

Domingo, Sonny N.; Manejar, Arvie Joy A.

Working Paper

Policy, institutional, and expenditure review of bottom-up approach disaster risk reduction and management

PIDS Discussion Paper Series, No. 2021-03

Provided in Cooperation with:

Philippine Institute for Development Studies (PIDS), Philippines

Suggested Citation: Domingo, Sonny N.; Manejar, Arvie Joy A. (2021) : Policy, institutional, and expenditure review of bottom-up approach disaster risk reduction and management, PIDS Discussion Paper Series, No. 2021-03, Philippine Institute for Development Studies (PIDS), Quezon City

This Version is available at:

<https://hdl.handle.net/10419/241051>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

DISCUSSION PAPER SERIES NO. 2021-03

Policy, Institutional, and Expenditure Review of Bottom-up Approach Disaster Risk Reduction and Management

Sonny N. Domingo and Arvie Joy A. Manejar



The PIDS Discussion Paper Series constitutes studies that are preliminary and subject to further revisions. They are being circulated in a limited number of copies only for purposes of soliciting comments and suggestions for further refinements. The studies under the Series are unedited and unreviewed. The views and opinions expressed are those of the author(s) and do not necessarily reflect those of the Institute. Not for quotation without permission from the author(s) and the Institute.

CONTACT US:

RESEARCH INFORMATION DEPARTMENT
Philippine Institute for Development Studies

18th Floor, Three Cyberpod Centris - North Tower
EDSA corner Quezon Avenue, Quezon City, Philippines

publications@mail.pids.gov.ph
(+632) 8877-4000

<https://www.pids.gov.ph>

Policy, Institutional, and Expenditure Review of Bottom-up Approach Disaster Risk Reduction and Management

Sonny N. Domingo
Arvie Joy A. Manejar

PHILIPPINE INSTITUTE FOR DEVELOPMENT STUDIES

January 2021

Abstract

Republic Act (RA) 10121, or the Philippine Disaster Risk Reduction Management (DRRM) Act of 2010, has led to the passing of complementary legislation and functional policy, bureaucratic and institutional augmentations and directed government budgeting and spending. Key thematic mandates were given to NGAs, while the bulk of policy implementation, institutional grounding, and resource allocation related to DRRM were devolved to local government units, granting them fiscal and administrative authority. The policy also facilitated opportunities and invitations for participatory bottom-up approaches, but gaps existed on structured reporting and appraisal of DRRM budget and spending, and bottom-up participation. This study added to the discourse by looking at the status and trends of public investment and policy initiatives, and bottom-up and participatory mechanisms. Using mixed-methods, qualitative inputs from KIIs and FGDs and quantitative data encoded from the DILG-Full Disclosure Policy Portal (FDPP) 2015-2019 were used to provide evidence and establish narratives on how policy, institutional structures, and public investment contributed to LGU functioning and community preparedness and participation. It was found out that there were sub-optimal allocations despite the abundance of fiscal resource in both national and subnational governments regardless of location and income levels, the highest utilization rate for which were identified in disadvantaged regions (ARMM, Region 3, Region 9). The low utilization rates were largely attributed to unclear issuances from oversight agencies or spending preferences of local administrations. As the predominant arrangement across DRRM landscape was still top-down, communities have much to lose due to their weak visibility in participatory governance and nearly invisible decision-making powers in the formulation of plans and approval of programs. While community resilience was stated to be the core of RA 10121, institutional structures still needed strengthen their enabling mechanisms for representation and stakeholder participation; expenditures should explicitly support more community-led initiatives as well as proposals from sectoral committees, and barangay councils; and monitoring and evaluation strategies should be able to capture and track accurately DRRM funds, goods and services, across agencies, fund sources, and varying enabling conditions.

Keywords: disasters, public investment, policy framework, institutional structures, community, bottom-up approach, participatory

Table of Contents

1.	Introduction.....	5
1.1.	Background of the study	5
1.2.	Objectives.....	6
1.3.	Policy questions.....	6
2.	Review of Related Literature.....	6
2.1.	Government's role in disaster management.....	6
2.2.	Approaches employed for DRRM public investment	7
2.3.	Bottom-up and participatory approaches	7
2.4.	Emerging challenges	8
3.	Methodology	8
3.1.	Conceptual framework.....	8
3.2.	Data gathering and analysis	9
4.	Results and discussion.....	9
4.1.	Policy.....	9
4.2.	Institutional avenues for participation	10
4.3.	The role of the people.....	11
4.4.	Public investment.....	13
4.5.	Key insights	27
5.	Conclusion and recommendations	28
6.	References	29

List of Tables

Table 1. Summary of receipts, utilization, and balances as of 2018.....	26
---	----

List of Figures

Figure 1. Public investment for DRR framework.....	8
Figure 2. Data collection requirement.....	9
Figure 3. Evolution of disaster management paradigm in the Philippines.....	10
Figure 4. Framework of ECOWEB and dimensions of community governance.....	12
Figure 5. National DRRM funds.....	14
Figure 6. Grants and loans under Official Development Assistance.....	15
Figure 7. Funding process among local government units.....	16
Figure 8. Average allocation and utilization of various DRRM fund sources, 2015-2019.....	18
Figure 9. Average allocation and utilization per fund source, region, and year.....	20
Figure 10. Regions relative position to their allocated vis-à-vis utilized funds.....	21
Figure 11. Utilization rates vis-à-vis proportion of unutilized to allocated funds.....	21
Figure 12. Utilization and non-utilization rates across fund sources and over the years.....	22
Figure 13. Spending patterns of municipal and city local governments.....	23

Policy, institutional, and expenditure review of bottom-up approach disaster risk reduction and management

Sonny N. Domingo and Arvie Joy A. Manejar¹

1. Introduction

1.1. Background of the study

The Philippines is a country exposed to various disasters, owing to its geographical location along the Ring of Fire and further compounded by risk factors like poverty. Over the years, the country has evolved and shifted its disaster management paradigms albeit a little later compared to the global timeline which gave rise to the Republic Act No. 10121 or the Philippine Disaster Risk Reduction and Management Act of 2010. The policy featured four thematic pillars (e.g. prevention and mitigation, preparedness, response, rehabilitation and recovery), formed a multi-stakeholder council, and devolved most functions to the local governments. It also mandated the need to have national and local disaster risk reduction and management plans which were ultimately advised by national agencies to be streamlined in the larger, local development plans.

The policy placed both national and subnational government bodies at the core of disaster management, and their roles demanded several expectations from them such as to lay out policy landscape, mobilize resources, and engage stakeholders, mitigate damages and loss, ensure community preparedness, facilitate disaster response, safeguard livelihoods, and business continuity, rebuild and rehabilitate post-disaster, incentivize apt action and behavior, and ensure optimal public investment (Subbiah, Bildan, & Narasimhan 2008; Sawada & Takasaki 2017).

The same landmark legislation provided structure and substance to the devolved DRRM-related functions of local government units. The institutional machinations at the subnational levels largely mirrored national level structures while keeping community resilience at their functional core. Engagement with constituents were implied to come in through consultations during formulation of DRRM plans but remained ambiguous in the matters of identifying priority programs and projects. It was definite however that the combined provisions of the Local Government Code and the National DRRM act were able to provide LGUs the opportunity to have fiscal and administrative authority to ground policy, craft and enabling environment for local initiatives, and bottom-up participation among community constituents.

Funds were specified particularly for DRRM within the salient provisions in the policy and later in the subsequent circulars of budget agencies to meet these functions. Possible avenues for fiscal augmentations were likewise identified as precedent in case of resource limitations, but accessibility to these remained to be discussed. Proper public investment together with nudging of institutions towards achievement of DRRM goals may facilitate mitigation of risks and vulnerabilities, and convert people and communities from passive spectators to active partners in all the thematic pillars.

Given the above, the study reviewed the policy, institutional, and public investment aspects of the study and how they play in facilitating participatory and bottom-up approaches at the national and local levels.

¹ Senior Research Fellow and Research Analyst II respectively, at the Philippine Institute for Development Studies

1.2. Objectives

Generally, the study aimed to review the policy, institutional, and public investment aspects of disaster risk reduction and management in the Philippines and how they facilitate bottom-up and participatory approaches.

Specifically, the study sought to:

1. Back-map DRRM-related budget and expenditure at the national and subnational levels using reports from the full-disclosure portal of the DILG;
2. Assess DRRM public investment trends, fund allocation mechanisms, and policy priorities;
3. Review the policy and institutional framework supporting bottom-up disaster risk reduction and management in select LGUs; and
4. Recommend ways to address gaps and strengthen bottom-up approach mechanisms.

1.3. Policy questions

This study used a three-pronged component approach divided among policy, institutions, and public investment. Given the fund structure in the DRRM landscape in both national and local landscape, it was vital to learn the spending patterns of national and local governments over the years and how this affected their DRRM mechanisms. Similarly, the review also allowed for probing on the policy and institutional gaps that limit the appraisal of relevant and necessary DRRM resources. Then, finally, the review sought to determine whether these components were able to provide an enabling environment for community participation and bottom-up DRRM.

2. Review of Related Literature

2.1. Government's role in disaster management

Governments have this array of roles and functions listed in the national policy for disaster management, and this was a list of heavy expectations in fulfilling multiple components in such landscape – economic, social, environmental. The devolution of policy to localities have carried the assumption that local governments were better equipped to identify their needs, but given the limited resources available, they should be able to pinpoint the “most effective forms of aid that would have the biggest impact on vulnerable members of the community” (Francisco 2014, p.1).

Investments in the pre-disaster phase were hypothesized to be the best interventions to reinforce the peoples' capacity and resilience against disasters however, literature was heavily imbued with studies on post-disaster recovery and response as they were found to be critical in allowing the affected population to resume their regular lives. Nonetheless, public investment has the advantage of being able to spread risks and smoothen economic shocks across temporal distances (Ye et al. 2013).

It was important to look at how resources are being utilized to address and/or mitigate disaster damages, and whether these financial resources were solely shouldered by government treasury, or filled in by loans and grants from external funds or obtained from other sources.

A government system with strong community awareness and participation was more likely to listen to community-based suggestions in response to mitigating losses on the ground compared to governments with weaker citizen response (Subbiah, Bildan, & Narasimhan 2008).

2.2. *Approaches employed for DRRM public investment*

Public investment in disaster risk reduction and management is often spread over two phases: pre- and post-disaster. In the context of the Philippines, under RA 10121, mitigation, prevention and preparedness make up the first phase, while disaster response, and recovery and rehabilitation make up the second phase. The literature often contests the allocation of funds between these phases with governments often playing a balancing act in fund allocation.

The proportion spent on prevention and mitigation has always been a point of contention; if the budget is set too low, it may not be effective in carrying out preventive measures and if it is set too high, there is the argument of ignoring other expenditures, facilitating crowding out effect, and hence, putting the economy in a stale (Benalia et al. 2016). While increasing the public investment in disaster risk reduction may deliver great returns, the extent of the investment may be affected by the state budget and the current administrations' priorities. "To be more specific, low-income countries have higher opportunity costs for disaster prevention than middle- and high-income countries, and thus the scale of government's investment in disaster risk reduction is relatively small." (Wu et al. 2020, p.2). Other challenges in over-investing in disaster risk reduction is the increased dependence of the residents on government assistance and decreased initiative from the people to commit and transfer risks.

Early warning systems (EWS), for example, fall under disaster preparedness. It is a capital investment which significantly reduces damages and casualties. In Subbiah, Bildan & Narasimhan's 2008 study, they clustered several countries into four groups, and they observed these case studies in relation to their establishment of early warning systems. The Philippines was placed in Group 2, together with Bangladesh, Mongolia, Mozambique, Pakistan, and Vietnam, and were identified as countries with compromised EWS due to limited resources. A case in point was Marikina – while they invested in a flood warning system, a majority of the city's households still relied on word of mouth for information (Francisco 2014).

2.3. *Bottom-up and participatory approaches*

Lessons from the history of political systems attest that there should be a balance in the rights and decision-making powers between central and decentralized government units since not every decision should be taken at local level. While decentralization is a long-term, non-linear process, its success depends on three major determinants namely, framework, competence and willingness, and financial management capacity. In the case of the Philippines, the framework is provided for by RA 7160; since it is a national policy, its legitimacy and implementation are insulated from rebuttals and political oppositions. The decentralized setting is also believed to be more appropriate for the interface between local officials and people – facilitating for easier accountability and a wider platform for participation. The third determinant has proven to be critical as it was already observed from decades of decentralization that devolving tasks and responsibilities to the local level without fiscal devolution will only lead to local budget deficits and increased dependence on national budget allocation decisions.

Lessened vulnerabilities are also attained when local and municipal decision-makers get a grasp of the coping and adaptation mechanisms of the communities when it comes to hazards (Rivera & Vargas 2018). Responses and strategies employed by community groups can also

help shape local disaster plans – much more so if there is an existing intellectual bank of indigenous knowledge and practices that have been proven effective through a series of collective experiences. Such is the importance for treating local knowledge as valid responses to hazards and disasters, and the mainstreaming of these in local plans allow for the internalization of ownership and stewardship among the residents (Florano, 2014). The presence of community-based organizations also increased during the times of disaster when government assistance and response are noticeably absent on the ground (Brower, Magno, & Dilling 2014).

2.4. *Emerging challenges*

A critical shortcoming in the public investment of the country is the absence of proper monitoring and evaluation of DRRM-related investments. Reporting of expenditures remained entirely dependent on the submission to DILG’s Full Disclosure Portal, but capturing all investments that spill over in other fund sources or in funding components of other programs (e.g. Climate Change Expenditure Tagging) has proven to be quite difficult.

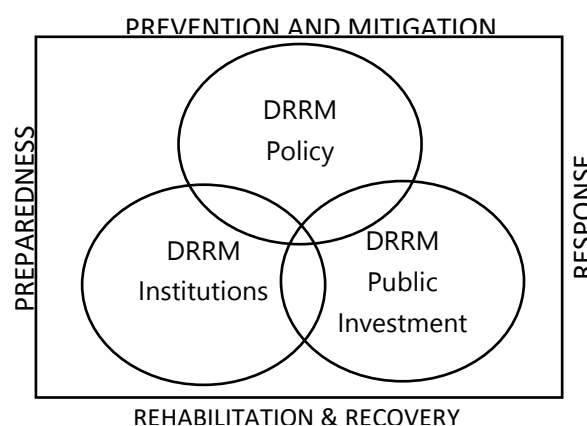
3. Methodology

3.1. *Conceptual framework*

Patterned from the UNDP climate change public expenditure and institutional review (2015), the methodological approach for the study have three key pillars: Policy Analysis, Institutional Analysis and Climate Public Expenditure Analysis (Figure 1). Policy analysis covered a review of the disaster risk reduction policy and its monitoring framework. Institutional analysis looked into the roles and responsibilities of institutions and their capacities in formulating, implementing, and coordinating climate responses. Public expenditure analysis quantified the DRRM-related expenditure out of the total national budget and assessed relevant fiscal policies and financing instruments.

The study scoped the government expenditures as reflected in the national budget and local government appropriations. Departmental budgets detailed in the annual General Appropriations Act, and local government spending as reflected in the local development plans and annual investment plans and submitted financial reports were reviewed. The framework determined whether the instituted policy at the national and subnational levels are enough to promote and/or mainstream appropriate community participation strategies for an effective bottom-up approach to DRRM.

Figure 1. Public investment for DRR framework



Source: Authors’ illustration

3.2. *Data gathering and analysis*

Mixed-methods approach was used for the study. Desk review of available documents were conducted, including expenditure reports to DILG and COA, annual general appropriations act, and Official Development Assistance Funds. Local DRRM Fund utilization reports spanned 2015 to 2019 and were encoded from September to December. These were then subjected to quantitative analysis through R Studio.

Key informant interviews and focus group discussions with NGOs and DRRM practitioners within local governments were conducted through the Webex platform. These were supplemented with literature review on participatory approaches to DRRM.

The inputs of the study are the components of the national policies and frameworks which are in turn processed through the functions of BDRRMC in each identified thematic area. This research paradigm is a feedback loop resembling a trial and error for the success of the policy, resembling a trial and error for the success of the policy. It also signifies whether the existing policy on disaster management should be amended.

Figure 2. Data collection requirement

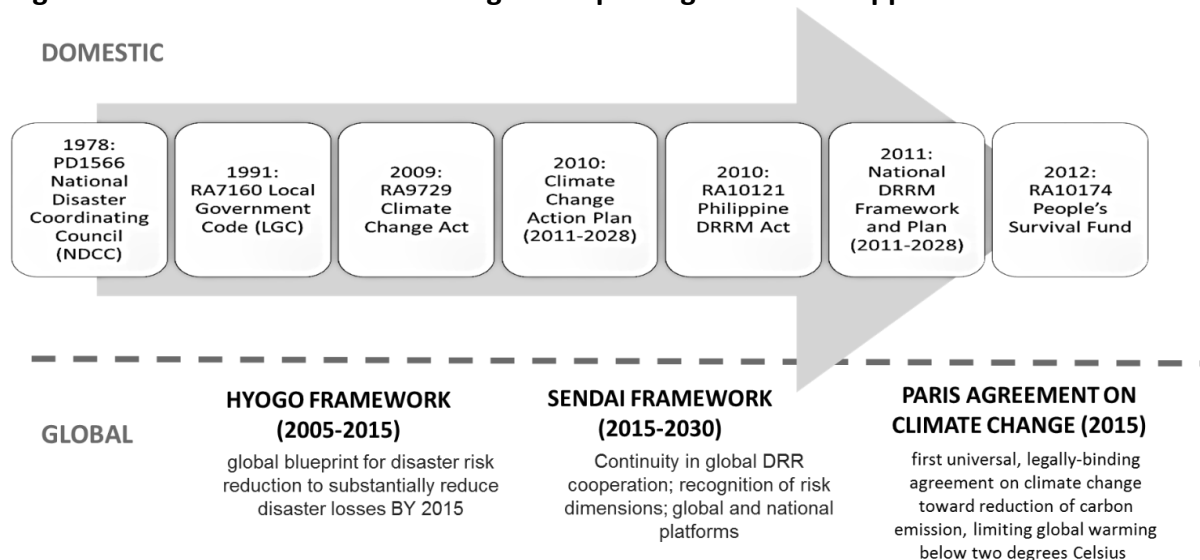


4. Results and discussion

4.1. *Policy*

The disaster management framework of the country initially started dealing with disasters as emergencies with the efforts centralized in the national government. In 1991, there was a semblance of devolution through the Local Government Code (RA 7160) wherein local governments can utilize five percent of their estimated revenue from regular sources during calamities. Following this, the idea of disasters started becoming more multifaceted, branching out from immediate response to long-term rehabilitation, sustainable development, poverty reduction, and good governance. This shift was reflected in the subscription of the Philippines to international agreements and the adoption of national climate policies (Climate Change Act, Clean Air Act, Clean Water Act). Then, finally, the RA 10121 was passed in 2010, retaining some centralized functions but mostly devolved to local functions (COA nd).

Figure 3. Evolution of disaster management paradigm in the Philippines



Source: Authors' illustration

Section 6a of Republic Act 10121 described the policy as a “comprehensive, all hazards, multisectoral, interagency and community-based approach” to DRRM. Its major blueprints were the National DRRM Plan and the National DRRM Framework which eventually served as patterns to local disaster plans. These were formed under the direction of the National DRRM Council and the monitoring of the Office of Civil Defense.

While serving as guidance to local governments, the national documents also served as countercheck to the alignment and streamlining of all planning papers. DILG imposed this further by releasing a memorandum circular in 2014, forcing LGUs to integrate local DRRM and climate change action plans and update their comprehensive land use and development plans. It highlighted the need to reflect hazards and risks in their respective localities and plan their development around these. The fiscal component followed suit, releasing a joint memorandum on detailed allocation and utilization guidelines of local disaster funds.

Indications of participatory engagement may not be fully visible in the policies mentioned from the onset of the 90s and fully into the 2000s, but it eventually found semblance of such arrangement in some pocket provisions within the Philippine Development Plan, Strategic National Action Plan, HFA, and particularly in RA 10121.

4.2. Institutional avenues for participation

Staying close to its community-based pronouncement, the policy established institutions and structures for DRRM within the bureaucracy that could also become vehicles of opportunities for participation from the ground up. At the helm of implementation was the multistakeholder organization, National Disaster Risk Reduction and Management Council (NDRRMC), which chaired by the Secretary of National Defense. The thematic four pillars have corresponding vice-chairpersons, DOST for prevention and mitigation, DILG for preparedness, DSWD for response, and NEDA for rehabilitation and recovery. At most four civil society organizations can join the council along with one private entity. Representation especially among the communities was welcome as these same structures were replicated to regional, provincial, municipal, city and barangay levels.

Unfortunately, the vice-chairs of the subcomponents of NDRRM Policy did not have equivalent departments beyond the regional level. Some LGUs like Carmona in Cavite adapted by identifying stand-ins – MENRO handled prevention and mitigation, preparedness by municipal administrator, emergency response by the LDRRMO and engineering office while MPDO oversaw rehabilitation and recovery. This arrangement better delineated the tasks in their locality and facilitated in the assumption of immediate responsibilities. In the case of Cotabato, they formed humanitarian teams and a network of DRRM offices from all barangays for quicker consolidation of plans and information blasts.

The mandated local DRRM offices were supposedly comprised of at least three staff, with standing list of responsibilities akin to NDRRMC notwithstanding creating local DRRM plans, establishing early warning systems and operation centers, coordinating across sectors, conducting trainings, and submitting expenditure reports. This arrangement was based on the rationale that local governments were most effective in mobilizing within their jurisdictions and that they would identify best the needs of their constituents.

However, this would still be affected by inherent nature of political systems in the country, under which was the discussion for the contention on designation of a local DRRM officer. Narratives reportedly described it in two ways – by hire or by co-terminus appointment of the LCE². It may not end there as the LDRRMO may also be the head of other departments (usually MENRO³ or PIO⁴), not only jeopardizing the distribution of resources but also the focus on mechanisms. The next concern would be the number and capacities of staff as their roles would entail numerous technical skills e.g. hazard maps, development plans, risk assessments. The limited manpower is compounded with the lack of technical skills which are sometimes bridged by national agencies but more so by non-government organizations. There were cases, however, when these human capital investments fell short and were not sustained in the long run due to the fast turnover of employees.

LDRRMOs were also expected to manage field and data gathering as these were the foundations of their plans and such was their need for comprehensive datasets like CBMS and Listahanan. One unique case for this community accounting was Cotabato as their borders traversed across the Bangsamoro Autonomous Region in Muslim Mindanao. The locality was riddled with various risks not only with natural hazards as a catch basin but as well as human-induced incidents. The overlaying of problems offered challenges in identifying constituents, conducting rescue operations, and face-to-face monitoring. For instance, National People's Army (NPA) and Moro Islamic Liberation Front (MILF) have camps within the confines of Cotabato. There were also datu communities within the locality, but they were not considered as legitimate political institutions, implying that their indigenous knowledge, systems and practices may not have been taken up in upper governance structures.

4.3. The role of the people

At the base of all these institutions were the barangays, the households, and the people. They made up the ground-level community and were the ones who were immediately hit by disasters. The passage of Republic Act No. 10121 was seen to facilitate the establishment of community-based disaster risk management given community resiliency as its core. Literature defined this

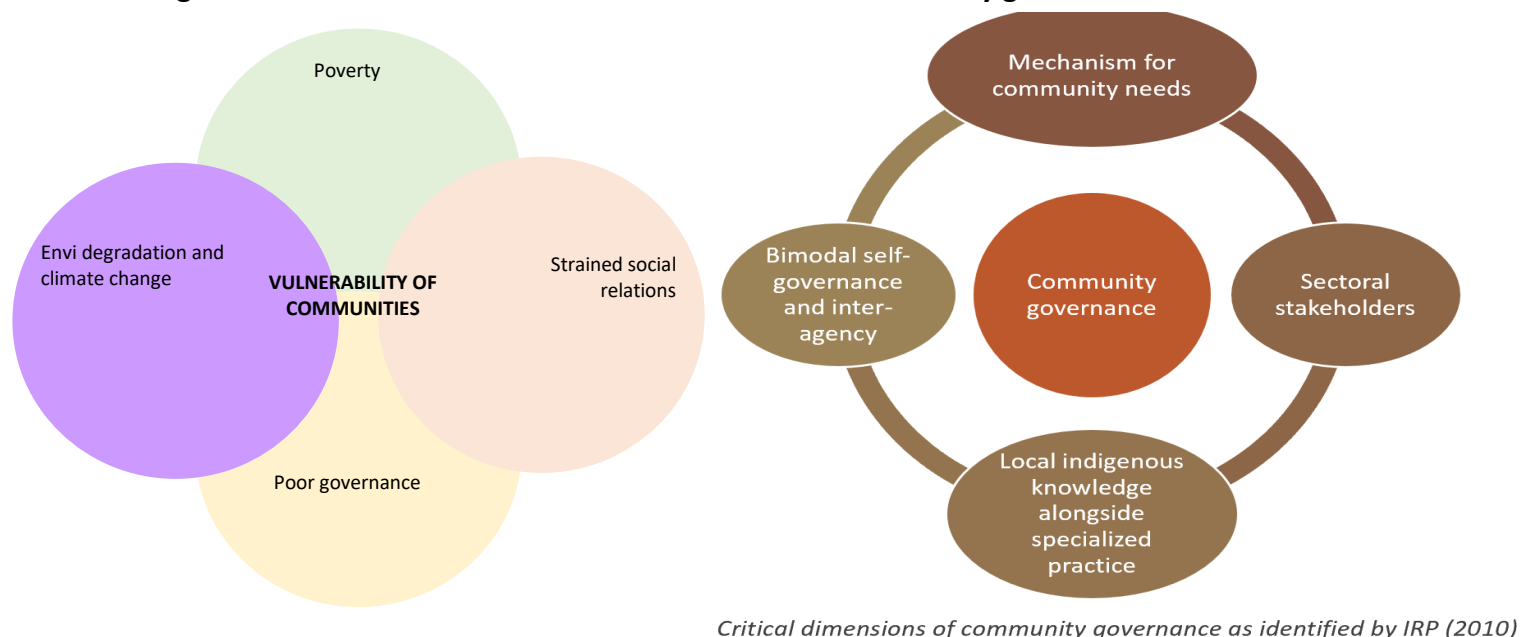
² Local chief executive, mayor. This refers to a head of a local government unit in either municipal or city level.

³ Municipal Environment and Natural Resources Office

⁴ Public Information Office

approach loosely, in many terms, and sometimes interchanging, but features resembled each other. Kaiser (2012) described local community participation as having ensured ownership, commitment, and accountability in initiatives and ultimately, governance. This extended as well in their power to decide, to identify their goals, and to work on their achievement as an organized body within the policy (Totikidis et al. 2005, IRP 2010, Jalali 2002, Post 1997). ECOWEB, a non-government organization known for their community-based DRRM work, based their programs on Human-Ecosystems Development Framework wherein humans were considered part of the ecosystem and not just a mere external influence to the natural systems. The framework highlighted the role of the people in shaping the management and physical development of their surrounding environment which would ultimately affect them as well. The paradigm for this framework consisted of different levels with households at the bottom, followed by groups and organizations, institutions, society, and then the ecosystem at the top, and avenues for integration could be made vertically and/or horizontally. They followed the assumption that if multifaceted root causes are not addressed together, vulnerabilities will continue and challenges will remain compounded. The approach gained a steady following since its inception, owing to its benefits – lessening vulnerabilities, shaping better plans, empowering communities, and enhancing checks and balances.

Figure 4. Framework of ECOWEB and dimensions of community governance



Critical dimensions of community governance as identified by IRP (2010)

Source: ECOWEB n.d. & IRP 2010

The next direction then would be to identify avenues for participation within the already formed structures. In the organizational charts from the region down to the barangays, the people can be properly represented by civil CSOs and sectoral groups and committees which can better leverage their interests as well as bring up their needs in development discussions. Representation can also provide them opportunities to participate in formulation of plans, allocation of resources, and identifying of priority PPAs. In fact, barangay DRRM and development plans were some of the main instruments for community contributions to be taken up, but rarely do they fly through in terms of alignment.

This study's informants have identified some of these groups as women, persons with disabilities, family health workers, children, and farmers among others, but despite their inherent structural disadvantages, they could be great partners in the disaster management

landscape. They could act as conduits for faster dissemination among the community, instilling community awareness and consciousness which were important factors for the sustainability of initiatives, and they could mobilize as response clusters like in the case of Alerto Antipolo during disasters. These capacities would likewise empower them as well.

However, community-based and participatory approach may not be all that good. Delica-Willison & Gaillard (2012, p. 721) stated that real community participation may be easy to understand and get across but could also be most difficult to implement. Too many actors in a decision-making body may also muddle the efficiency of decision-making, one of the reasons why the DRRM landscape was still largely characterized with a top-down approach. Community initiatives would only emerge if there were no government actions. Hence, an enabling political environment could be conducive for community participation and for the sustainability of their initiatives (Perez 2008).

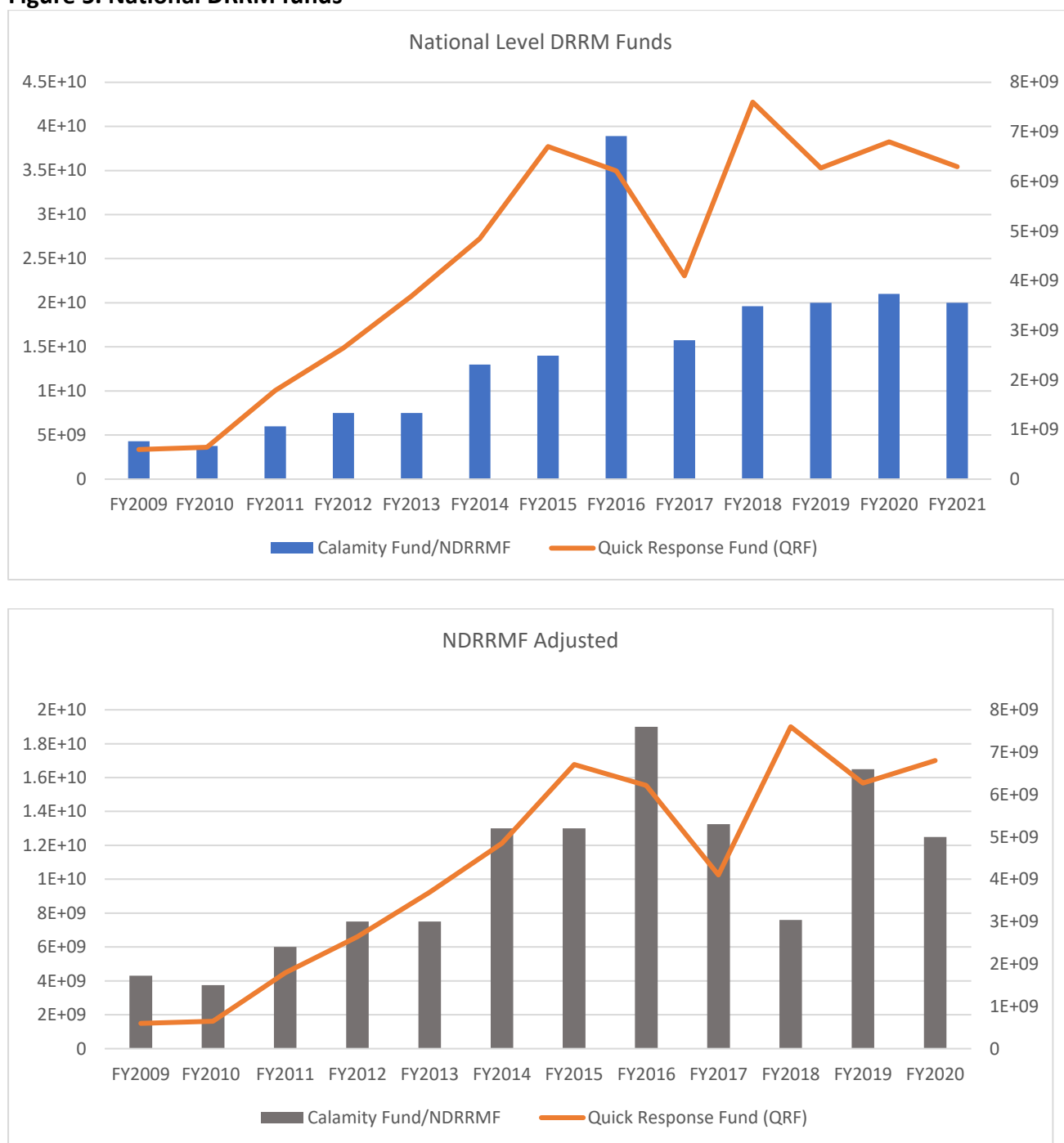
4.4. Public investment

4.4.1. National disaster funds

One of the factors that could shape this environment would be public investment, and RA 10121 identified multiple sources. In the national level, NGAs have been allocated five percent (5%) national DRRM fund, also called calamity fund, from the annual general appropriations. They may also augment these with official development assistance (ODA) which can either be grant or loan from external agencies like the Asian Development Bank, UNDP, and World Bank.

Starting FY 2012, quick response funds allocations were lodged against respective budgets of the national departments. In 2015, this accumulated to Php 1 billion for peoples survival fund (PSF), but accessing this would be decided through applications. The same amount was still visible in the following year, but Yoland rehabilitation was allocated a large chunk amounting to Php 18.8 billion. The PSF was absent in 2017, but funds were allocated for insurance and rehabilitation. Funds became bigger in 2018 due to the Marawi siege, a human-induced disaster that gravely affected the Mindanao regions. Php 10 billion were allocated for response and rehabilitation purposes within Marawi while Php 2 billion were for insurance. Augmentation continued until 2019 when they supplemented another Php 3.5 billion for Marawi, and Php 3 billion for quick response funds. For 2020 so far, what was visible was the continued allocation for Marawi and earthquake fiscal assistance for Regions 11 and 12. It should be noted that, at the very least, in the national level, there were allocations given for insurance.

Figure 5. National DRRM funds

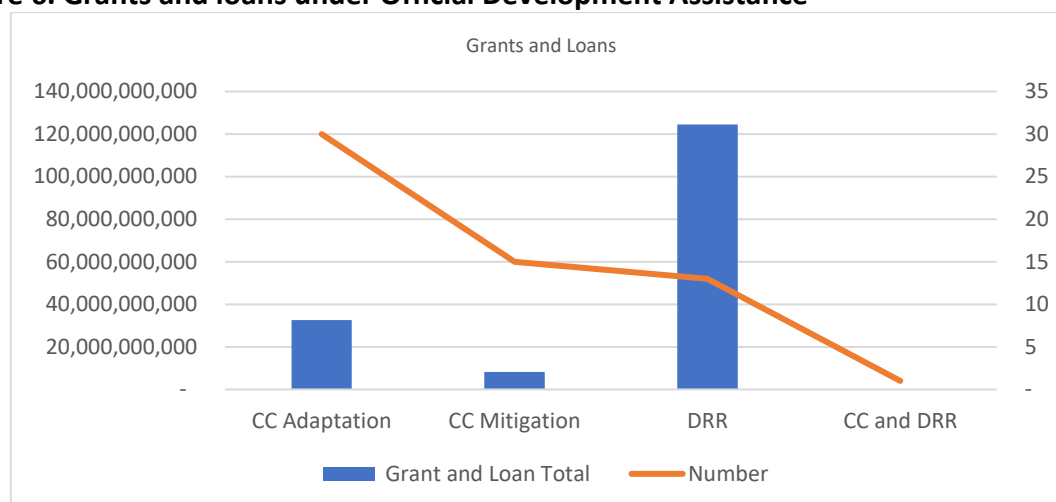


Source: Authors' calculations

When disaggregated further among institutions, the biggest cumulative allocations for QRF went to the Department of Social Welfare and Development (DSWD) which was expected as they oversaw relief operations and response after the disaster. They were followed by the Department of Education (DepEd), and Department of Public Works and Highways (DPWH), notably for their repair work in damaged road infrastructures.

Fiscal augmentation from ODA sources was channeled mostly for climate change adaptation programs. The largest amount for loans were tagged against DRRM projects while grants have been directed towards climate change mitigation.

Figure 6. Grants and loans under Official Development Assistance



Source: NEDA 2020

4.4.2. Local government funds

In the subnational level, the fiscal resources for DRRM were many but not as straightforward in their usage. Like NGAs, local governments have their five percent (5%) local DRRM Fund (LDRRMF) from estimated revenues from regular sources during calamities, 70 percent of which was confined for the usage of mitigation funds while the 30 percent was reserved for quick response funds. The former should only be programmed for activities indicated in the investment plan and could be used for capital outlay for infrastructure, but the latter can only be tapped for relief and response if the locality or area was declared under a state of calamity. If there were unexpended LDRRMF, this would be transferred to special trust funds which could be used for DRRM activities for the next five years, but if this pool would remain unexpended, the fund will revert to general fund, allowing the LGU to use it for non-DRRM programs (Bueza 2014). In some cases, LGUs were able to tap into their 20 percent local development fund to finance other DRRM programs.

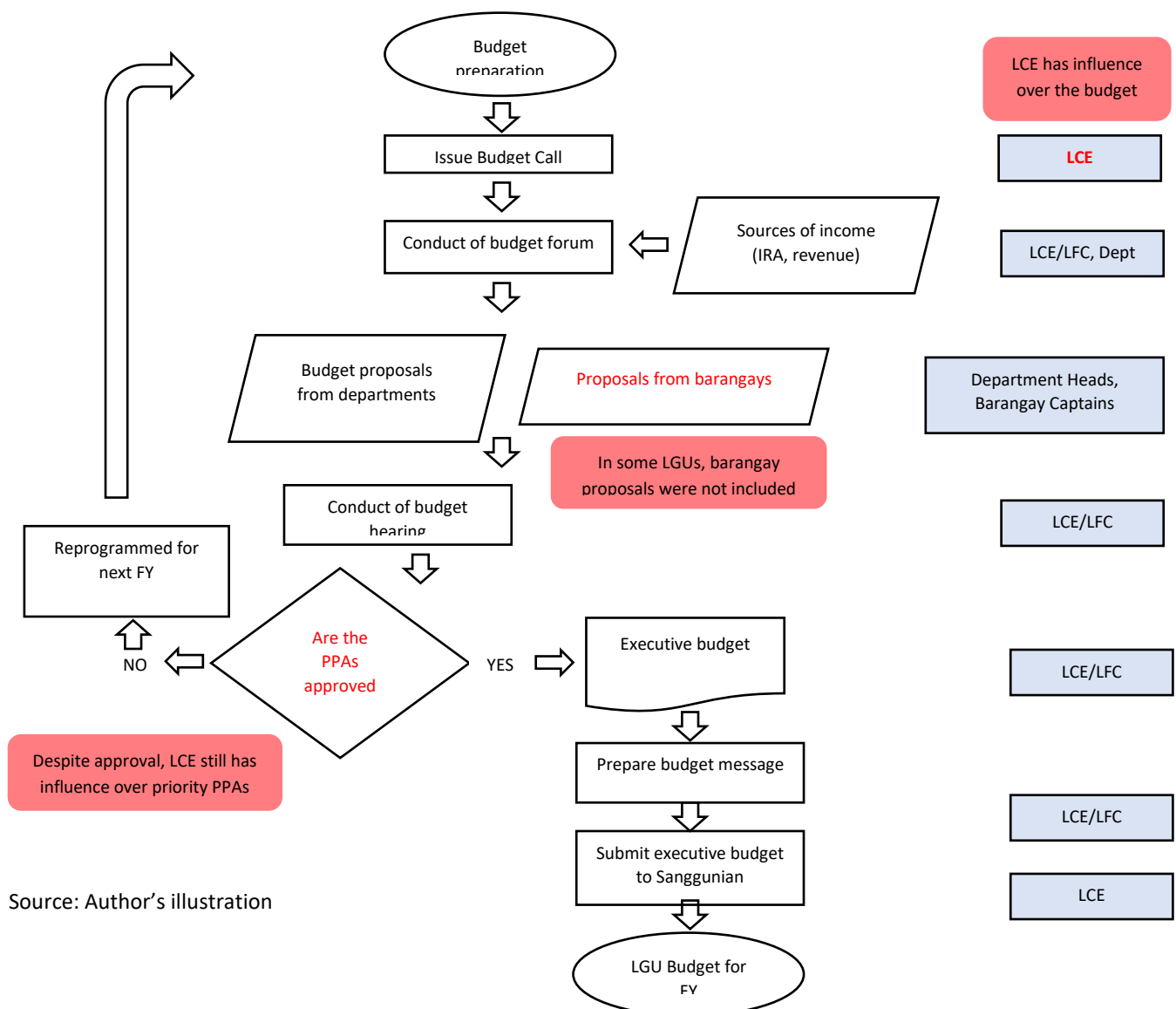
It was also mentioned earlier in the salient provisions of RA 10121 that LDRRMCs may choose to transfer LDRRMF to other LDRRMCs under a state of calamity. This was not as common on the ground, however. It was observed that there is a great disparity between high and low income communities, that the five percent of a million and the five percent of a hundred thousand is different. Those in the former condition tend to not utilize their surplus which is needed by other LGUs, thus emerges an equity concern. One road to follow here is to provide enough flexibility for LDRRMCs to maneuver and aid in resource augmentation of nearby LGUs.

Such was the case this year in light of the COVID19 pandemic. When the whole Philippines was declared under the state of calamity due to the outbreak, the LGUs had the go signal to utilize their QRF and their STF pool from March to end of 2020. Even by this time, there were influx of donations and resource augmentations from the private sector and other external organizations since the fund base among localities was not enough to cover health needs and much more so construct quarantine facilities. The same year, however, the Philippines was hit by three consecutive typhoons in the last quarter – Typhoon Quinta, Supertyphoon Rolly, and Typhoon Ulysses which devastated localities across Luzon.

This is why the funding process and preparations for it is critical; it dictates the approval and direction of programs, projects, and activities allowed for that fiscal year. The funding process starts as early as the year before the actual programming. After the issuance of budget calls, each department are expected to provide proposals and a list of priorities, activities, and programs which would be sourced from their default fund sources. Barangays may submit their proposed investment list to the LDRMO and may suggest PPAs through consultations. Proposals from the different departments are consolidated for a budget hearing presided by the Sangguniang Bayan. If the PPAs are approved, they will be reflected in the LGU budget for the next fiscal year. Otherwise, they can still be reprogrammed.

This process, by itself, has its own limitations that also touch on the extent of bottom-up engagement. The local chief executive is able to largely influence the direction of priorities, especially when it is to ensure the alignment in the executive legislative agenda throughout their term. This approach also hinders the uptake of insights from the ground up, particularly from barangay councils. Then there is a different problem altogether of not inviting DRRM practitioners to the hearing, denying them of the opportunity to clarify their PPAs and discuss the guidelines for allocation.

Figure 7. Funding process among local government units



Source: Author's illustration

The next figures provided an overview of DRRM funds usage across regions. Based on the expenditure reports submitted to DILG, the funds were sourced mainly from LDRRMF, followed by their standby pool fund – STF; NDRRMF, EDF, transfers within and outside LGUs (usually coursed through as donations during calamities), and international sources (possibly loans and grants from external agencies and NGOs). Notice that there were two sets of allocation and utilization. This was to examine the differences in reporting between annual documents and summation from quarterly submissions.

From the graphs, it can be inferred that most of the funding base was still covered by LDRRMF – both the mitigation fund and the QRF, but utilization was less profound for the latter. Biggest allocations were in NCR, Regions 9, 12, and Caraga while high utilization rates were found in NCR, Region 12, and 4A. The seemingly sparse use of QRF can be largely attributed to limitations in accessing this subcomponent. The STF, both the previous and the current pools, were largely untouched. These sources can only be tapped when the LDRRMF has been fully spent, introducing another challenge in widening the fiscal base for DRRM.

Resource augmentations were from NDRRMF (mostly just for the case of Regions 5 and 10), EDF, transfers within LGUs and other sources, and international sources. Zamboanga region particularly made good use of international assistance with its allocation and utilization almost equal. Transfers within LGUs may be a rare arrangement due to the strict compliance to the LDIP, but it does happen e.g. tagging fuel and transportation costs against the general fund while capital outlay (e.g. ambulance, rescue vehicles) were tagged against the LDRRMF. As for the other sources and other LGU transfers, these pertained to forms of cash and in-kind donations.

Figure 8. Average allocation and utilization of various DRRM fund sources, 2015-2019

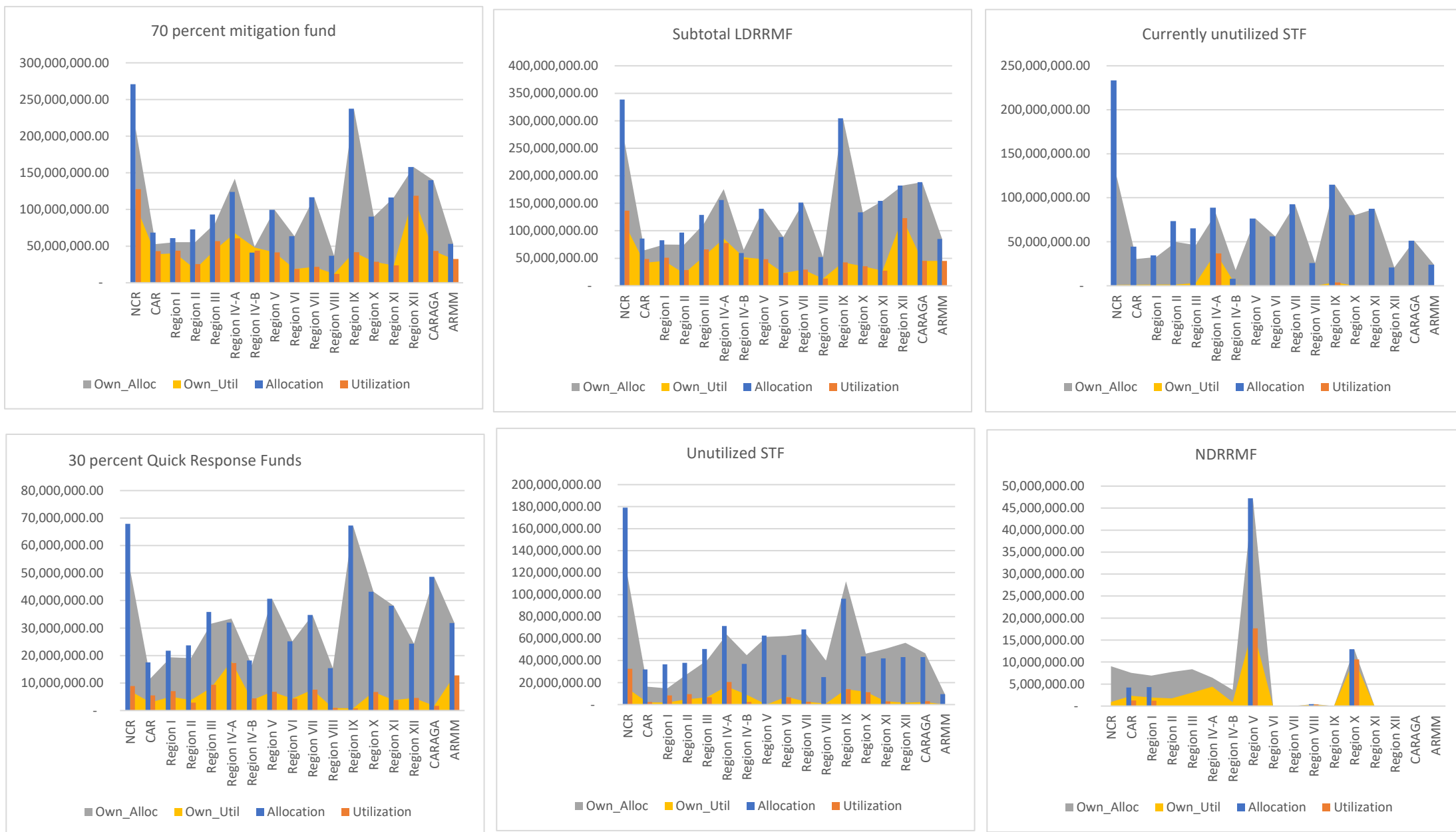
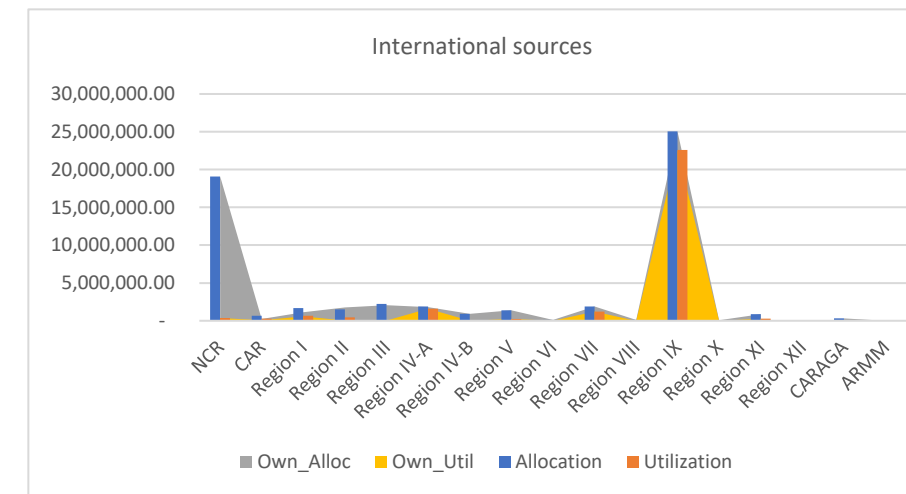
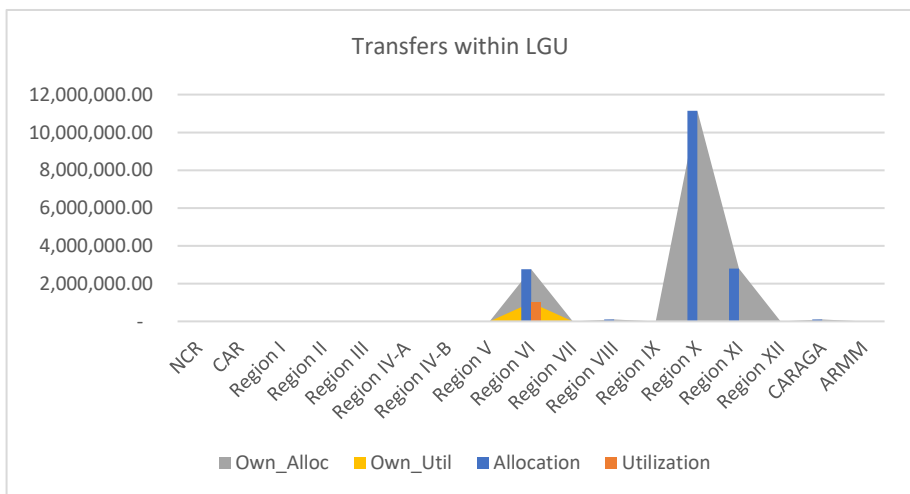
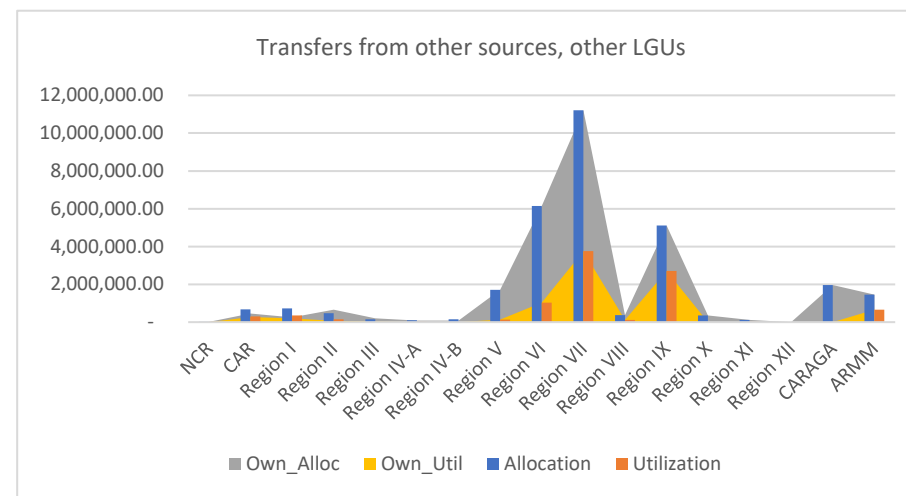
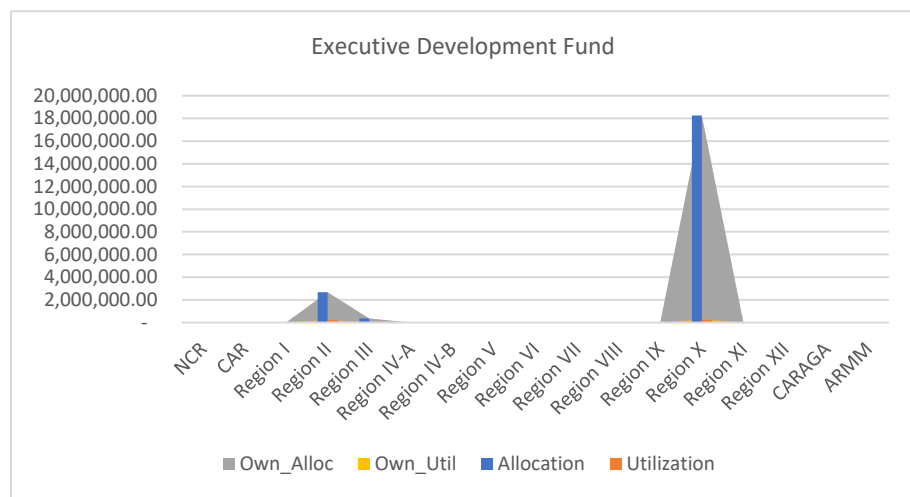


Figure 8. Average allocation and utilization of various DRRM fund sources, 2015-2019 (cont'd)



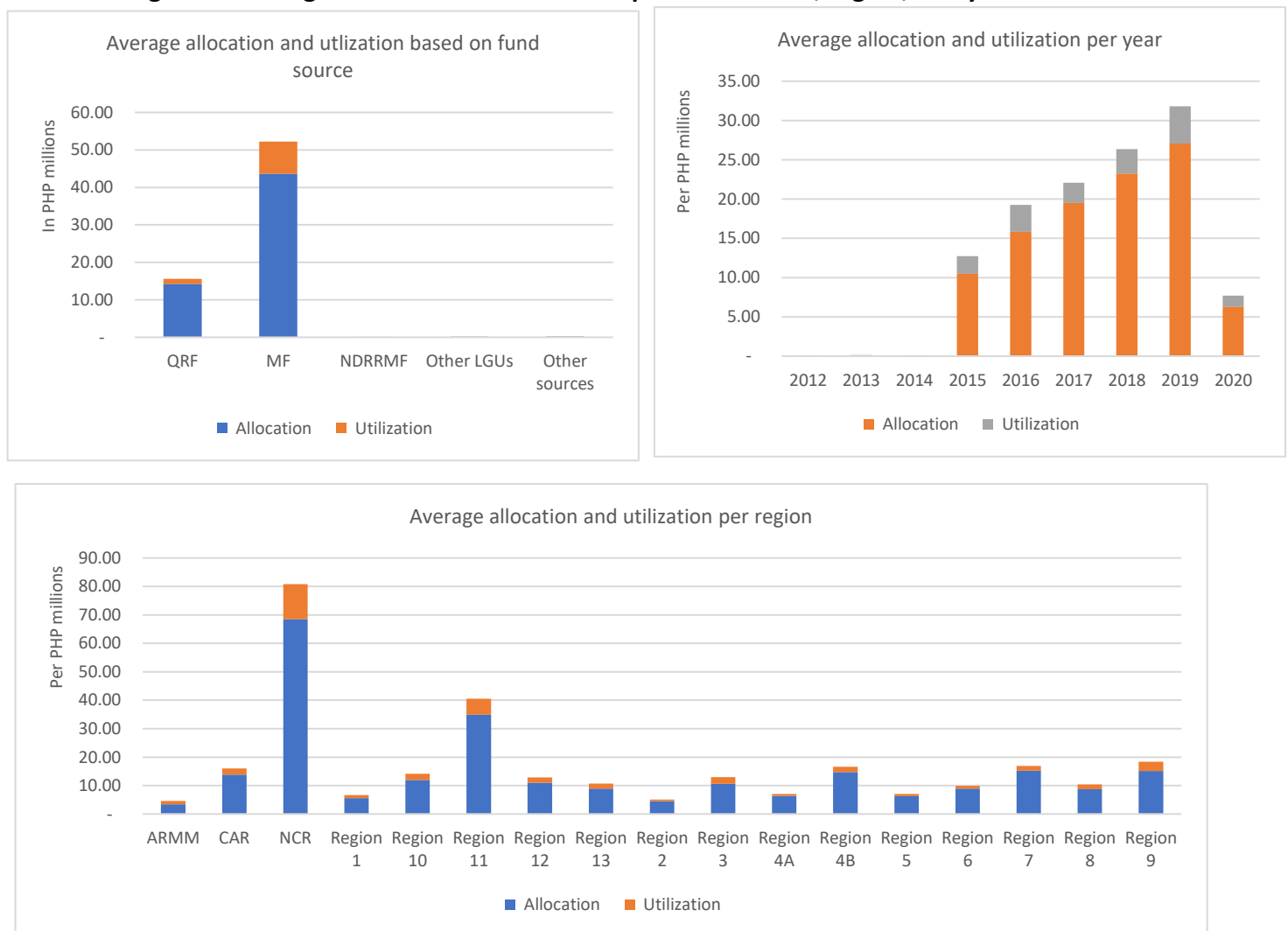
Source: Authors' calculations

Notes: Own_Alloc and Own_Util refer to figures based on sum of quarterly reports while Allocation and Utilization refer to figures of the annual report

The provincial LDRRMF was similar in the breakdown of municipal LDRRMF. The biggest allocations were from the LDRRMF while other fund sources were very negligible. As for the regions, the biggest allocation was found in NCR, followed by Region 11, and Region 9, but the drastic gaps among the regions were very noticeable. On the other hand, LDRRMF and other sources were found to be increasing across the years; figures for 2012-2014 were incomplete in the reports while values for 2020 were only available for up to the second quarter in the DILG archive which would explain their differences.

Low amounts of utilization were very evident in these figures, not even equivalent to half of the allocation, but reports on the ground have consistently brought up the lack of funds in achieving DRRM outcomes.

Figure 9. Average allocation and utilization per fund source, region, and year

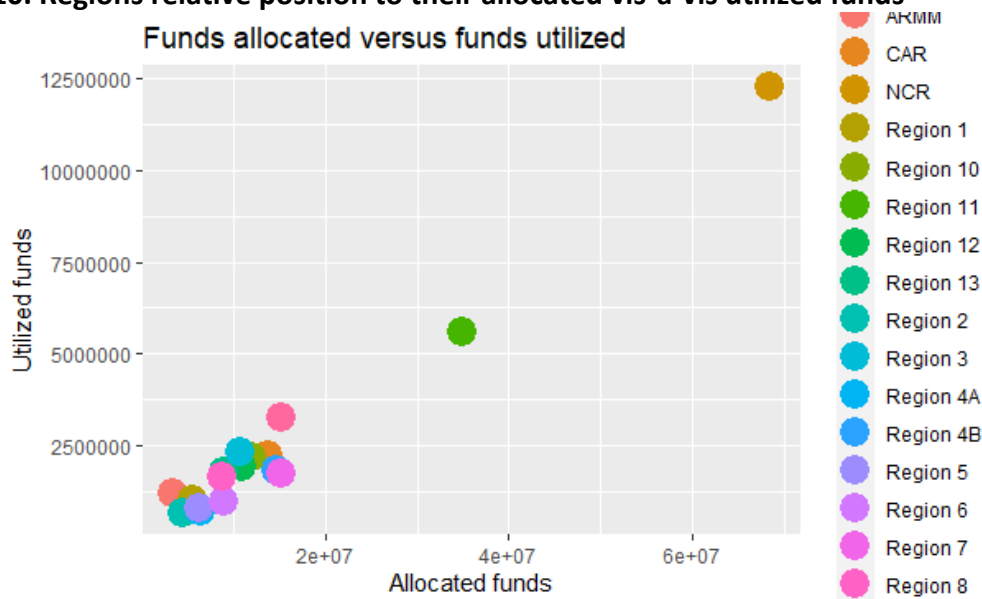


Source: Authors' calculations

The next figure below showed the position of regions relative to their figures of allocation and utilization. NCR was noticeably the outlier as it had high utilization and allocation comparatively to other regions, followed by Region 11. The rest of the regions were far below, having low allocations on DRRM and likewise low utilization values. This simply reechoed the bar graph presented above and highlighting the gap between the most well-endowed regions

in terms of IRA and estimated revenues and those which have average level of fiscal resources and capacities.

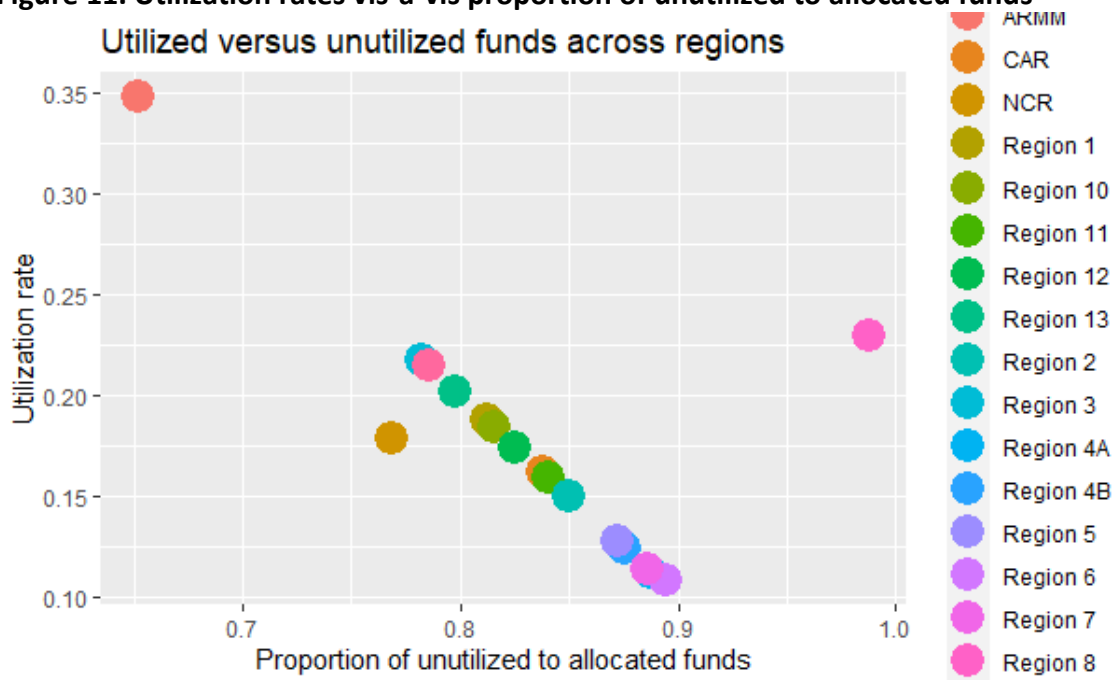
Figure 10. Regions relative position to their allocated vis-à-vis utilized funds

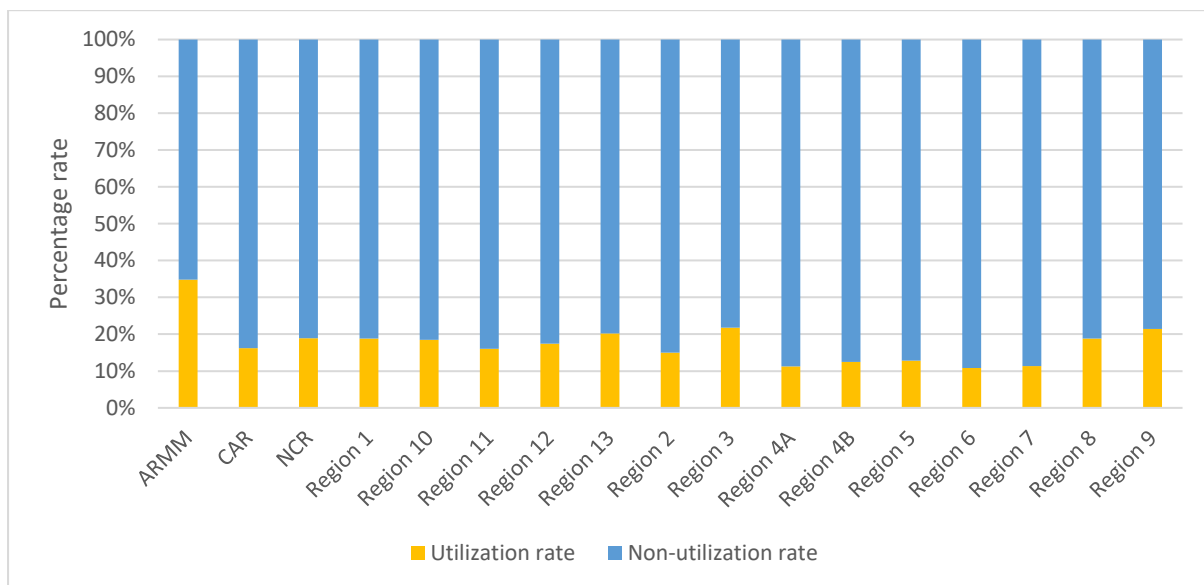


Source: Authors' calculations

However, the landscape for discussion became different when the reference values were utilization and unutilization rates. Despite having the highest allocation and utilization values, NCR actually had low utilization rates. It was ARMM (35 percent) and Regions 9 and 3 which have highest utilization rates, evidence that the most disadvantaged regions were making more optimum use of their DRRM funds.

Figure 11. Utilization rates vis-à-vis proportion of unutilized to allocated funds

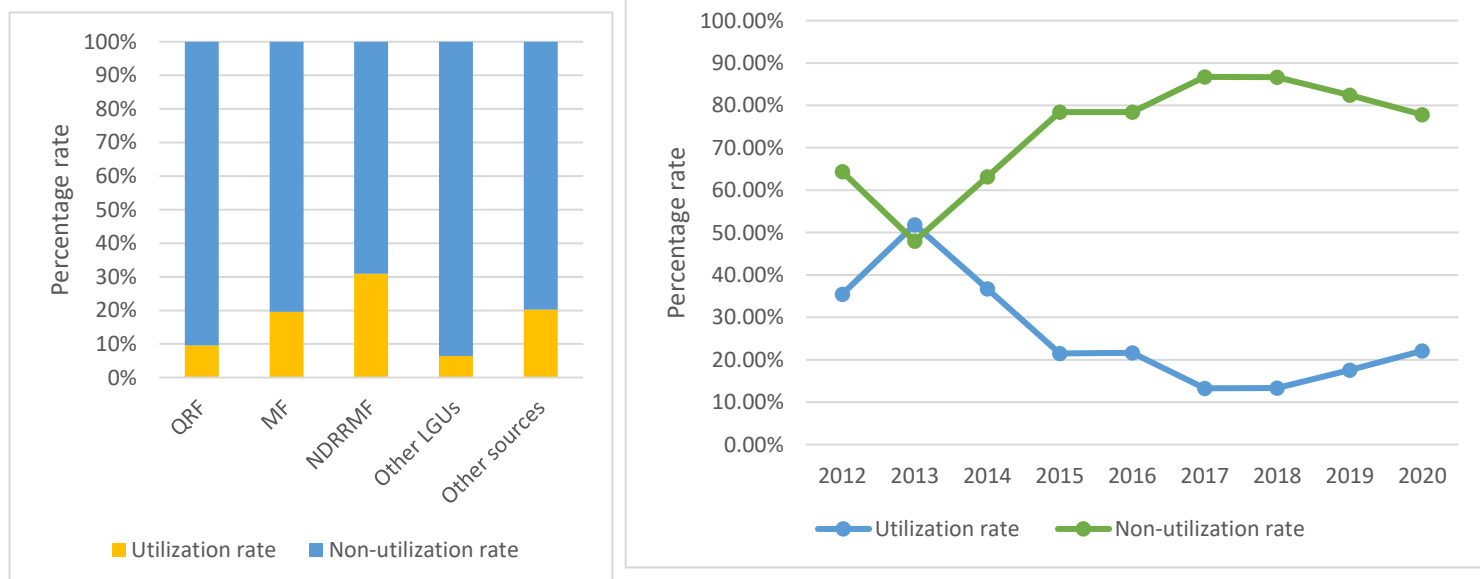




Source: Authors' calculations

Among the fund sources, it was the NDRRMF which have the highest utilization rate, followed by mitigation fund, donations from other sources, and quick response funds. An interesting case can be found in surveying the rates across the years. Normally, the trend would be non-utilization rates were higher than utilization, but in 2013, the year of Yolanda's onslaught, utilization was higher than unutilized funds, subtly referencing the grave impact of the supertyphoon. This trend is similarly converging in 2020 albeit not yet fully formed with only two quarters in. The data would have to reflect expenditures on the Taal Volcano eruption, COVID19 pandemic response and infrastructure (quarantine facilities, testing centers), and the three typhoons in the last quarter of this year that ravaged Northern Luzon. Plotting these expectations would set the utilization values higher than the allocated budget, producing negative unutilized figures.

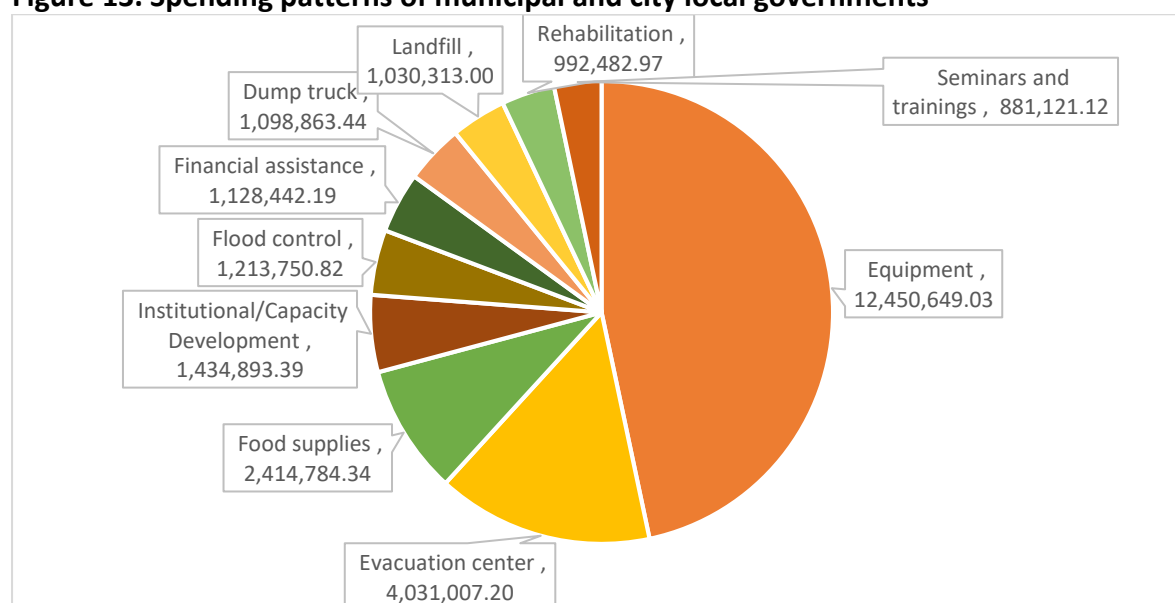
Figure 12. Utilization and non-utilization rates across fund sources and over the years



Source: Authors' calculations

Looking at spending patterns on LDRRMF, most of the funds were channeled into equipment, a wide array that included flashlights, stove, firefighting equipment, and early warning systems among others, followed by construction of evacuation centers which were required for every local government. Food supplies placed third as they were considered as preventive measure and immediate relief; LGUs were encouraged to stockpile food in preparation of disasters. Capacity building through institutional and capacity development, and seminars and trainings were in also in the ten highest expenditures. The patterns also showed how multidimensional and encompassing DRRM as a landscape was as they also spent for solid waste management infrastructures which have no specific fund allocation within the LGU's IRA nor did they have mandated offices to oversee waste management operations.

Figure 13. Spending patterns of municipal and city local governments



Source: Authors' calculations

LDRRMF expenditure reports estimated an average annual allocation of Php 248,554,201.40 million across all regions with only Php 42,207,943.27 utilized values. The utilization rate was estimated at 16.98 percent while the unutilized rate was at high time 81.59 percent. This finding catalyzes a comprehensive discussion on why the country is still characterized with weak DRRM structures and remain incapacitated against disasters despite having well-endowed resources.

After surveying trends and patterns of allocation and utilization, one can surmise that devolved institutional structures are not making efficient use of fiscal resources despite the hefty allocations. An assessment then would backtrack to policy provisions, guidelines and circulars on why the outcome was such, and these results would feedback on the communities and people on the ground who were the supposed beneficiaries of these programs, begging the question whether the public investment on DRRM was enough to mitigate their risks and alleviate their conditions quickly to recovery.

For a disaster-ridden country with high risk levels and worsening vulnerabilities, why were the DRRM funds not overutilized, why were the local governments not overspending, and why were they not tapping into their existing STF pools? These questions may be answered by three plausible reasons: (a) faulty reporting wherein most LGUs may not state their financial reports

accurately hence the underestimation; (b) non-clarity of fiscal guidelines from COA, DBM, and DILG and the threat of disallowances, also lumping in the misinterpretation and confusion on utilization; (c) DRRM was not a priority for public investment.

Prior to RA 10121, World Bank and then National Disaster Coordinating Council reviewed the disaster spending of the country and found that 50 percent of the local calamity fund were unutilized (World Bank 2004 search for ref). The reason then was LGUs preferred to cut back on spending than be entirely disallowed on record by DBM or COA. Five years after, Gordon (2013) reviewed the pre-RA10121 disaster budget from 2009 to 2011, and it was found out that almost 75 percent of the budget was spent on capital investments, concentrating mainly in the construction of flood controls, seawalls, and drainage projects. However, these years were not indicative of the effects of the policy.

Interestingly, while DRRM budgets were mostly appropriated towards post-disaster components, relief aid was not found to have considerable impact on community recovery. This implied that relief aid was but a temporary response but not critical enough to improve recovery time. The factors which aid more substantial effects in facilitating recovery time were the presence of evacuation centers, flood alarm systems, and strong community organizations. It would seem that the local government investment on early warning systems spilled over from the disaster preparation phase to post-disaster rehabilitation (Francisco 2014).

It is important that public funds should be diverted in supporting technologies that could help mitigate future damages and losses at lower costs. Empirical data should also be provided, supporting the linkage of mitigated impacts to economic development. The study positions that the response and recovery amount from the avoided damages could be better programmed to other development initiatives (Subbiah, Bildan, & Narasimhan 2008). Francisco (2014) further supports this finding, veering away from recovery and rehabilitation costs. It is recommended that government should explore concrete alternative strategies aside from merely offering relief aid that could better assist communities. The possibility of broadening credit access that cover property and infrastructure damages is also brought up.

Gordon (2013) compared various mechanisms on national investment planning, budgetary and accounting methodologies employed by governments towards disaster risk management strategies, mostly covering Latin America and Asian Countries. On the policy side, mainstreaming public investment in national plans and strategies is one approach. This is particularly practiced by the Philippines where existing policies and frameworks have facilitated the integration of DRR in national development planning. Despite this, the damage and loss remain high, and recovery and reconstruction slow in affected areas. The study saw this as an indication that fiscal resource for disaster management is limited. On the other hand, the study by Francisco (2014) looked at social transfers which this study failed to capture, but some of its results provide information on capacity-building activities.

Twenty one percent (21%) of the respondents were able to access training seminars. Of this proportion, 46 percent were able to receive state-funded capacity-building participation. It was important to note however that 78 percent, more than three-fourths of the respondents, gleaned on past experiences to deal with the crisis (Francisco 2014).

Amount spent on social infrastructure, public health, social protection, and livelihood provision were not counted as part of DRR budget allocation since (a) these are social services already programmed within basic government functions, and (b) these are counted towards the government's commitment in Millennium Development Goals (MDGs) (Gordon 2013).

4.4.3. Challenges

In most LGUs, bottom-up approach was difficult to institutionalize in the already existing structures. It was also not helpful that marginalized groups in these areas tended to harbor distrust towards any collaboration, attributed to multiple circumstances of delayed promises and unmet expectations. Dynasty and political conflicts were also relevant in hindering the reaching down of assistance. Attempts to introduce capacity-building and technical knowledge would not be sustained in their mindsets. Local governments have the preconceived notion that engaging the community would entail more expenses (transportation, food, honorarium), and that returns for this investment would not be viable in the long run.

Delays in planning and budgeting process contributed to non-achievement of goals prescribed by the NGAs/LGUs/COA. Without approved and streamlined planning documents as well as track of investments, risks of communities may be exacerbated against disasters and lower their capacities to prepare and recover.

The annual reports from the Commission of Audit provided observations on how national and local governments utilize their public investment. It was consistent that there were misuse and mischarge of funds; these covered incidents that charged supplies and equipment against improper sources, the failure to transfer unexpended funds to STF, and the utilization of QRF despite the absence of a state of calamity declaration. The reports also echoed the observations of underutilization in both national and local governments. One of the contributing factors to this problem was the absence of LDRRMP and the non-establishment of LDRRMOs, thereby having no DRR-related plans and investment. Another would be the failure of staff in terms of technical skills and knowledge; poor competencies in these areas could exacerbate misinterpretation of programs, extending as well to document planning and reports submitted to higher agencies.

Moreover, COA also flagged non-conformity with policies and procedures as well as non-submission of reports and status, particularly emphasizing the inability of OCD to prepare annual summary reports. It was important to note however that guidelines can be handed down to local government, but majority of the people tasked for these reports may not have the skillset to comply. As they also operate within the same political landscape, the continuity of experience and knowledge could be hampered with the fast turnover rates.

The following table showed the summary of receipts, utilization, and balances of DRRM funds for 2018. They had a higher utilization rate compared to the computations done with the FDPP archive, bringing into notice the varying reports submitted by local governments to DILG, DBM, and COA, thus making it difficult to conduct validation of data.

Table 1. Summary of receipts, utilization, and balances as of 2018

Particulars	From GAA/Local Appropriation Ordinance			Cash Donations	Total
	NDRRM/LDRRM Fund	QRF	MRRRP		
Beginning balance	29,863,386,885.46	7,153,976,178.07	2,068,542,153.11	3,965,386,680.89	43,051,291,897.53
NGAs/GOCCs	8,332,916,596.78	7,153,976,178.07	2,068,542,153.11	263,673,808.15	17,819,108,736.11
LGUs	21,530,470,288.68			3,701,712,872.74	25,232,183,161.42
Received during CY 2018	30,320,064,947.98	7,600,000,000.00	4,881,848,681.00	3,111,543,020.13	45,913,456,649.11
NGAs/GOCCs	12,473,353,373.00	7,600,000,000.00	4,881,848,681.00	152,482,445.99	25,107,684,499.99
LGUs	17,846,711,574.98			2,959,060,574.14	20,805,772,149.12
Total funds available	60,183,451,833.44	14,753,976,178.07	6,950,390,834.11	7,076,929,701.02	88,964,748,546.64
Less:					
utilized/transferred/reverted funds	20,820,982,603.04	4,177,364,953.56	4,112,462,101.84	3,290,566,381.38	32,401,376,039.82
NGAs/GOCCs					
Utilization	4,117,695,107.23	4,177,364,953.56	3,980,068,538.64	132,941,514.75	12,408,070,114.18
Fund transfers	2,477,570,337.23		132,393,563.20		2,609,963,900.43
Reversion/other adjustments	34,613,024.97				34,613,024.97
LGUs	14,191,104,133.61			3,157,624,866.63	17,348,729,000.24
Percentage of Utilization/Reversion/FT	34.60%	28.31%	59.17%	46.50%	36.42%
Ending balance	39,362,469,230.40	10,576,611,224.51	2,837,928,732.27	3,786,363,319.64	56,563,372,506.82
NGAs/GOCCs	14,176,391,500.35	10,576,611,224.51	2,837,928,732.27	283,214,739.39	27,874,146,196.52
LGUs	25,186,077,730.05			3,503,148,580.25	28,689,226,310.30

Source: COA Annual Reports 2018

4.5. *Key insights*

It was clear during the discussions that proper and informed planning guides institutions and their fiscal structures, and that local chief executives play a vital role in steering policy, institutional, and expenditure frameworks towards their priorities. The capital for this starts with rich and comprehensive datasets and assessments that would also mean functional competencies for people in charge. Sources like CBMS, Listahanan should be readily available for them.

Since the disaster management landscape was multidimensional and crosscutting, non-government organizations like ECOWEB discouraged focusing on a singular problem e.g. providing livelihoods to address poverty but not allowing people to participate in governance. This would alienate people, relegating them to the sidelines despite being in the center of it all. This was the illusion of the best plans formed by consultants as it implied the disconnect from the document to the implementation. It should be a matter of whether the plans are doable for the communities.

One key finding was also the distribution of many sources of funds across local governments, and it was clear that inequitable resource distribution predominated them. Well-endowed regions have much higher allocations compared to the more disadvantaged regions. However, suboptimal DRRM fund utilization was likewise observed across the areas regardless of income class and location. Possible reasons for this were attributed to: (a) non-clarity of fiscal guidelines from COA, DBM, and DILG, and (b) spending preference or prioritization among local government units. As mentioned earlier, local governments become averse to spending when there are variable interpretations on the ground, making the expenditure programs prone to misinterpretation of utilization. Moreover, there is also the looming threat of declaration of disallowances.

In this set-up and arrangement, communities got much to lose, taking into account the very minimal investment of participatory-related PPAs (e.g. IEC). This has produced over dependence on institutional leadership in terms of grounding DRRM initiatives. National policy and international accords have dictated bottom-up participation but implementation process has remained ambiguous or even difficult. While given opportunities, community participation through CSO representation, consultation, and planning inputs through BDRRMP have proven limited, especially when no decision-making powers were granted, and the final say would still come from the higher LGU officials.

The DILG's Full Disclosure Portal is a good platform for transparency and validation, but appropriate standards and quality checks are necessary. There is consistent weak reporting, accounting, tracking and feedback on DRR funds and goods and services, making it difficult to draw lines of accountability. Accounting and auditing processes for local DRR funds have to be properly structured and followed. The use of funds, the separation for unexpended balances into trust funds, the use of the trust fund within and beyond 5 years, and the eventual expenditure reporting have to be clear. Standalone accounts for disaster-related donations should also be maintained to ensure transparency and ease of audit.

5. Conclusion and recommendations

A well-capacitated local government on policy framework and fiscal management can better leverage the DRRM landscape within their locality. This clarity of functions and mandates allows for better interface with national agencies like COA and DILG and easier achievement of goals in the bigger development plans and international commitments.

With this in mind, local governments should strengthen institutional avenues for community and stakeholder participation including but not limited to CSOs, peoples organizations, NGOs, church organizations, and other interest groups, and seriously consider the initiatives proposed through the barangay DRRM plans and practice the inclusion of their inputs to physical framework and socio-economic plans, and investment programs. Likewise, participatory PPAs suggested by those on the ground should be absorbed and implemented, ensuring of course that these are aligned with their disaster management plans.

It has been observed across case studies in local governments and even in NGOs that the community can be a good partner in DRRM. As they are the ones located on the ground, it is easier for them to make full use of their networks to gather data for disaster preparedness plans, conduct information campaign, and carry out disaster response duties. All of these can be encapsulated in community-based DRRM modules with documentations of best practices to help guide capacitation of basic sectors and institutionalize mechanisms.

There are already good, existing initiatives which could be improved on further, but bureaucratic process limitations should be acknowledged first and foremost. One is DILG's Operation LISTO which could take advantage of barangay and local structures. Next would be incentive vehicles like the governance awards. While participatory process has been recognized, it should be a consistent variable in the various awarding criteria. Echoing the call of NGAs for a whole-of-government approach, groups like ECOWEB rallies for a whole-of-society approach.

The absence of standard expenditure report formats makes monitoring and evaluation muddy across the thematic pillars as they tend to spill over. To address this, a stronger M&E system should be instituted alongside budget tagging similar to climate change expenditure tagging mechanism. More distinctive trends could be gathered from this which could ultimately guide future DRRM strategies. ECOWEB further suggested to "make the process easy for them", referring to local governments and even the people who are easily taken aback by uncertainty and non-clarity. Mindset and behavioral changes from the top are also needed for those in the ground up to be easily integrated in the national levels.

Lastly, the post-disaster process should expand from not only detailing expenditures but including the risk and post-disaster assessments as well. An evaluation of lapses in preparation and response should be standard practice among LGUs. This might also better their identification of PPAs in the next fiscal years.

6. References

- Benalia, N., Abdelkafib, I., Fekib, R. 2016. Natura disaster shocks and government's behavior: Evidence from middle-income countries. *International Journal of Disaster Risk Reduction* 27:1-6.
- Brower, R. S., Magno, F. A., & Dilling, J. 2014. Evolving and implementing a new disaster management paradigm: The case of the Philippines. *Disaster and Development*, 289-313.
- Bueza, M. 2014. The role of LGUs, local councils during disasters. *Rappler*. <https://r3.rappler.com/newsbreak/44026-role-lgu-local-councils-disasters> (accessed on November 28, 2020)
- Delica-Willison, Z. & Gaillard, J. G. 2012. Community action and disaster. The Routledge handbook of hazards and disaster risk reduction. London: Routledge.
- DILG. Memorandum No. 2014. Guidelines on mainstreaming disaster risks and climate change in local development plans. https://dilg.gov.ph/PDF_File/issuances/memo_circulars/dilg-memocircular-2014122_60fdc0fb34.pdf (accessed on November 29, 2020).
- Ecosystems Work for Essential Benefits, Inc. (ECOWEB). n.d. *ECOWEB: About Us*. <https://ecowebph.org/about-us/> (accessed on November 27, 2020).
- Florano, E. R. 2014. Community governance for disaster recovery and resilience: Four case studies in the Philippines. Discussion Paper Series No. 2014-38. Makati City, Philippines: Philippine Institute for Development Studies.
- Francisco, J. P. 2014. Determinants of property damage recovery time amongst households affected by an extreme flood event in Metro Manila, Philippines. *Jamba: Journal of Disaster Risk Studies*, 119:1-10.
- Gordon, M. 2013. *Exploring existing methodologies for allocating and tracking disaster risk reduction in national public investment*. Geneva, Switzerland: United Nations Office for Disaster Risk Reduction (UNISDR).
- International Recovery Platform (IRP). 2010. *Cases and practices on role of community in recovery*. Kobe, Japan: IRP.
- Hall, M. 2018. The financial effects a natural disaster. *Investopedia*. <https://www.investopedia.com/financial-edge/0311/the-financial-effects-of-a-natural-disaster.aspx> (accessed on March 24, 2020).
- NDRRMC-DBM-DILG. Joint Memorandum Circular No. 2013-1. Allocation and utilization of the local disaster risk reduction and management fund (LDRRMF). <https://www.dbm.gov.ph/wp-content/uploads/Issuances/2013/Joint%20Memorandum%20Circular/JMC2013-1.pdf> (accessed on November 28, 2020).

- Perez, R. T. 2008. A community-based flood risk management in the Lower Pampanga River Basin. *Journal of Environmental Science and Management* 11, 1, 55-63.
- Post, P. 1997. Urban management in an unruly setting. *Third World Planning Review*, 19, 4, 347-365.
- Rivera, N. A. DJ., & Vargas, D. 2018. Community disaster resilience: The case of Typhoon Karen (Sarika) affected barangays in San Miguel, Bulacan. *The CLSU International Journal of Science and Technology*, 3, 1, 1-13.
- Sawada, Y., & Takasaki, Y. 2017. Natural disaster, poverty, and development: An introduction. *World Development*, 94:2-15.
- Subbiah, A. R., Bildan, L., & Narasimhan, R. 2008. Background paper on assessment of the economics of early warning systems for disaster risk reduction. *World Bank Group for Disaster Reduction and Recovery*. http://ral.ucar.edu/~hopson/Verkade/Economics/Subbiah_EWS.pdf (accessed on March 24, 2020).
- Totikidis, V., Armstrong, A., & Francis, R. 2005. The concept of community governance: A preliminary review. Refereed paper presented at the GovNet Conference, Monash University, Melbourne, November 28-30, 2005.
- Wang, A., Marinova, D., Wang, F., & Wei, J. 2020. Corporate investor confidence in the aftermath of a mega natural disaster: An empirical study of the 2008 Wenchuan earthquake. *Safety Science* 125.
- Wu, X., Wang, Z., Gao, G., Guo, J., Xue, P. 2020. Disaster probability, optimal government expenditure for disaster prevention and mitigation, and expected economic growth. *Science of the Total Environment* 709.
- Ye, T., Yokomatsu, M., Shi, P. J., & Okada, N. 2013. Government intervention into the disaster insurance market: Issues and alternatives in Japan and China. In *Local, regional, and international level cooperation in disaster risk management*, ed. S. R. Sensarma & A. Sarkar, 162-191. New Delhi, India: Concept Publisher