIGH	HEAVY RAINS

Analysis

All the information presented regarding the hazard risks of the municipality come from the authority figures or those who hold positions in the government and who are experts on the field. The data and information provided are heavily scientific-based which do not integrate any local knowledge. Furthermore, it is important to note that the sitios are not reflected in the rating for landslide. Hence, it is evident that no consultation and collaboration with the Aetas were done while producing the flood and landslide hazard maps. The main problem here rests on the fact that there is no exchange of information such that the transmission of knowledge is one-sided. This is not to say that it is wrong, just that maybe it can be disseminated through the means by which the local people transmit or disseminate their local knowledge for sustainability and better acceptance by the people of the scientific information about their hazards and risks. The scientific information can be improved further when integrated with the local knowledge and context of the people, such that their risks, vulnerabilities, and capabilities are considered in all aspects.

B. Local Knowledge

For this component in the road map, I had the chance to interview the Barangay Captain of Camias who is Ma'am Gemma S. Danan, and the DRRM Officer regarding the local knowledge of the Aetas in times of calamity and potential disaster. Ma'am Gemma S. Danan was only elected last February 5 this year and was the one who succeeded the IPMR in that position. The results of the KIIs conducted are categorized according to the 4 thematic areas of DRR and the types of local knowledge. For operational reasons, a simple typology is used which organizes local knowledge into four types. The four types of local knowledge are based on Dekens' literature review of local knowledge[14].

14. Dekens, J., 2007. Local knowledge for disaster preparedness: A literature review. [e-book]. Kathmandu, Nepal: International Centre for Integrated Mountain Development (ICIMOD). Available at: <http://www.ndma.gov.pk/Publications/Local%20Knowledge%20for%20Disaster%20Preparedness%20a%20Literature%20Review.pdf> [Accessed 19 September 2017].

Thematic Area 1: Prevention and Mitigation

For prevention and mitigation, the ecological type of local knowledge pertains to the livelihood of the Aetas, particularly in the field of agriculture. This serves as a form of mitigation and prevention since it is through the practice of agriculture that the Aetas get to take care of the natural resources through their knowledge of the environment such as soil classification and climate patterns. It is also through the practice of agriculture that the Aetas preserve the diversity of the ecosystem.

The main source of livelihood of the Aetas is agriculture, and this livelihood can be a form of capacity in the face of disasters. The common crops they plant include ampalaya, gabi, banana, ube, sitaw, corn. They plant different crops based on the seasons. The corn and bitter gourd (ampalaya) are some of the crops that sell the most since they only grow within 3 months. Additionally, the string beans (sitaw) are harvested seven times in one month. This practice helps them sustain their needs especially when the rainy seasons comes. During dry season, it becomes more difficult for the Aetas to plant and harvest. As an alternative, they harvest the bananas they planted a year before which they get by walking at a distance of 3 kilometers, that is if they cannot pay for the 300-peso fare just to transport the bananas.

As for the sociocultural type of local knowledge, the key informant also mentioned that one of the initiatives of the Aeta community is to clean the roads and the schools. Through this practice, the amount of trash is minimized and therefore, the probability of clogging the drainage is lessened, which helps in the prevention of flood. Furthermore, there are some Aetas who do contractual work during the dry season, when they have nothing to harvest. This coping mechanism mitigates the impact of droughts which affect the main source of livelihood of the Aetas. Nonetheless, the MDRRMO helps the Aetas in terms of their livelihood by providing them with seedlings to plant such as monggo. The MDRRMO does this every year to support and sustain the livelihood of the Aetas. Through this assistance, it is evident that the LDRRMP is responsive to the needs of the Aetas and that part of their local knowledge is reflected in the plan.

For the knowledge about development projects which pertain to the intervention of the local government, the Aetas who reside on the mountains are advised to stay in the barangay whenever there is an impending typhoon. This is because they are prone to landslides and live far from the barangay. As a form of mitigation, the barangay advises them to go to the barangay hall to stay there. Once the typhoon ends, the Aetas go back to the uplands and plant their crops.

Thematic Area 2: Preparedness

The resources they use in preparation for a disaster include plates (plato), scoop (sandok), bucket (timba), and pots (kaldero) which they use to store water and food. This form of preparation is practiced at the household level.

The DRRM Officer mentioned in the interview the common practices of the Aetas during the wet and dry seasons. Once the rainy season starts, the Aetas stay in their house. When the Aetas know that there is a coming hazard, the tribes find food for themselves to store. They store all the food available for when they run out of food supplies. Most often than not, the food comes from their own harvest. They call their plot of land where they harvest their food kahinin. When the dry season comes, that is when the Aetas go out of their houses to plant and harvest.

For the sociocultural type of local knowledge in preparedness, the Aetas directly contact the barangay to ask for information regarding the impending hazard and for any assistance that they need. The barangay is said to be always ready before a hazard hits. This practice shows the social relations between the Aetas and the LGU.

When asked about the perceptions and understanding of the Aetas on disasters, the Barangay Captain of Camias answered, without any pause, that they are given trainings for different hazards such as landslide. Involved in the trainings are the staff and Aeta families. They conduct the trainings in the barangay. This answer does not actually give an answer to the question regarding the perception or understanding of disasters and beliefs of the Aeta community. However, the answer gives the implication that there is a fusion of the knowledge of the Aetas and the scientific knowledge which they acquire from the trainings. Conversely, the answer indicates the probability that the Aetas in Porac no longer have their own field of perception on disasters as a result of the intervention by the LGU. Nonetheless, this cannot be verified unless the question is answered by the Aetas themselves. Additionally, some of the Aetas do not attend the trainings because of immediate concerns such as the need to plant crops for their food given that they easily run out. The barangay then only selects those who are more prone to hazards. Nonetheless, those who were not able to attend are asked again to attend other dates for the training.

Thematic Area 3: Response

For disaster response, the only type of local knowledge obtained falls under the sociocultural type of knowledge, considering that it demonstrates the social relation between the Aetas and the LGU. During a calamity, the Barangay Captain instructs the Barangay Tanod to evacuate the affected people in evacuation sites such as the schools and Day care Center, especially when the typhoon strikes violently. During these times, they prioritize those who live in dangerous areas. Whenever there is a calamity, they immediately report it to the Municipal Hall of Porac and inform them about the damages and the tribes affected. In essence, it is a protocol that did not originate from the Aetas and their culture, but which they have learned or acquired from the LGU and was eventually incorporated in their practices.

Thematic Area 4: Rehabilitation and Recovery

For this thematic area, the barangay provides them with places to sleep and rest in, and other physical necessities they need to recover. This type of knowledge falls under the knowledge about development projects since it is a form of intervention by the LGU. However, more research is necessary to know the Aetas' belief and response to this specific intervention. Furthermore, this data does not provide any information on how the Aetas rehabilitate and recover on their own.

Analysis

Even though the local knowledge gathered is not that extensive since it was sourced from only one Aeta who is the Barangay Captain of Camias, the consideration of the local knowledge by the LGU could still be assessed based on the activities and protocols exercised by both parties together. For one, it is evident that the LGU gives due importance to the livelihood of the Aetas as a form of capacity in facing disasters. That is why the LGU provides the Aetas with seedlings every year to support and sustain their main source of livelihood. In addition to this, the DRRM Officer himself knows the practices of the Aetas during the wet and dry seasons. However, the fact still remains that the trainings provided for various hazards are one-sided such that the Aetas' knowledge and practices are not taken into account in organizing the trainings. Nonetheless, the DRRM Officer mentioned during the interview that the DRRM Council of Porac does not only consider the information provided by the MGB. For instance, when an area is labelled as safe by the MGB, but the history of calamities and what the locals experience indicates otherwise, then the Barangay Disaster Risk Reduction and Management Committee (BDRRMC) and DRRM Council incorporate the information coming from the locals in the DRRM Plan of the municipality.

II. DIALOGUE

A. Outside Actors (e.g. LGUs, government agencies, NGOs, scientists)

The Municipal Disaster Risk Reduction and Management Council (MDRRMC) of the LGU of Porac is organized in agreement to Republic Act 10121.

Organizational Structure

The composition and organization of the MDRRMC of Porac, in pursuance to RA 10121, is composed of the following:

Chairman: Hon. Condralito B. Dela Cruz (Municipal Mayor)
Engineer: Engr. Glenn I. Lansangan (MPDC & PIC-Municipal)
Local Disaster Risk Reduction and Management Officer: Francis S. Caligagan

Members:

Jhoanne M. Arcega, MSWDO
Lilia M. Panlilio, M.D., Municipal Health Officer
Edgar Cornelio Lacanlale, M.D., Rural Health Physician
Neil G. San Andres, M.D., Rural Health Physician
Melba T. Malit, Municipal Agriculturist
Ma. Luisa I. Gomez, Municipal Budget Officer
Marites C. Miranda, MLGOO
Chief PNP Porac
Chief Bureau of Fire

District

Abelardo I. Garcia, DepEd District Supervisor, East
Bernadette C. Tiongco, DepEd District Supervisor, West

Representatives

Ronie C. Mercado, LnB President, Porac Chapter
Felixberto Gomez, Private Sector Representative
Representative, Tau Gamma Phi Porac Chapter
Fernando David, Porac Ministerial Fellowship

B. Inside Actors **(local communities including marginalized groups)**

List of Accredited CSOs/POs

1. Federation of Porac Fish Pond Operators
2. Kapampangan Manalakaran Incorporated
3. National Moral Recovery Officers Foundation, Inc.
4. Porac Sugar Planters Association
5. Taguete-Pulung Maba Urban Poor Association of Brgy. Sta. Cruz
6. Kabalikat Civicom (494 Porac Chapter)
7. Porac Multi-Purpose Cooperative
8. Kaka Asosasyon ng Inararo
9. Jalungians Buklud Lugud Inc.
10. Moral Recovery & Chaplaincy Organizational Movement
11. Ayta Matubag Tribes Inc.
12. Porac Ministerial Fellowship
13. Porac Ministerial Fellowship
14. Persons with Disabilities
15. Senior Citizens Affairs
16. MPTODA
17. Parish Pastoral Council
18. Rural Improvement Club
19. Municipal Agricultural & Fishery Council

Analysis

The list of accredited CSOs and POs enumerated above was given by one of the DILG Administrative Staff, who is Mr. Ralph Reyes. In three of the KIIs conducted, the Ayta Matubag Tribes, Inc. was mentioned as the CSO specifically organized for the Aeta community. The ones included in the list are those who have a stake in the field of DRR in relation to addressing the needs of the community.

For the dialogue component of the road map, it can be assessed based on the interviews conducted with the government officials, that the LGU is open to hearing the concerns of the Aeta community. Furthermore, the DRRM Officer mentioned that the Aetas and their representatives are included in the coordination with all stakeholders and various sectors involved in DRR. Hence, the relationship between the Aeta community and the LGU is being continuously developed as more programs and activities are being conducted with the local community.

III. ACTION

The top-down initiatives of the Local Disaster Risk Reduction and Management Council (LDRRMC) of Porac, and bottom-up initiatives of the local community were acquired through primary and secondary data collection. A desk review and key informant interviews were conducted to verify the procedures and activities of the DRRM Council and the involvement of other stakeholders such as CSOs, NGOs, volunteers, and the Aeta community in disaster risk reduction. Since no focus group discussion was conducted with average Aeta residents, the data provided for the bottom-up initiatives come from the side and perspective of those who are in charge of the top-down initiatives, who are the local government officials from the DRRM Council. Nonetheless, this does not automatically mean that the data is erroneous since an initiative, whether coming from the top or bottom involves both sides; it just means that the data presented regarding the initiatives from the bottom-up are limited to the knowledge and experiences of those who hold positions in the LGU.

A. Top-down Initiatives

Planning Process

According to the DRRM Officer, who is Mr. Francis S. Caligagan, for the planning process, they take into consideration and incorporate the various sectors in their plan. Such sectors involve government agencies and the CSOs of the local community. The incorporation of all sectors involved in the practice of DRR in the municipality is essential since each sector has a role to play when it comes to facing natural hazards and addressing disasters. For example, the local community which includes the CSOs, People's Organizations (POs), Volunteers Committee, and Indigenous Peoples Mandatory Representative (IPMR), are responsible for the information dissemination activities. In this process, the integration of the Aetas, by means of representation, is strong since the IPMR is appointed a position in the Local Disaster Risk Reduction and Management Council. Hence, through the IPMR, the Aeta community is given representation in the local legislative functions.

Policy Formulation

In formulating the policies, the DRRM Council of the municipality takes into consideration the hazards of the Area of Responsibility. This means that the objectives, activities, and outcomes for each of the thematic area are dependent on the hazard profile of the community. The common hazards mentioned are rain-induced landslide, strong winds, and flash floods. The affected areas include both the upland and lowland barangays.

Implementation Mechanisms

For the implementation of the plan, they disseminate all the necessary information, mainly about the disaster preparedness activities and preparations needed when a calamity strikes. They do this through an Information, Education, and Communication (IEC) Campaign which they conduct using social media accounts and through lectures in schools. This year, they are planning to do this in the barangay level. Furthermore, they manage the necessary arrangement and resources needed to implement the activities in the plan. For example, if for the quarter they need to conduct trainings, they will search for trainers and facilitators and make a project proposal. Another example is the trimming of trees as a preparation for disaster. The barangays, together with the Municipal Disaster Risk Reduction and Management Office (MDRRMO), conduct this activity. Prior to that, they ask the DENR for a permit to trim the trees. It is important to note that the Aetas help in the trimming of trees and in forest management as well. This means that they are given the opportunity to participate in the implementation activities.

Disaster Prevention & Mitigation

1. Capacity Building

Through the sponsorship by the Provincial Disaster Risk Reduction and Management Office (PDRRMO) of Pampanga in association with the Office of Civil Defense (OCD) and Department of Interior and Local Government (DILG), the MDRRMC, together with the selected members of the Porac Quick Response Team (QRT), undertake various trainings for capacity building. The following are the trainings conducted:

- Formulation of DRRM Plan and Contingency Plan
- Basic Life Support with First Aid
- Training on Water Search and Rescue
- Seminar/Workshop on Risk Assessment and Vulnerability/Hazard Mapping
- Formulation of LCCAP
- Operation LISTO
- Emergency Machinery Extrication & Stabilization Crash Course
- Orientation/Briefing on R.A. 10121

2. Flood Mitigation Structures

In order to minimize flooding, interventions such as building structures were built in the municipality like the Mega Dike, Traverse Dike, Spillway, CHB lined canals in various barangays.

Disaster Preparedness

1. Disaster awareness & preparedness activities

The MDRRMO prepares the schools and other institutions as well by organizing emergency drills in coordination with the Bureau of Fire Protection (BFP) and Philippine National Police (PNP). This year, the MDRRMO is planning to expand further by tapping the community, specifically the barangays.

There was one NGO mentioned by the DRRM Officer that conducted Disaster Preparedness Awareness Campaign from the upland where the Aetas reside. This happened last year in the month of August. The Purok Leader served as the representative of the Aeta community. In this activity, the representative of the Aetas is given the responsibility to facilitate the campaign and thus, the integration by means of participation and representation is strong.

Moreover, they conduct Simultaneous Earthquake Drills quarterly. Large establishments are targeted for this such as schools. The Office of Civil Defense (OCD) gives the MDRRMO a letter regarding the National Simultaneous Earthquake Drill and they do this together with the Department of Education (DepEd). Along with this, they also distribute leaflets to the barangays and schools, in coordination with the province of Pampanga. The leaflets contain information on the preparations needed prior a typhoon. Furthermore, the MDRRMO requires the people to have their Go Bag, which contains a first aid kit, non-perishable goods, and other important commodities.

The DILG Officer who is also known as the Municipal Local Government Operations Officer (MLGOO) provided information on the overall role of the DILG in disaster preparedness and the specific standard procedures they conduct in coordination with other agencies and the municipal barangays. The key informant, Ma'am Marites C. Miranda, mentioned that the DILG's main role is the supervision of the LGUs. In doing this, they require the barangays to submit a disaster plan, whether every 3 years or yearly. Prior to that, they conduct seminars for Disaster Preparedness and Community-Based Disaster Risk Management Plan with the barangays, including the 5 upland barangays of the Aetas. In this seminar, the MDRRMO handles the activities and the DSWD also goes to the upland barangays to teach.

When there is an advisory coming from the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), the DILG sends a text message to the MDRRMO and the barangays, specifically to the Punong Barangays, to activate their Operations Center when there is an impending typhoon. The BDRRMC should be in the barangay when that happens. Basically, the DILG initiates and facilitates the dissemination of an advisory from PAGASA to the barangays and the whole municipality when there is a coming typhoon. They also conduct emergency meetings with the MDRRMO whenever the situation requires it. Additionally, the Indigenous Peoples Mandatory Representative (IPMR) of the Aetas is also in contact with the DILG in times of need. For instance, when the Aetas cannot go out and buy food because the roads get destroyed, the IPMR contacts the DILG. The Municipality then sends them food via truck. It is evident in this procedure that the Aetas are being consulted on their needs and that the DRRMC is responsive to those needs. Therefore, through the IPMR, the Aetas are accorded not only the appropriate representation, but also participation.

2. Early Warning System Procedure

For an immediate response to any emergency situation, the MDRRMC convenes and coordinates with the appropriate offices and BDRRMC. Subsequently, the affected barangay shall warn and notify the community of the impending hazard and take all the necessary precautionary measures such as instituting a local alert system using the accessible early warning devices. The people living in Porac, Pampanga use the following early warning devices: siren, whistles, megaphones, and church bells. The details of usage of the warning devices were not specified such as information on which device is used for which hazard, and the varying signals in terms of the level of intensity.

The advisory comes from the PAGASA and the DILG informs all the Barangay Captains about the impending hazard. In cases that the suspension of schools in Porac is not announced in television, but the Mayor thinks that there is a need to postpone classes, the MDRRMO texts the schools, particularly the District Supervisors and Principals to inform them about the suspension.

Based on the procedure, there is a collaboration between the MDRRMC and barangay officials who are considered as representatives of the local community. Hence, the practice of Community-Based Disaster Risk Reduction is being adopted. This procedure manifests the concerted effort and action among most, if not all, of the stakeholders involved and the integration of the local community through the participation of the barangay officials in the convention.

This is a sign of progress for the LGU of Porac, however, it still has a long way to go in terms of expanding the reach and involvement of the local community, especially the vulnerable and minor sectors, in the assessment of their own risks, which include their hazards, capacities, vulnerability, and resilience and the means to lessen it.

3. Communication and Information Relay System

Porac's LGU, through the MDRRMC, shall notify and inform all the barangays concerned of any incoming possible natural hazards through the following methods of communication:

- Primary
  - SMS
  - UHF/DHF Radio
  - Telephone (landline, cell phone)
- Secondary
  - Media (TC, Radio)
  - Social Networking sites

4. Disaster Monitoring and Reporting System

For every major river system, there are monitoring outposts established. It is also stated in the plan that it is mandatory that high risk barangays and areas affected shall be regularly monitored and reported.

a. Infrastructure: Monitoring of Critical Structures and Waterways

The Municipal Engineer starts the inspection and monitoring of critical infrastructures with the help of the barangay officials during disasters.

Disaster Response

In times when natural hazards strike the upland barangays where the Aeta community can be found, the MDRRMO contacts the Barangay Captains, and asks them about the situation of their areas and their needs. During the interview, the DRRM Officer mentioned that the Aetas have the attitude of asking for help even if the rain is not that dangerous since they got used to receiving relief aid. He said,

"We contact the Barangay Captains to ask them about the situation of their area, and their needs. However, they have an attitude of asking for help and relief even if the rain is just minimal. But, the rain does not have that much impact on them. Anyway, those are their hazards."

They also provide transportation in cases when the local community needs to be evacuated when there are landslides. They ask the affected community if there are injuries, how many people died, and the extent of damage on properties.

1. Emergency Operations

During emergency operations, the members of MDRRMC and Porac Quick Response Team extend assistance and services in order to facilitate crucial functions within the Operation Center.

2. Rescuer Deployment System

For this system, the municipality established its own Emergency Support Team. They manage the pre-positioning of resources to strategic zones and utilize the Incident Command System (ICS) principle when applicable.

3. Evacuation System

a. Pre-Emptive Evacuation

The authority instructs the BDRRMC to accurately inform the communities positioned in vulnerable areas about the impending hazard, and to convince them to evacuate to securer grounds. Afterwards, the MDRRMC initiates the activation of pre-identified evacuation centres.

b. Forced Evacuation

In order to guarantee zero casualties in times of direct threat to life of vulnerable individuals and families, a forced evacuation is imposed. As a recourse when an emergency has been announced and the risk of loss of lives is imminent, the municipality of Porac issued a Municipal Resolution No. 45, Series of 2017, implementing Sangguniang Panlalawigan of Pampanga Ordinance No. 605, also known as an Ordinance Prescribing the Guidelines on the Implementation of Pre-Emptive or Forced Evacuation.

c. Municipal Escape System

With the aim of relocating or evacuating families who are in danger, the MDRRMC established strategic areas. For those living in the upland barangays, the closest and securest adjacent barangay will be their point for pick-up, whereas the low-lying barangays will be vacated to their assigned evacuation centre.

4. Evacuation Management System

a. Evacuation Management Team

The operation of the evacuation centre shall be supervised and managed by the MDRRMC. The Municipal Social Welfare Development Office (MSWDO), Municipal Health Office (MHO), and Barangay Officials on Health & Sanitation and Women & Family are the members of the team who shall carry out the important actions and services expected. The PNP will be responsible for the maintenance of the security and safety of the area.

b. Evacuation Center Facilities

For the temporary evacuation centres, the LGU makes use of existing structures. The identified evacuation facilities are: Pio Model Community Covered Court, Jose Songco Lapid Sport and Civic Center, Manibaug Libutad Covered Court and the Sta Cruz Covered Court. The vulnerable sectors of the LGU are provided with their needs through the facilities and equipment the centre is equipped with. An extra portlet is offered when needed.

Disaster Recovery & Rehabilitation

1. Damage Assessment

It is the responsibility of the LGU Municipal Engineer to conduct site inspection and assessment of the damages. Damage report on infrastructures and estimated cost will be reported to the council and submitted to the PDRRMC.

Sector Management

1. Social Welfare and Development Sector

a. Stockpiling System

In preparation to every future relief and evacuation operations during situations of emergency, the MDRRMC and MSWDO are responsible for the stockpiling of essential food and commodities at the beginning of rainy seasons. For the procurement of goods and commodities during a disaster, a MOA is signed between the LGU and Dansa Mart.

b. System in the Identification of Affected Families

For the identification of target beneficiaries, the MSWDO created a reference system wherein they claim the cards of would be affected families in flood and landslide prone barangays and high-risk areas. After that, the Barangay Officials give the number of affected locals to the MDRRMC for insertion in the general list requiring assistance and interventions.

2. Health Sector

a. Stockpiling of Medicines

During calamities, the medicines supplied to patients or individuals are sourced from the regular stocks of the RHU. In order to ascertain the sufficiency of supplies, the additional budget for medicines come from the LDRRM Fund. as part of the disaster preparedness of the LGU, the Municipal Health Office (MHO) may ask for the procurement of medicines and other medical supplies.

b. Municipal Health Emergency Management System

The MHO conducts rapid health assessment and medical treatment to affected population. This consists of the Municipal Health Officer, Rural Health Physician, Public Dentist, Public Health Nurse, Rural Health Midwife, Sanitary Inspector, Municipal Nutrition Action Officer and Barangay Health Workers.

c. Health, Nutrition, Water & Sanitation Including Evacuation Center Management

The MHO takes the major role of protecting the individual as early as possible from the potential diseases outbreak in the evacuation centre. Vaccines and micronutrients supplementation is being provided among 0-5 years old. Provision of safe water supply and waste management system is strictly implemented.

d. Management of the Dead & Missing, Identification of Injured & Mass Grave

The responders take charge of the search and rescue of the dead and missing persons caused by disaster in close coordination with the NBI. Identification of dead person is requested from NBI to ensure proper identification with the service of a Forensic Expert, while the LGU takes the responsibility of the burial process.

e. Disease Surveillance and Reporting

Activation of Surveillance in Post Extreme Emergencies and Disaster (SPEED) is done by the RHU point person. PDSAR is also utilized as a tool in monitoring and reporting all communicable diseases. Detailed information and reports are recorded in the log book of the RHU.

f. Trauma/Mental Health or Psychosocial Services

Some RHU and MSWDO staff are trained in providing psychosocial services to disaster affected families. Both office extends the necessary psychosocial services and stress debriefing to affected individuals to help them bring back their right senses and disposition. However, there is still a need to capacitate the other LGU personnel on psychosocial therapy. Some cases handled which cannot be managed by the unit are referred to Regional Office III Mental Health Unit for proper management and treatment.

3. Agriculture and Veterinary

a. Monitoring System

In the assessment of damages as a result of any disaster, the Municipal Agriculture Office conducts field inspection and monitoring which involve the size of damaged farm lots and estimated cost of the damages per crop and livestock.

b. Reporting of Damages

For the process of recording damages, the DA technicians are responsible for the immediate reporting of the monitored extent of damage on agriculture. During a disaster, a partial reporting is made, and a final reporting comes after the disaster. The Damage Report is sent to the MDRRMC for incorporation into the Municipal Damage or Assessment Report, which is later submitted to the PDRRMC and other concerned agencies.

B. Bottom-up Initiatives

Indigenous Peoples Mandatory Representative (IPMR)

The local community itself, including the representatives, are part of the information dissemination activities for disaster preparedness. Such members of the local community include the IPMR or Indigenous Peoples Mandatory Representative, BDRRMC, Association of Barangay Captain Chairman (ABC), Volunteers Committee, CSOs, and POs. It is important to note that the IPMR of the Aeta community was only elected this year in the month of February. His name is Edwin L. Abuque. He currently works in the Sangguniang Bayan of the municipality and its office is in the Porac Municipal Hall[15]. Mr. Abuque's placement in the Sangguniang Bayan means that the IP sector in Porac is given representation. As the representative, he is tasked to raise the issues and concerns of the Aetas in the legislative level and to represent them in the issues and matters that affect the Aetas.

This means that the municipality is just only beginning or is at an early stage of integrating the Aeta community at the local government level wherein the IPMR is included in the decision-making process in DRR. However, based on the interview with Mr. Caligagan, the IPMR is responsible for the dissemination of information coming from the community to the administration. Thus, his participation at the local government level is limited to information dissemination. This is understandable considering the fact that he was just recently elected. In spite of this, the researcher thinks that there is still a lot of room for improvement in terms of the scope of work and responsibility of the IPMR that will ensure the complete participation of the Aetas and the consideration of the causes of their vulnerability, their capacities such as local knowledge, and their needs for better resilience in times of disaster.

The aforementioned data manifests the problematic nature of technocratic institutional frameworks from which our National Disaster Risk Reduction and Management Framework[16] is grounded on. It is stated in the NDRRMP that in accordance with the law or the R.A. 10121 in particular, the Office of Civil Defense (OCD) handles the formulation and implementation of the NDRRMP and makes sure that all the plans of the communities, provinces, municipalities, and cities are in line with the NDRRMP. One of the problems with this kind of framework, according to Gaillard[17], is that civil defense or military institutions are customarily hierarchical and perform best on a top-down military chain-of-command. Hence, in our case, the DRR policies are constructed at the national level and implemented by LGUs at lower levels, which are accountable for transmitting orders and actions from the top. Granted, this approach is effective in confronting big-scale disaster events, however, such kind of framework allots insufficient space for the integration of the local community, including their local knowledge and capacities, and makes it difficult to promote decision-making at the level of the local community. Such a framework also proves to be badly tailored for utilizing local knowledge and makes it hard to concentrate on the factors causing vulnerability.

15. The researcher was not able to meet Mr. Edwin L. Abuque, the IPMR of the municipality, on the last day that the researcher conducted her fieldwork. The researcher went to the DILG Office to ask if he was available for an interview. They were not sure so the DILG Officer, Ma'am Marites C. Miranda, gave the researcher his contact number instead. Afterwards, the researcher went to the Sangguniang Bayan office and the staff told her that he went on a trip to accompany his daughter who was sick at that time. The researcher texted him, but he didn't reply. As an alternative, the researcher interviewed the Barangay Captain of Camias who is also an Aeta.

16. National Disaster Risk Reduction and Management Council (NDRRMC), 2011. National Disaster Risk Reduction and Management Plan (NDRRMP) 2011-2028 [pdf], p. 8. Available at: <http://www.who.int/hac/crises/phl/philippines_ndrrmp_2011_2028.pdf> [Accessed 10 November 2017].

17. Gaillard, JC, and Mercer, J., 2012. From knowledge to action: Bridging gaps in disaster risk reduction. Progress in Human Geography, 37(1), pp. 93-114.

The researcher also asked the Barangay Captain of Camias who is an Aeta who succeeded Mr. Edwin L. Abuque as the Barangay Captain of Camias, about the other tasks of the IPMR, and she mentioned that the IPMR gets data about the barangay and from there, the IPMR sees a clear picture of the problems and needs of the community and on where he should focus on.

Barangay Disaster Risk Reduction and Management Plan (BDRRMP)

All the barangays of the municipality are required to submit their Community-Based Disaster Risk Management Plan to the DILG. They submit their disaster plans either every year or once every three years. Prior to the submission, the barangays attend a seminar facilitated by the DRRMO to support them in drafting their disaster plans. This initiative on the barangay level promotes the participation of the local community in the formulation of their own DRRM plan.

Based on the interview the researcher had with the DRRM Officer, the municipal DRRMC was able to talk to the Chairman of the BDRRMC last year about the things they need to do and work on together such as the hazard identification. Unfortunately, they have not discussed it together yet. However, they are planning to continue it this year.

In the KII with the DRRM Officer, the researcher asked the key informant on his opinion on the integration of the top-down and bottom-up approaches, and what he thinks about the idea. He agreed that it can be possible since even if it is the responsibility of the MDRRMO to know the hazards of the area, the local people know better the hazards of their area. The local people will then inform the LGU about the hazards and they can help in the formulation of the plan about the activities they need to do based on their situation, since the DRRM has some activities which are not applicable to the local context. Hence, he said that the people in the community themselves should help in the formulation of the plan. Afterwards, the researcher asked why there is a need to do that and the DRRM Officer replied,

“So that we will have more activities to do and the things we can do to help them. Also, each barangay has its own hazards, right? The hazards they will focus on depends on their area. Because like for example, in our open areas, there are strong winds, tornadoes, and along the rivers, there are flash floods. So, that is where they are vulnerable. In the uplands, they have their own approaches, so we also have plans for them.”

The people are aware of the hazards they face, especially here in the problacion and upland because we monitor the river. They know that if the river’s water gets high, we have a forced evacuation – pre-emptive evacuation; we transfer them in the evacuation centres. Those are our practices.”

Afterwards, the researcher explained that most of the time, the data and information contained in the DRRM Plan is based on scientific knowledge and not that context-specific. So, the key informant was asked about how the DRRM Council can actually acquire, document, validate, and integrate local knowledge in the DRRM Plan. The DRRM Officer then replied,

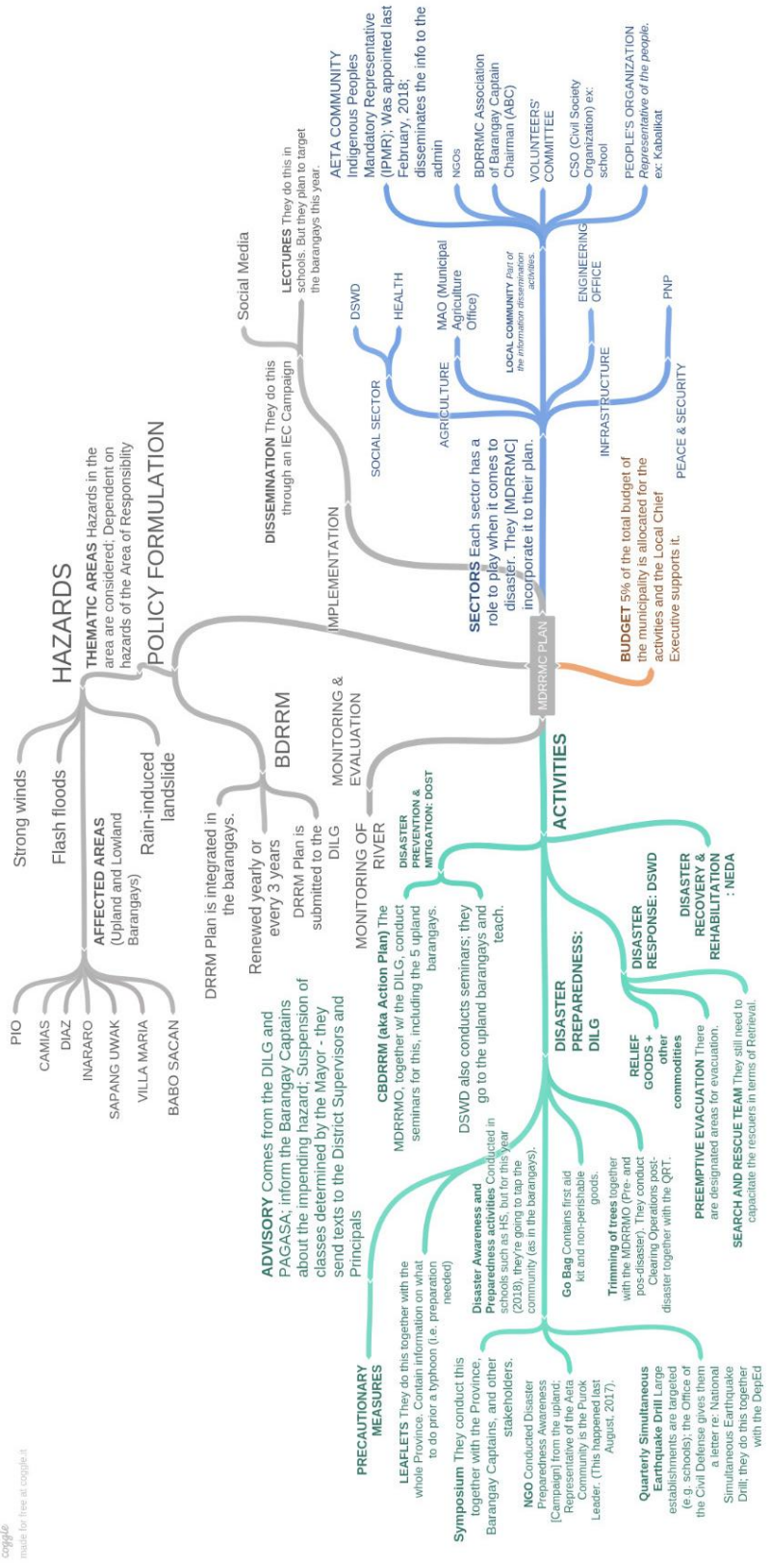
“The information we get comes from the MGB – but no. We also focus on their history of hazards. We also focus on that because for example, the MGB said that this area is safe, but based on what the locals reported, there is a landslide there, which the MGB did not say. So, through that, the BDRRMC puts their plans for the area. And then, the plan is incorporated in the DRRM Plan of the municipality.”

The explanation stated above reveals the integration of the local knowledge of the local community through the BDRRMC wherein they incorporate the input of the local people about their hazard. Eventually, this knowledge on the hazard experienced in the area is incorporated in the DRRM Plan of the municipality.

Furthermore, the DRRM Officer explained that oftentimes, the local people themselves manage on their own when it comes to handling the impacts of disasters. For instance, when a tree falls down, the local people themselves will carry it, unless there is an extreme damage on properties. Most often than not, the local people in the barangays themselves handle the situation on their own, however, if that is not the case, then they will ask help from the Municipal Hall. Then, if three or more barangays cannot handle the situation on their own, they ask for help from the PDRRMC. It involves a step by step process starting from the barangay level up to the provincial level.

Figure 4. Mind map of the Municipal DRRM Plan of Porac, Pampanga

The mind map illustrated above is mainly based on the result of the key informant interviews conducted with the government officials. It provides a summary of key points in the interviews that gives an overview of the components of the plan.



Conclusion and Recommendations

Based on the data gathered from the desk review and the results of the key informant interviews, there is an initiative not only on the part of the LGU, but also on the side of the local community in DRR. The MDRRMC works in coordination with other government agencies, sectors, and barangays, and it is through this coordination that the local community gets to participate and be recognized for their capacities in DRR. Specifically, the municipality practices Community-Based Disaster Risk Reduction and Management and through this practice, the Aeta community is given the chance to voice out their concerns and needs in the practice of DRR. The Aeta community is well-represented through the IPMR and the Barangay Captains of the five upland barangays. However, even if they are appropriated positions in the LGU, this does not assure that all of their local knowledge and context are considered in the DRRM Plan of the municipality.

The information contained in the plan about the hazard profile of the community is mostly scientific-based. Hence, there is no popular input coming from the Aeta community and other marginalized sectors about their sources of vulnerabilities and capacities which is essential in making DRR more inclusive. Furthermore, as it is evident in the statements of the key informants and the policies specified in the DRRM Plan, the approach of implementing the plan is still technocratic and hierarchical in nature. This is due to the fact that the role of the IPMR and Barangay Captains of the upland barangays is still limited to the dissemination of information coming from the top. This means that the transmission of knowledge and information is one-sided, and there is no mutual exchange of both local and scientific knowledge. The fact remains that the local knowledge and practices, and context of the Aetas in the field of disaster risk are still being overlooked. While it is true that they are given the opportunity to participate and be part of the decision-making process, the highest position accorded to them is only up to the barangay level. It is a good start for the municipality, however, they have a lot of room for improvement when it comes to understanding the root causes of the disasters that the local community continues to face.

The DRRM Official explained that one of the hindrances in integrating local knowledge in the DRRM Plan of the municipality is the lack of political will of the Barangay Chairmans from the BDRRMC. He mentioned that they are not that active and as a result, there is a late submission of the DRRM Plans. However, the researcher thinks it is more than that because the researcher thinks it all boils down to the existing institutional framework which suppresses the crucial role of the local community.

Recommendations

For the Municipality of Porac

In order to further integrate the Aeta community and their local knowledge, the first step is to make local knowledge tangible and reliable to both the Aeta community and the government officials. This is an essential step for the identification of the vulnerability and capacities of the Aetas, which only manifest once hazards arrive. Through this, the grounds for dialogue within the community and between the community and external actors are established. Consequently, to achieve this, existing tools which are trusted by all parties involved in DRR and which would facilitate the integration of local knowledge and actions in the municipal DRRM Plan should be utilized. Once the tools are proven to be feasible and effective towards the integration of local knowledge and practices, they should eventually be integrated in the institutional framework of the municipality in the implementation of the DRRM Plan. Furthermore, local government institutions and policies need to support the tools and frameworks adopted for them to be sustainable. It is recommended that the MDRRM Council of Porac conduct regular consultations with the Aeta community to give recognition on their role in DRR, their capacities and local knowledge. Finally, it is evident in the findings that agriculture is the main source of livelihood of the Aeta community, which serves as a form of capacity for them in facing natural hazards. However, in the field of DRR, the municipality only focuses on the monitoring and reporting of damages in the field when the hazards strike. Nonetheless, the municipality supports them by providing them with seedlings to plant. Even so, the Barangay Captain of Camias expressed her concern about the inadequacy of what they get out of agriculture in terms of financial needs. Therefore, the LGU can focus on the diversification of crops and the benefits that it can offer in sustaining the needs of the local community.

For Further Studies

Seeing that the results of the research study were limited to the knowledge and experiences of the local government officials, further studies can also include the perspectives of the Aeta community or the local community regarding their local knowledge and practices, and their roles in the practice of DRR. Additionally, further studies can initiate and propose a research project for a participatory three-dimensional mapping with the Aeta community, other sectors, and the MDRRM Council. The aim of the project is mainly to bridge the existing gap between the exchange of scientific and local knowledge and collaboration among all the stakeholders. The research study can be more comprehensive and substantial if the side of the local community is heard since they are the ones who will benefit the most with the results of the study.

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Annex 1: Letter of Intent Addressed to the Municipal Mayor

ATENEO DE MANILA UNIVERSITY
Loyola Schools
Development Studies Program

Hon. Condralito B. Dela Cruz
Municipal Mayor
Porac, Pampanga

Dear Sir:

I am Zoe R. Jimenez, a Development Studies major of Ateneo de Manila University, and as part of the requirements in our senior year, I am conducting a research study on the **Critical Analysis on the Process of Integration of the Aeta Community and their Local Knowledge in the Municipal DRRM Plan of the Local Government Unit of the Municipality of Porac, Pampanga.**

The reason why I chose the municipality of Porac in the province of Pampanga as my area of study is because of the presence of the Aeta community in the area and their experience of disaster events in the previous years, which is crucial in developing their local knowledge on disaster risk reduction.

In order to fulfil the objectives of the study, I need to conduct KIIs or Key Informant Interviews with the key officials or officers of the Municipal Disaster Risk Reduction Management Council of Porac. Their insights and knowledge on the topic is valuable in conducting the study. Hence, I would like to request for your permission in conducting the study and to set interviews with the MDRRM Council. Rest assured that all the information disclosed by the officers would be regarded with utmost confidentiality.

Respectfully yours,

Zoe Jimenez
4 AB Development Studies
Ateneo de Manila University

Noted by:

Benigno C. Balgos
Supervisor
Adviser, Development Studies Program
Ateneo de Manila University

Annex II: Letter of Intent Addressed to the MDRRM Officer

ATENEO DE MANILA UNIVERSITY
Loyola Schools
Development Studies Program

Mr. Francis S. Caligagan
MDRRM Officer
Porac, Pampanga

Dear Sir:

I am Zoe R. Jimenez, a Development Studies major of Ateneo de Manila University, and as part of the requirements in our senior year, I am conducting a research study on the **Critical Analysis on the Process of Integration of the Aeta Community and their Local Knowledge in the Municipal DRRM Plan of the Local Government Unit of the Municipality of Porac, Pampanga.**

The reason why I chose the municipality of Porac in the province of Pampanga as my area of study is because of the presence of the Aeta community in the area and their experience of disaster events in the previous years, which is crucial in developing their local knowledge on disaster risk reduction.

In order to fulfil the objectives of the study, I need to conduct KIIs or Key Informant Interviews with you and the other key officials of the Municipal Disaster Risk Reduction Management Council of Porac. Your insights and knowledge on the topic is valuable in conducting the study. Hence, I would like to request for your permission in conducting the study and to set interviews with the MDRRM Council. Rest assured that all the information disclosed would be regarded with utmost confidentiality.

Respectfully yours,

Zoe Jimenez
4 AB Development Studies
Ateneo de Manila University

Noted by:

Benigno C. Balgos
Supervisor
Adviser, Development Studies Program
Ateneo de Manila University

Annex III: Key Informant Interview Guide 1

Key Informants: Mr. Francis S. Caligagan (MDRRM Officer) and Mr. Ralph Reyes (DILG Administrative Assistant)

I. Planning process

1. Can you describe the process of developing your DRRM plan?

II. Policy formulation

1. How did you come up with the objectives, outcomes, outputs, and activities under each of the thematic area (each thematic area will be explained)?
2. Is the local knowledge on disaster risk reduction of the community in the barangay included in the DRRM plan?
    1. If yes, how is it integrated?
    2. If no, what were the things they considered during the formulation of the DRRM plan?

III. Implementation mechanisms

1. How did you go about the implementation ever since the completion of the plan?
1. Were there any problems or difficulties encountered during implementation?
    1. What are those?
    1. Were you able to resolve or offer solutions to those problems?

The interview guide above was constructed in reference to all of the three components or sections of Gaillard and Mercer's road map to see specifically whether or not there is an integration of local knowledge, the local community, and the bottom-up initiatives from the decision-making process until the stage of implementation.

Annex IV: Key Informant Interview Guide 2

Key informants: Mr. Francis S. Caligagan (DRRM Officer), Ma'am Marites C. Miranda (DILG Officer/Municipal Local Government Operations Officer), Ma'am Gemma S. Danan (Barangay Captain of Camias)

I. Risk Assessment

1. Scientific knowledge
   a. Where do you get the data and information for your DRRM Plan?
   b. How do you disseminate these data and information?
2. Local knowledge
   a. How does the local community understand disasters?
   b. What are the practices of the Aeta community before, during, and after a disaster?
   c. What are the resources and assets you use in times of disaster?

II. Dialogue

1. Outside actors (scientists, governments, NGOs)
   a. What are the NGOs involved in the DRRM Plan?
2. Inside actors (communities including marginalized groups)
   a. Who are the other stakeholders involved in the DRRM Plan?
      i. How about the local community?

III. Action

1. Top-down
   a. What are your activities and programs for the following?
      i. Disaster Prevention and Mitigation
      ii. Disaster Preparedness
      iii. Disaster Response
      iv. Disaster Recovery and Rehabilitation
   a. How do you collaborate with the local community when it comes to DRR?
2. Bottom-up
   a. Do you know any initiatives done by the local community themselves?

Abstract Only — In Between Marginalization and Transformation Weighing the Conditions of Possibility Among the Aetas of Mabalacat City, Pampanga in the Globalizing Clark Special Economic Zone

Madeleine Jan T. Ong

Ateneo de Manila University

Abstract

The global neoliberal consensus for a market economy deepened the social inequalities among indigenous cultural communities. In the Philippine context, the overlapping policy regimes of the Indigenous Peoples Rights Act (IPRA) and Bases Conversion and Development Act (BCDA) led to conflict of laws and confusion of authority in managing ancestral domains within Philippine economic zones. In response, the study investigates the case of the Aeta communities in the Clark Special Economic Zone (CSEZ) by identifying their social, political and economic issues and corresponding responses to the globalizing development of Clark. Although the gray areas of the IPRA and BCDA laws challenged the rights of the indigenous tribes to ancestral domains, cultural integrity and self-governance, the research validates the possibility of coexistence between the neoliberal market economy of freeport zones and the indigenous social practices of the Aetas through the Joint Management Agreement (JMA). Through Critical Discourse Analysis, the study examines the different material, discursive and structural conditions of possibility among the Aetas of Mabalacat City, Pampanga to remain or go beyond the 'margins' of the globalizing Clark ecozone.

Abstract Only — Building School Resiliency: The Case of Laguna State Polytechnic University – Los Baños Campus, Laguna, Philippines

Andrew S. Arellano, Jo Anne E. Francisco, Julyven Marta Fridas P. Maniscan, Sheryl B. Posadas, and Abigail dC. Salvania

College of Public Affairs and Development University of the Philippines, Los Baños

Abstract

The Philippines is one of the top countries vulnerable to disasters. For the past years, disasters have greatly affected the education sector of the country; hence, reducing disaster risk should be given utmost importance in the education sector.

The locale of the study is the Laguna State Polytechnic University - Los Baños (LSPU-LB) campus situated in the coastal area of Laguna de Bay, Laguna, Philippines. The school is locally known to be highly vulnerable to disasters particularly flooding in the events of excessive rain and typhoons due to its proximity to the lake. The study adapted the Toolkit for Building Disaster Resilient School Communities in Southeast Asia by SEAMEO Innotech to tailor fit it for higher education institution in Southeast Asia particularly in the Philippines, geared towards building disaster-resilient school communities. The study also suggested a framework for HEI DRRM assessment of resiliency through the three pillars and four thematic areas. Primary and secondary data were collected and analysed using descriptive-qualitative method. The school obtained a moderately resilient rating - based on the pillars (57.49%) with higher score on SLF, and RRRE, while obtaining relatively low score on SDM; on the thematic areas (54.69%), the school acquired the highest score on Disaster Response while the lowest on Disaster Rehabilitation and Recovery.

The findings can serve as input to enhance the school's DRRM, specifically in prioritization of areas for improvement. The study also promotes the importance of mainstreaming DRR in the education sector while adopting multi-sectoral approach in building school resiliency.

Keywords: Hazards, Resiliency, Disaster Risk, Resilient School Communities

Annexes

Annex I Participant List

No.	First Name	Last Name	Organisation	Country	Sex
1	Catherine Joy	Rumbines	United Nations Development Programme	Philippines	Female
2	Patsu	Norrakarnkumphon	Thammasat University	Thailand	Male
3	Karen Joyce	Cayamanda	University of the Philippines Mindanao	Philippines	Female
4	Mitchiko	Lopez	University of the Philippines Mindanao	Philippines	Female
5	Dennis	Sumaylo	University of the Philippines Mindanao	Philippines	Male
6	Colleen	Curran	Asian Institute of Technology	Philippines	Female
7	Suryani	Amin	United States Agency for International Development	Indonesia	Female
8	Kampanart	Silva	Thailand Institute of Nuclear Technology	Thailand	Male
9	Wilma	De Los Santos	Mindoro State College of Agriculture and Technology	Philippines	Female
10	Leonardo	Camacho	Supreme Court of the Philippines	Philippines	Male
11	Sirinon	Suwanmolee	King Mongkut's University of Technology Thonburi	Thailand	Female
12	Ian	Secillano	Municipality of Libon - Philippines	Philippines	Male
13	Saut	Sagala	Institut Teknologi Bandung	Indonesia	Male
14	Maria Cristina	Alvarez	University of the Philippines Los Banos	Philippines	Female
15	Agnes	Rola	University of the Philippines Los Banos	Philippines	Female
16	Priyanka	Bhalla	International Federation of Red Cross and Red Crescent Societies	Singapore	Female
17	Warittha	Wannathong	Asian Disaster Preparedness Center	Thailand	Female
18	Yuli	Dewi	Politeknik Bina Trada Semarang	Indonesia	Female
19	Praditya	Adhitama	Resilience Development Initiative	Indonesia	Male
20	Yasmina	Wulandari	Resilience Development Initiative	Indonesia	Female
21	Zoe	Jimenez	Ateneo de Manila University	Philippines	Female
22	Madeleine Jan	Ong	Ateneo de Manila University	Philippines	Female

No.	First Name	Last Name	Organisation	Country	Sex
23	Jo Anne	Francisco	University of the Philippines Los Banos	Philippines	Female
24	Kanrawee	Wichaipa	Mahidol University	Thailand	Female
25	Noralene	Uy	Ateneo de Manila University	Philippines	Female
26	Chatpan	Chintanapakdee	Chulalongkorn University	Thailand	Male
27	Tavida	Kamolvej	Thammasat University	Thailand	Female
28	Sikarn	Issarachaiyos	Thammasat University	Thailand	Female
29	Parichatt	Krongkant	KPC Consultant Co., Ltd	Thailand	Female
30	Teeranong	Sakulsri	Mahidol University	Thailand	Male
31	Nattapon	Sang-arun	Thammasat University	Thailand	Male
32	Tatchalerm	Sudhipongpracha	Thammasat University	Thailand	Male
33	Takashi	Tsukamoto	Thammasat University	Thailand	Male
34	Piyapong	Boossabong	Chiang Mai University	Thailand	Male
35	Amparita delos Santos	Sta. Maria	Ateneo de Manila University	Philippines	Female
36	Pauline	Caspellan-Arce	International Federation of Red Cross and Red Crescent Societies	Philippines	Female
37	Prakarma Raja	Siregar	International Federation of Red Cross and Red Crescent Societies	Indonesia	Male
38	Randy	Adrian	Association of Southeast Asian Nations	Indonesia	Male
39	Lorn	Trob	National Committee for Disaster Management - Cambodia	Cambodia	Male
40	Danial	Hamdan	National Disaster Management Agency	Malaysia	Male
41	Chainarong	Vasanasomsithi	Disaster Prevention and Mitigation Office - Thailand	Thailand	Male
42	Nguyen Quynh	Nga	Ministry of Agricultural and Rural Development	Vietnam	Female
43	Warongrong	Tatrakom	International Federation of Red Cross and Red Crescent Societies	Thailand	Female
44	Herve	Gazeau	International Federation of Red Cross and Red Crescent Societies	Thailand	Male
45	Tiamkare	Thitithamtada	International Federation of Red Cross and Red Crescent Societies	Thailand	Female
46	Suriyada	Kachenchai	International Federation of Red Cross and Red Crescent Societies	Thailand	Female
47	Aileen	Lapitan	University of the Philippines Los Banos	Philippines	Female

No.	First Name	Last Name	Organisation	Country	Sex
48	Natnicha	Chaiviriyapong	Thammasat University	Thailand	Female
49	Suphorn	Mukphimphan	Thammasat University	Thailand	Female
50	Alistair	Cook	Nanyang Technological University	Singapore	Male
51	Ari	Arif	United States Agency for International Development	Indonesia	Male
52	Julius	Manzano	Mariano Marcos State University	Philippines	Male
53	Pattama	Vongratanavichit	Embassy of Canada - Thailand	Thailand	Female
54	Manzul	Hazarika	Asian Institute of Technology	Thailand	Male
55	Rafiq	Anshori	Indonesian Red Cross Society (Palang Merah Indonesia)	Indonesia	Male
56	Kaviphone	Southy	Lao Red Cross	Lao PDR	Male
57	Pennung	Warnitchai	Asian Institute of Technology	Thailand	Male
58	Michaela	Friberg	International Federation of Red Cross and Red Crescent Societies	Thailand	Female
59	Runjini	Raman	International Federation of Red Cross and Red Crescent Societies	Thailand	Female
60	Napawan	Panya	Disaster Prevention and Mitigation Office - Thailand	Thailand	Female
61	Pisith	Wongthianthana	Disaster Prevention and Mitigation Office - Thailand	Thailand	Male
62	Nipa	Jitprakob	Disaster Prevention and Mitigation Office - Thailand	Thailand	Female
63	Suttapak	Panpapai	Disaster Prevention and Mitigation Office - Thailand	Thailand	Female
64	Iria	Calle	United Nations Office for Disaster Risk Reduction	Thailand	Female
65	Hung	Nguyen	International Federation of Red Cross and Red Crescent Societies	Thailand	Male
66	Prajak	Kongkirati	Thammasat University	Thailand	Male

Annex II List of Academic Papers

No	Paper Title	Authors	Link to Paper Presentation
1	Post-Haiyan Evaluation of Development Aid Projects and Disaster-Resilient Community Index in Tacloban City, Leyte, Philippines	Catherine Joy Rumbines	Link
2	The Value of Collective and Individual Assets in Building Urban Community Resilience	Wijitbusaba Marome Diane Archer Boonanan Natakun Nuttavikhom Phanthuwongpakdee	Link
3	A Reception Analysis of the risk communication system among the flood-prone communities in Davao City, Southern Philippines: An Exploratory Sequential Research	Karen Joyce G. Cayamanda	Link
4	Community resilience to urban flooding: A Case Study of the 2011 Flash Flood in Matina, Davao City, Southern Philippines	Karen Joyce G. Cayamanda Mitchiko A. Lopez	Link
5	Potentials and Pitfalls of Crowdsourcing in Disaster Communication: A Systematic Review	Asst. Prof. Dennis John F. Sumaylo	Link
6	Applications of Spaced-Based Technology and Information and Communication Technology to Strengthen Disaster Resilience: A Case Study in the Philippines	Manzul Kumar Hazarika Colleen Curran Syams Nashrrillah	Link
7	Establishing an Inclusive and Collaborative Approach in Creating Local Regulations for Climate & Disaster Resilience in Indonesia	Ari Mochammad Suryani Amin	Link
8	Incorporating Scientific Research Outputs into Emergency Preparedness and Response Planning: Two Case Studies on Nuclear Accident Consequence Assessment	Kampanart Silva Wasin Vechgama	Link
9	Strengthening Capacities of the Local Government Unit of Garchitorena for Disaster Preparedness and Climate Risk Reduction and Management	Wilma C. De Los Santos Henry A. Mabesa, Jr.	Link
10	Aid and Accountability: The State's Obligation to Ensure Transparency and Accountability as to International Disaster Aid and Assistance	Atty. Leonardo M. Camacho	Link
11	Gamified Disaster Education: From Chaingrai Earthquake lesson learnt to board game	Sirinon Suwanmolee	Link
12	From Experience to Change: Lessons Learned from 2018 Mayon Volcanic Eruption	Ian James S. Secillano	Link

No	Paper Title	Authors	Link to Paper Presentation
13	What are the gaps in the implementation of climate change adaptation financing in Indonesia?	Saut Sagala Ramanditya Wimbardana Raja Siregar Nur Febriani Wardi	Link
14	Climate Information and Adaptation in Rice Farming: Observations from the Philippines	Aileen V. Lapitan Agnes C. Rola Maria Cristina A. Alvarez Joy C. Lizada Purisima G. Bayacag Virgilio Julius P. Manzano Jr.	Link
15	Challenges in Climate Information Services (CIS) Provisioning in Philippine Agriculture: Results of a Baseline Survey	Aileen V. Lapitan Agnes C. Rola Maria Cristina A. Alvarez Joy C. Lizada Purisima G. Bayacag Virgilio Julius P. Manzano Jr.	Link
16	Why and how does the risk to gender-based violence increase during disasters?	Priyanka Bhalla	Link
17	Best Practices on Gender and Diversity Mainstreaming in Disaster Risk Management Systems: Vietnam Case Study	Warittha Wannathong Napapan Der Kinderen Quyen Nguyen	Link
18	Gender and Diversity in Psychosocial Support Programme A Content analysis of Indonesian Red Cross Psychosocial Debriefing Programme Manual	Yuli Arinta Dewi Habib Priyono Deasy Sujatiningrani	Link
19	Towards Disaster Resilience: The role of Multi Donor Trust Fund for Indonesia Disaster Management	Praditya Adhitama Saut Sagala	Link
20	Recognizing Women and Marginalized Communities' Perspective in Disaster Risk Reduction. Case Study: Bandar Lampung City, Indonesia	Yasmina Wulandari Rizkita Mardea Nurdiandra Saut Sagala	Link
21	A Critical Analysis on the Process of Integration of the Aeta Community and their Local Knowledge in the Municipal DRRM Plan of the Local Government Unit of the Municipality of Porac, Pampanga	Zoe Jimenez	Link
22	In between Marginalization and transformation: Weighing the conditions of possibility among the Aetas of Mabalacat City, Pampanga in the globalizing Clark Special Economic Zone	Madeleine Jan Ong	Link

No	Paper Title	Authors	Link to Paper Presentation
23	Building School Resiliency: The Case of Laguna State Polytechnic University - Los Banos Campus, Laguna, Philippines	Andrew S. Arellano Jo Anne E. Francisco Julyven Marta Fridas P. Maniscan Sheryl B. Posadas Abigail dC. Salvania	Not available
24	The Study of Disaster Management Competency and Indicators in Thailand Local Administration	Kanrawee Wichaipa	Link

Note: Paper number 21-24 are written by graduate students

Annex III List of Peer Reviewers and Peer Review Guidelines

Guidelines for the Peer Review Committee

Peer Review Committee: The Peer Review Committee shall be composed of at least eight (8) lead peer reviewers holding a doctoral degree or its equivalent in the relevant field. Supporting peer reviewers holding a master's degree or its equivalent in the relevant field shall also be selected.

Partner academic institutions shall provide at least two (2) peer reviewers holding a doctoral degree or its equivalent in the relevant field.

IFRC shall provide two (2) peer reviewers.

Non-academic partners shall provide peer reviewers, either lead or supportive, depending on the academic/professional expertise of each person, preferably DRM practitioners.

Peer Review Team: A peer review team for each abstract / paper shall be composed of at least two (2) members - one (1) lead peer reviewer and one (1) supporting peer reviewer. If available, a practitioner will join the peer review team to ensure a balanced assessment of the material.

Editor in Chief (EIC): The organizing committee led by Thammasat University shall appoint EIC of the publication on the first Peer Review Committee meeting on 23 July. Thammasat University shall be accountable for the EIC's performance of responsibilities.

List of confirmed peer reviewers:

NAME OF PEER REVIEWER	ROLE	INSTITUTION	COUNTRY	PEER REVIEW SUB-THEME[18]
Dr. Jonatan Lassa	Lead PR	Charles Darwin University	Australia	1,2
Dr. Saut Sagala	Lead PR	Institute of Technology Bandung (ITB)	Indonesia	1,3
Dr. Kenneth Hartigan Go, MD, Ph.D.	Lead PR	Asian Institute of Management	Philippines	1,3
Dr. Emma Porio, Ph.D.	Lead PR	Ateneo de Manila University	Philippines	1,2
Atty. Amparita Sta. Maria, LL.B., LL.M.	Supporting PR	Ateneo de Manila University	Philippines	2,3
Mr. Angelo Trias, LL.M.	Supporting PR	Asian Institute of Management	Philippines	1,3
Dr. Noralene Uy, Ph.D.	Lead PR	Ateneo de Manila University	Philippines	1,3
Dr. Piyapong Boossabong	Lead PR	Chiang Mai University	Thailand	1,3
Dr. Chatpan Chintanapakdee, Ph.D.	Lead PR	Chulalongkorn University	Thailand	1,3

18. Sub-theme 1 = Climate and disaster risk-informed policy making
Sub-theme 2 = Gender and diversity mainstreaming in disaster risk management systems
Sub-theme 3 = Institutional structures and mechanisms for inclusive disaster risk governance
Sub-theme 4 = Mechanisms for regional cooperation towards climate-smart disaster risk management system

NAME OF PEER REVIEWER	ROLE	INSTITUTION	COUNTRY	PEER REVIEW SUB-THEME[18]
Dr. Sikarn Issarachaiyos	Lead PR	Thammasat University	Thailand	1
Dr. Tavida Kamolvej, Ph.D.	Lead PR	Thammasat University	Thailand	1
Dr. Somporn Khunwishit	Lead PR	Prince of Songkhla University	Thailand	3
Dr. Parichatt Krongkant	Lead PR	Independent	Thailand	1,3
Dr. Teeranong Sakulsri	Lead PR	Mahidol University	Thailand	2,3
Dr. Nattapon Sang-arun	Lead PR	Thammasat University	Thailand	3
Dr. Tatchalerm Suthi-pongpracha	Lead PR	Thammasat University	Thailand	1
Dr. Vannapar Tirasangka	Lead PR	Thammasat University	Thailand	1,3
Dr. Peeranan Towashiraporn	Lead PR	Asian Disaster Preparedness Center	Thailand	3
Dr. Priyanka Bhalla, Ph.D.	Supporting PR	IFRC Asia Pacific Regional Office	Malaysia	2
Atty. Pauline Caspellan – Arce, JD	Supporting PR	IFRC Asia Pacific Regional Office	Philippines	1,3
Donna Mitzi Lagdameo	Supporting PR	IFRC Asia Pacific Regional Office	Philippines	1
Intani Nur Kusuma	Supporting PR	ASEAN Secretariat	Indonesia	3

Guidelines for the Peer Review

Abstracts

Review of Abstracts

The Peer Review Committee will use a collaborative approach to the review.

A Peer Review Team of at least two (2) peer reviewers working together will be assigned to each abstract. The organizing team will inform all peer reviewers of the abstracts that they will review.

The organizing team will provide the template for a joint Peer Review Report by **19 July**.

The Peer Review Team shall submit their joint Peer Review Report for each assigned abstract by **22 July**.

Each report will have a score (1 – lowest, 10 – highest) based on a points system / peer review questions agreed on by the Peer Review Committee.

The identity of peer reviewers will be disclosed as a group in the proceeding.

Shortlisting of Abstracts (19-31 July 2018)

In a meeting on 23 July, each Peer Review Team shall present their joint Peer Review Reports with recommendations to the Peer Review Committee. Final decisions on shortlisted abstracts shall be reached by the Peer Review Committee based on consensus.

Papers

Review of Papers

A Peer Review Team of at least two (2) peer reviewers will be assigned to each paper. The organizing team will inform all peer reviewers of the papers that they will review. Peer Reviewers may be reassigned to other papers in case the abstracts earlier assigned to them were not shortlisted.

The organizing team will provide the template for a Peer Review Report by **31 August**.

Within 1-20 September, the Peer Reviewers will review the papers and submit their individual Peer Review Report for each assigned paper by **21 September** to (tiamkare.thitithamtada@ifrc.org, oia.polsci@gmail.com, and project.polsci@gmail.com).

The identity of peer reviewers will be disclosed as a group in the proceeding.

Thammasat University shall communicate the Peer Review Report to the authors after the seminar for his/her information or appropriate action. Subsequent comments, queries and revisions between the peer reviewer and the author will be coordinated by Thammasat University.

Finalization of Papers for Publication (25 September – end of 2018)

Authors are expected to make revisions based on the peer reviewers' comments and submit their final draft by **31 October**.

As a general rule, all papers based on the shortlisted abstracts will be included in the final publication, provided that the authors sufficiently comply with the peer review revisions and recommendations.

The Editor-in-Chief, in consultation with IFRC, shall ensure that all selected peer-reviewed papers are in acceptable form and ready for publication as of the agreed timeline.

IFRC is responsible for printing the final publication.

Annex IV Peer Review Questions

The following questions will guide the peer review scoring system for the shortlisting of abstracts. For the peer review of papers, there will be no scoring system, but the same questions will apply in the review before these are accepted for publication.

Peer reviewers are welcome to make relevant additional comments to the abstracts and papers assigned to them.

Compliance with guidelines – 0 to 1 point

- Does the abstract / paper comply with the basic instructions provided for by the organizers (i.e. font, length, spacing, conference theme or sub-theme)?

Originality and relevance – 0 to 1 point

- How original is the topic? What does it add to the subject area compared with other published material?

Reasoning – 0 to 3 points

- Is the research question clearly set out in the abstract/paper? Is it relevant and interesting?
- Are the conclusions consistent with the evidence and arguments presented? Do they address the main question posed?
- If the author is disagreeing significantly with the current academic consensus on the topic, is the author able to argue a substantial case? If not, what would be required to make the case credible?

Soundness of research framework – 0 to 3 points

- Does the author use a research framework (i.e. research method, conceptual framework, analytical framework) that is relevant to the area of study?
- If it is a novel / experimental framework, is it clear why the author selected this framework in relation to the topic?
- Is the research framework consistently applied throughout the paper?

Quality of writing – 0 to 2 points

- Is the paper well written? Is the text clear and easy to read, and avoids unnecessary use of superfluous words?
- Does the author refer to different kinds of sources to build his/her arguments? Does the author include sufficient primary sources in the research?
- Does the paper properly cite its sources?

Source: *See How to perform a peer review.* Wiley Author Services, accessed at https://authorservices.wiley.com/Reviewers/journal-reviewers/how-to-perform-a-peer-review/index.html, on July 02, 2018

Annex V Seminar Agenda

Southeast Asia Disaster Risk Governance Academic Seminar

** All speakers are subjected to confirmation*

24 SEPTEMBER 2018	
Time/ Room No.	**Activities**
08.00 – 08.30 Room 103	**Registration**
08.30 – 09.00 Room 103	**Opening Remarks** • ***Assoc. Prof. Gasinee Witoonchart,*** Rector of Thammasat University • ***Ms. Michaela Friberg,*** Humanitarian Diplomacy Advisor for Asia Pacific, International Federation of Red Cross and Red Crescent Societies (IFRC) • ***Mr. Chainarong Vasanasomsithi,*** Deputy Director General of the Department of Disaster Prevention and Mitigation, Thailand and ASEAN Representative
09.00 – 09.45 Room 103	**Session 1: Keynote "Some Key Issues of Disaster Risk Reduction in Asia"** • ***Dr. Pennung Warnitchai,*** Head of Department of Civil & Infrastructure Engineering, Asian Institute of Technology (AIT)
09.45 – 10.15 Room 103	**Press Conference/ Photo Session** • ***Assoc. Prof. Dr. Kitti Prasirtsuk,*** Vice Rector for International Affairs, Thammasat University • ***Asst. Prof. Dr. Tavida Kamolvej,*** Dean of the Faculty of Political Science, Thammasat University • ***Prof. Dr. Pennung Warnitchai,*** Head of Department of Civil & Infrastructure Engineering, AIT • ***Ms. Michaela Friberg,*** Humanitarian Diplomacy Advisor for Asia Pacific, IFRC **- Moderator:** *Dr. Prajak Kongkirati*
10.15 – 10.30 Room 101	**Coffee Break**
10.30 – 12.00 Room 103	**Session 2: Panel Discussion on "Disaster Risk Governance in Southeast Asia"** (Plenary) • ***Mr. Chainarong Vasanasomsithi,*** Deputy Director General of the Department of Disaster Prevention and Mitigation, Thailand and ASEAN Representative • ***IFRC*** Disaster Law Programme – ***Mr. Herve Gazeau,*** Disaster Risk Reduction Manager, IFRC Bangkok • Thammasat University, ***Dr. Tavida Kamolvej,*** Dean of Faculty of Political Science, Thammasat University • Presentation by ***Ms. Iria Touzon Calle,*** Risk Knowledge and Analysis Programme Officer, UN International Strategy for Disaster Reduction **- Moderator:** *Takashi Tsukamoto*

24 SEPTEMBER 2018

Time/ Room No.	Activities
12.00 – 13.00	**Lunch**
13.00 – 14.30 Room 202	**Session 3: Sub-theme 1(1) & Sub-theme 3 (1)** (Break-out rooms)

Sub-theme 1(1)

Paper Tile	Presenter	Discussant
• Community resilience to urban flooding: A Case Study of the 2011 Flash Flood in Matina, Davao City, Southern Philippines	Mitchiko A. Lopez	Dr. Noralene M. Uy
• Strengthening Capacities of the Local Government Unit of Garchitorena for Disaster Preparedness and Climate Risk Reduction and Management	Wilma C. De Los Santos	Dr. Sikarn Issarachaiyos
• Gamified Chiangrai Earthquake lesson learnt for Disaster Education	Sirinon Suwanmolee	Dr. Parichatt Krongkant

-Moderator: *Assoc. Prof. Dr. Chanintira Na Thalang*

Room 102

Sub-theme 3(1)

Paper Tile	Presenter	Discussant
• A Reception Analysis of the risk communication system among the flood-prone communities in Davao City: An Exploratory Sequential Research	Karen Joyce G. Cayaman-da	Asst. Prof. Chatpan Chintanapakdee
• Potentials and Pitfalls of Crowdsourcing in Disaster Communication: A Systematic Review	Asst. Prof. Dennis John F. Sumaylo	Dr. Alistair Cook
• Applications of Spaced-Based Technology and ICT to Strengthened Disaster Resilience	Colleen Curran	Asst. Prof. Chatpan Chintanapakdee
• Towards Disaster Resilience: The role of Multi Donor Trust Fund for Indonesia Disaster Risk Management	Praditya Adhitama	Dr. Piyapong Boossabong

-Moderator: *Dr. Iain Cowie*

14.30 – 15.00 Room 101	**Coffee Break**

24 SEPTEMBER 2018

Time/ Room No. | **Activities**

15.00 – 16.30
Room 202

Session 4: Sub-theme 1(2) & Sub-theme 3(2)
(Break-out rooms)

Sub-theme 1(2)

Paper Tile	Presenter	Discussant
• Aid and accountability: the state's obligation to ensure transparency and accountability as to international disaster aid and assistance	Leonardo M. Camacho	Dr. Sikarn Issarachaiyos
• What are the gaps in the implementation of climate change adaptation financing in Indonesia?	Dr. Saut Sagala	Dr. Tatchalerm Suthipongpracha
• Climate information and adaptation in rice farming: Observations from the Philippines	Maria Cristina Alvarez	Dr. Tavida Kamolvej
• State of the Art of Climate Information System (CIS) in the Philippines	Agnes C. Rola	Dr. Piyapong Boossabong

-Moderator: *Dr. Takashi Tsukamoto*

Room 102

Sub-theme 3(2)

Paper Tile	Presenter	Discussant
• Post-Haiyan Evaluation of Development Aid Projects and Disaster-Resilient Community Index in Tacloban City, Leyte, Philippines	Catherine Joy Rumbines	Dr. Noralene M. Uy
• Establishing a collaborative and inclusive approach in creating local regulations for climate and disaster resilience in Indonesia	Ari Mochammad	Dr. Parichatt Krongkant
• Incorporation of Scientific Research Outputs into Emergency Preparedness and Response Planning: Two Case Studies on Nuclear Accident Consequence	Kampanart Silva	Dr. Alistair Cook
• From Experience to Change: Lessons Learned from 2018 Mayon Volcanic Eruption	Ian James S. Secillano	Asst. Prof. Chatpan Chintanapakdee
• The Value of Collective and Individual Assets in Building Urban Community Resilience	Diane Archer	Dr. Teeranong Sakulsri

-Moderator: *Dr. Iain Cowie*

17:00 – 19:00 | **Cocktail dinner on campus** (Room 107, 1st fl. Faculty of Liberal Arts)

<table>
<tr><th colspan="2">25 SEPTEMBER 2018</th></tr>
<tr><th>Time/
Room No.</th><th>Activities</th></tr>
<tr><td>08.30 – 09.00
Room 202</td><td>Registration</td></tr>
<tr><td>09.00 – 10.30
Room 404</td><td>Session 5: Sub-theme 2
(Plenary)
<table><tr><th>Paper Tile</th><th>Presenter</th><th>Discussant</th></tr><tr><td>• Why and how does the risk to gender-based violence increase during disasters? Evidence from the Philippines, Indonesia and Lao PDR</td><td>Dr. Priyanka Bhalla</td><td>Dr. Tavida Kamolvej</td></tr><tr><td>• Best Practices on Gender and Diversity Mainstreaming in Disaster Risk Management Systems: Vietnam Case Study</td><td>Napapan Der Kinderen</td><td>Dr. Tavida Kamolvej</td></tr><tr><td>• Gender and Diversity in Psychosocial Support Programme A Content analysis of Indonesian Red Cross Psychosocial Debriefing Programme</td><td>Yuli Arinta Dewi</td><td>Dr. Priyanka Bhalla</td></tr><tr><td>• Recognizing Women and Marginalized Communities’ Perspective in Disaster Risk Reduction. Case Study: Bandar Lampung City, Indonesia</td><td>Yasmina Wulandari</td><td>Dr. Priyanka Bhalla</td></tr><tr><td>• In between Marginalization and transformation: Weighing the conditions of possibility among the Aetas of Mabalacat City, Pampanga in the globalizing Clark Special Economic Zone</td><td>Madeleine Jan Ong</td><td>Dr. Tavida Kamolvej</td></tr></table>-Moderator: Asst. Prof. Dr. Sunida Aroonpipat</td></tr>
<tr><td>10.30 – 11.00
Room 101</td><td>Coffee Break</td></tr>
<tr><td>11.00 – 12.30
Room 404</td><td>Session 6: Practitioners Presentation
(20 minutes each and 10 minutes for Q&A)
(Plenary)
• Randy Adrian, Officer of Disaster Management and Humanitarian Assistance Division, ASEAN Secretariat
• Pauline Caspellan-Arce, Regional Disaster Law Officer (Asia Pacific)
• Prakarma Raja Siregar, Climate and Resilience Advisor Red Cross Red Crescent Climate Center
-Moderator: Asst. Prof. Dr. M.L. Pinitbhand Paribatra</td></tr>
<tr><td>12.30 – 13.30</td><td>Lunch</td></tr>
</table>

<table>
<tr><th colspan="2">25 SEPTEMBER 2018</th></tr>
<tr><th>Time/
Room No.</th><th>Activities</th></tr>
<tr><td>13.30 – 15.00
Room 103</td><td>Session 7: Graduates Paper Presentation
(Plenary)
<table><tr><th>Paper Tile</th><th>Presenter</th><th>Discussant</th></tr><tr><td>• The Study of Disaster Management Competency and Indicators in Thailand Local Administration</td><td>Kanrawee Wichaipa</td><td>Dr. Saut Sagala</td></tr><tr><td>• A Critical Analysis on the Process of Integration of the Aeta Community and their Local Knowledge in the Municipal DRRM Plan of the Local Government Unit of the Municipality of Porac, Pampanga</td><td>Zoe Jimenez</td><td>Atty. Pauline Caspellan-Arce</td></tr><tr><td>• Building School Resiliency: The Case of Laguna State Polytechnic University - Los Banos Campus, Laguna, Philippines</td><td>Andrew Arellano</td><td>Dr. Saut Sagala</td></tr></table>-Moderator: Dr. Peera Charoenvattananukul</td></tr>
<tr><td>15.00 – 15.15
Room 101</td><td>Coffee Break</td></tr>
<tr><td>15.15 – 16.00
Room 103</td><td>Summary and Conclusion
Asst. Prof. Dr. Tavida Kamolvej, Dean of the Faculty of Political Science, Thammasat University</td></tr>
<tr><td>16.00
Room 103</td><td>Closing
• Mr. Herve Gazeau, Disaster Risk Reduction Manager, IFRC Bangkok
• Asst. Prof. Dr. Tavida Kamolvej, Dean of the Faculty of Political Science, Thammasat University</td></tr>
</table>

26 SEPTEMBER 2018 (Closed session for selected participants)	
Time/ Room No.	**Activities**
08.30 – 09.00 Room 102	**Registration**
09.00 – 09.15 Room 102	**Opening Remark and Seminar Report** • ***Asst. Prof. Dr. Tavida Kamolvej,*** Dean of the Faculty of Political Science, Thammasat University
09:15 – 10:15 Room 102	**Presentation by:** • ***Dr. Alistair D. B. Cook,*** Coordinator of Humanitarian Assistance and Disaster Relief (HADR) Programme Research Fellow, NTS Centre, S. Rajaratnam School of International Studies (RSIS) • ***Dr. Saut Sagala,*** School of Architecture, Planning and Policy Development **Facilitator:** *Dr. Takashi Tsukamoto*
10.15 – 10.30 Room 102	**Coffee Break**
10.30 – 12.30 Room 102	**Closed Session for selected participants on Way Forward to Build Collaborative Regional Disaster Risk Governance** • Government representatives • ASEAN Secretariat (DMHA Division) • Red Cross Red Crescent • Academic Partners **Moderator:** *Mr. Herve Gazeau and Ms. Pauline Caspellan-Arce*
12.30 – 13.30 Room 102	**Lunch and Closing**

Click on the link to the official page of the seminar for more information.

In partnership with:

RDM Risk and Disaster Management Program · rdi Resilience Development Initiative · Ateneo de Manila University · Asian Institute of Management 50 1968 – 2018 · Institut Teknologi Bandung 1920 · RSIS S. Rajaratnam School of International Studies · A Canada-ASEAN project. Funded by Canada · Canadian Red Cross