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Local government unit capacity for disaster risk reduction and management: from disaster to resilience

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Abstract. The creation of Disaster Risk Reduction and Management Council (DRRMC) at various levels in the government including the local government units (LGUs) as stipulated in Republic Act (RA) 10121 institutionalizes DRRM in the Philippines. Thus, this paper describes the existing initiatives on DRRM of LGUs in Pablo (Bopha) affected areas in the provinces of Davao Oriental and Compostela Valley, Philippines. It also assesses their capacity needs for resiliency and explores on socio-political issues and geo-physical conditions that may relate to their DRRM needs and initiatives. Information generated is culled out from the data of a USAID-funded project entitled "LGU Adaptive Capacity Needs Assessment and Long-term Planning Assistance", gathered through Focus Group Discussions (FGDs) and survey among members of DRRMC. Findings reveal that even prior to the institutionalization of DRRMC, there were activities on disaster preparation and climate change adaptation conducted. However, the lack of a more comprehensive DRRM plan and more strengthened DRRMC limits the implementation of concrete and wide-ranging initiatives. Consequently, a number of socio-political issues and their geo-physical conditions have bearing on their existing initiatives and needs for disaster preparation and climate change adaptation. Hence, DRRMC has a critical role in addressing issues on disasters by mobilizing and optimizing resources for DRRM. The institutionalization of DRRM at the LGU level is a venue to holistically address disaster concerns towards resiliency.
Key Words: climate change adaptation, local governance, disaster preparedness, capacity needs.

Introduction. Historically, disaster risk reduction and management practices were already observable in 3200 BC among the "Asipu" of the now modern day Iraq. However, a "modern disaster management" where "global standards and more organized" efforts took place only in the mid-20th century (Coppola 2007). Advanced countries obviously took the lead, particularly in the formulation of legal frameworks for mitigation, preparedness, and response for disasters.

In the Philippines, Republic Act 10121 or the Philippine Disaster Risk Reduction and Management Act of 2010, was implemented. This policy strengthens the disaster risk reduction and management (DRRM) system in the country. It provides for the DRRM framework and institutionalizes the national DRRM plans (Domingo 2014). Its important component is the creation of DRRM Council at the national and local levels. Hence, this act evidently acknowledges the critical role of the government in DRRM. On the other hand, literatures on disaster management emphasize the importance of community-based and participatory approaches (Yodmani 2001; Allen 2006; Chen et al 2006; Gaillard 2011). Indeed, community-based approaches empower local people for DRRM. These strategies allow the various sectors in the community to participate in DRRM initiatives from conceptualization to implementation.

While the significant role of local people in DRRM is recognized, it is likewise important to consider the crucial function of governance and leadership. The local people and other resources in the community need to be mobilized and lead by a legitimate governing institution. There must be a system to organize and mobilize the community resources for a more effective DRRM. Thus, the creation of the DRRM council as

stipulated in R.A. 10121 could be a strategic response for this contention. A major function of the council is to come up with a DRRM plan for implementation.

However, the local implementation of RA 1021 as a national policy needs to be evaluated. After four years of its ratification, it is interesting to explore the experiences and issues relative to the implementation of such policy. More specifically, the experiences of communities that had been hit by a super typhoon for the first time, are worth examining. Hence, this paper is part of a multi-component disaster recovery assistance program designed and implemented by the United States Agency for International Development (USAID) through its Growth with Equity in Mindanao Program in southern Philippines. Along with education, livelihood, and infrastructure projects, a Vulnerability Assessment (VA) was conducted as part of its assistance to disaster-affected areas. Part of the recommendation of VA was to develop mitigation, adaptation and institutional measures, and other follow-on activities where this project entitled "LGU Adaptive Capacity Needs Assessment and Long-term Planning Assistance" is a component.

This paper aims to explore on the experiences of areas that are affected by super typhoon Pablo (Bopha) in December 2012. Specifically, it aims to: a) evaluate the initiatives on DRRM of Pablo (international name: Bopha)-affected areas; b) assess their DRRM capacity needs for resiliency; and c) explore on the socio-political issues and geo-physical conditions relating to their DRRM initiatives and needs.

Methodology. The data are generated through Focus Group Discussions (FDGs) and survey among members of the provincial and municipal DRRM councils (P/MDRRMC) in the eight municipalities of the provinces of Compostela Valley and Davao Oriental and that were hit by super typhoon Pablo (Bopha). Specifically, ten sessions of FGDs were separately conducted. There were also 146 members of P/MDRRMC who were conveniently selected as respondents of the survey. Qualitative responses were transcribed and analyzed to form part of the discussion. The numerical data were likewise subjected to descriptive analysis using percentage and frequency count. Figure 1 shows the eight municipalities that were affected by super typhoon Bopha. The red line shows the path of the said typhoon.

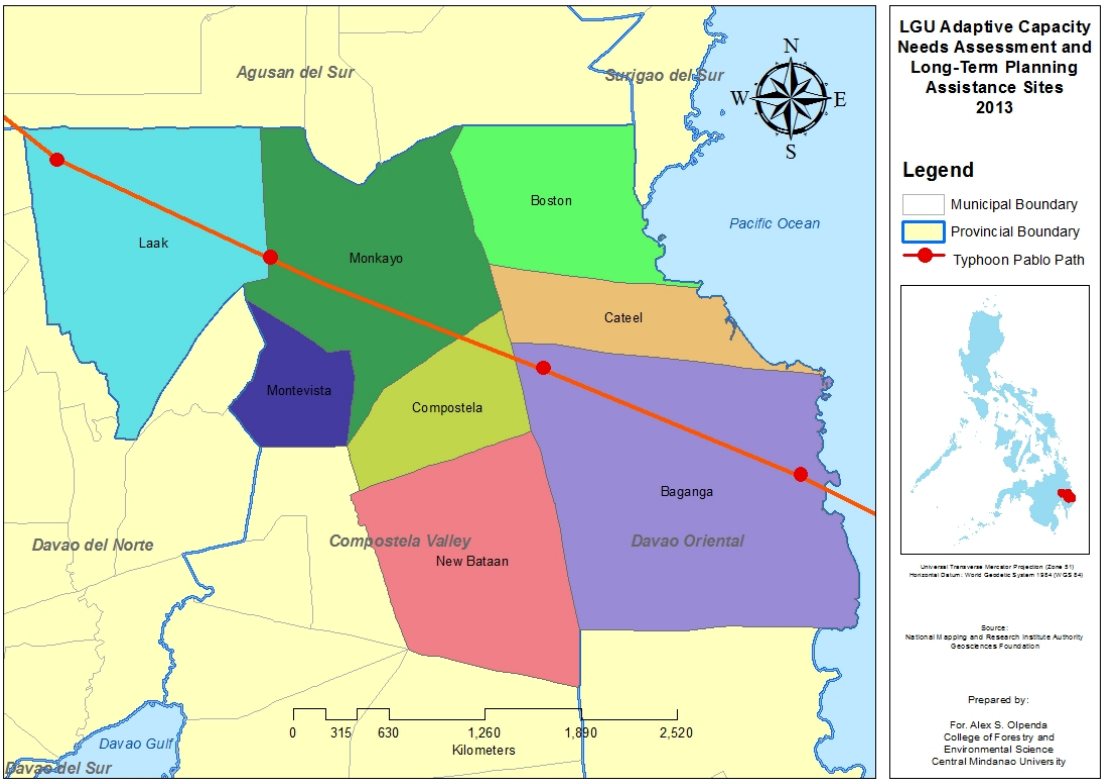

Figure 1. Map of Pablo (Bopha)-affected areas (Source: Report on GEM PROGRAM: Vulnerability rapid assessment study follow-on activity).

Results and Discussion

DRRM initiatives. Municipalities have already initiated activities to respond to disasters which the project is able to categorize as shown in Table 1. Specific activities relative to DRRM have been conducted in areas, before and after the occurrence of the said super typhoon.

Table 1

Initiatives on disaster risk reduction and management

	Initiatives on DRRM
Institutionalization	Established provincial/municipal DRRM council Formulated DRRM plan/list of activities Established Incident Command System (ICS) Appropriated the 5% DRRM fund
Capacity building	Conducted trainings on first aid and information on RA 10121 Conducted seminars and trainings among rescue teams Conducted meetings regularly Trained some personnel on GIS
Data generation	Availed of and utilized weather and other information e.g. meterological data from PAGASA, MGB, PHILVOLCS Availed of geohazard maps from MGB Acquired instruments that determine rain gauge, hydrometer, humidity, and temperature, for weather forecasting Gathered disaster-related data Conducted monitoring and vulnerability risk assessment
Advocacy	Disseminated advisory from MGB and DRRM to the barangays Implemented the “No build zone” policy; forced evacuation Invited speakers to discuss climate change in schools Conducted disaster preparedness drills in schools Conducted first aid orientation and forums in the barangays
Environmental protection	Tree planting and watershed protection Riverbank stabilization, planting, cleaning
Agriculture	Provision of seeds for agricultural diversification and selection of climate change-adaptive crops

The DRRM councils in the two provinces and 8 municipalities have been established in compliance to RA 10121. LGUs are aware of the budget allocation of 5% of its Internal Revenue Allotment (IRA) for DRRM. DRRM plans also were formulated but these vary in terms of content and substance among the different municipalities. However, the effective and efficient functioning of DRRMC is problematic even prior to the typhoon. For instance, there were few seminars and trainings on DRRM conducted among some personnel. There are also initial efforts on generation, utilization and dissemination of DRRM data. Contrastingly, most LGUs are engaged in environmental protection activities such as tree planting and watershed protection in line with the National Greening Program (NGP) of the Philippine government. Community members, particularly the farmers, were also provided with seeds that are more adaptive to climate change.

These initiatives are worth mentioning but there could be something missing as evident in the limited preparation for and in response to the super typhoon Pablo. Experience of these communities relative to disasters may have contributed to such limited initiatives. It could be noted that these areas have never been known for typhoons, unlike the other regions in the country. Thus, both the government and its constituents have apparent needs in terms of responding to disasters, despite the enactment of RA 10121.

Capacity needs for resilience. Results of the survey revealed that there is a need for strengthening the capacity of the Pablo-affected areas for DRRM activities. Tables 2, 3, 4,

and 5 show that P/MDRRMC have a high demand for strengthening their institutional capacity, database management, advocacy and financial capacity.

Majority of the P/MDRRMC members see the need to be capacitated in the post- and pre-disaster events. Proactive response for pre- and post-disaster events that set the over-all DRRM initiatives, specifically strategic planning, is in the bottom of the list. This could probably because LGUs received capability building activities on DRRM from national agencies. In fact, LGUs are required to formulate their respective DRRM plans as per RA 10121.

Table 2

Institutional capacity needs of P/MDRRMC (no. of respondents = 146 multiple response)

Institutional capacity needs	*Frequency*	*%*
Environmental impact assessment of post-disasters	126	86.3
Climate-change ready plans, programs and policies	123	84.2
Establishment of early-warning system and devices	120	82.2
Rapid assessment	119	81.5
Climate-ready/disaster responsive infrastructure design	110	75.3
Natural resources management (NRM)	110	75.3
DRRM plan formulation	109	74.7
Monitoring and evaluation	104	71.2
Conduct of training and seminars on DRRM	103	70.5
Networking	102	69.9
Community organizing (including volunteer groups, committees, local disaster groups, etc.)	93	63.7
Strategic planning	93	63.7
Maintenance of early-warning devices/equipment	88	60.3

Due to the onset of Pablo, P/MDRRMC now see the need for climate data for monitoring and generate spatial information as revealed in Table 3. LGUs expressed that information on the number and names of affected households have become problematic due to lack of data storage and retrieval system. As shared during discussions, data which were stored in hard files/papers or computers were damaged during the disaster thus, information on affected households have become problematic due to lack of data storage and retrieval system.

Table 3

Frequency and percentage distribution of database management needs (no. of respondents = 146 multiple response)

Database management needs	*Frequency*	*%*
Data collection of parameters (e.g. rainfall, temperature, stream discharge, etc.).	117	80.1
Geographic information system (GIS)	113	77.4
Data storage/retrieval system	112	76.7
Use of statistical software for data analysis	112	76.7
Data presentation (e.g. graphs, charts, videos, maps)	111	76.0
Database establishment	110	75.3
Management information system (MIS)	109	74.7
Map interpretation/analysis	108	74.0
Data access	104	71.2
Local disaster mapping/community mapping	104	71.2
Integrating data/information into local policy formulation	103	70.5
Knowledge/information sharing	85	58.2
Networking	84	57.5

Data on Table 4 shows that formulation and dissemination on disasters are deemed important for P/MDRRMC. The huge damage of typhoon has taught them significant learning on the need for advocacy on disaster preparedness. Although disaster preparedness drills are conducted in some schools, the need for its integration in the curricula can make advocacy more effective.

Table 4

Advocacy capacity needs (no. of respondents = 146 multiple response)

Advocacy capacity needs	*Frequency*	*%*
Formulation of IEC materials on disaster	103	70.5
Establishment of early-warning system	101	69.2
Production of culture-sensitive IEC materials	98	67.1
Documentation	98	67.1
Integration of DRRM in school curricula/programs	96	65.7
DRRM plan dissemination	91	62.3

RA 10121 stipulates that 5% of the Internal Revenue Allotment (IRA) is allocated for DRRM. However, the intensity of the damage could have been the reason why budgetary allocation is still a common concern among P/MDRRMC as shown in Table 5.

Table 5

Financial capacity needs (no. of respondents = 146 multiple response)

Financial capacity needs	*Frequency*	*%*
Budgetary allocation	96	65.7
Formulation of mechanisms for contingency measures / financial reserves	94	64.4
Financial monitoring	92	63.0
Fund sourcing	91	62.3

The different expressed needs as shown in the capacity indicators are crucial to a relatively successful DRRM. Thus, responding to these needs may guarantee a more prepared community during disasters. The data could also reveal to national agencies and international donors the DRRM interventions needed to capacitate and equip P/MDRRMC in responding the various concerns on pre, during and post disaster events. However, good governance and leadership play very significant roles in the whole DRRM. Hence, legislation per se is not sufficient but more of a serious implementation and commitment to DRRM laws and policies. This means that appropriate and responsive activities are to be designed and implemented in order to concretize DRRM.

Issues relative to initiatives and needs for DRRM. As mentioned, response to disasters is a classic example of the need for governance and leadership in the implementation of DRRM law. There are social and political issues that P/MDRRM have to confront with (Table 6).

Table 6

Issues relative to DRRM

Social	Lack of emphasis on DRRM by LGUs and passive response of communities; DRRM functions are just “add on” responsibilities; Motivation in coming up with the plan is simply for compliance.
Political	Lack of political will both at the barangay and municipal level in the implementation of plan; DRRMC cannot level off due to change in administration; Lack of coordination between provincial and municipal LGUs, and the barangays.

The limited number of initiatives could be related to certain social and political issues in these areas. One of the social issues is the lack of emphasis on DRRM by the sectors in the community including the LGUs. As mentioned earlier that prior to typhoon Pablo, these areas were not affected by major disasters, at least in the last twenty or fifty years. Thus, communities and LGUs were less motivated to be concerned with DRRM.

While R.A. 10121 pushed for the creation of DRRM council at the provincial and municipal levels, the personnel who are assigned as members of the council are also performing other functions. In fact, their membership in the council is just an "add on" responsibility. Hence, they spend limited time, effort, and other resources for planning and implementing a more comprehensive and relevant activities.

Along with the creation of the DRRM council is the formulation of DRRM plan in the province and municipality. Ideally, this plan will serve as a blue print for all DRRM activities. However, the expected purpose of the plan is not materialized when it is just formulated for compliance. This happens when the above issues are present in the province/municipality. When DRRM is not a priority, the planned activities could be less likely implemented and limited resources would be allocated. Thus, when disaster occurs, there is no clear process or mechanism to be followed. Consequently, donor agencies or organizations have no clear coordination of how to channel the response. In addition, local leaders and responders are themselves victims to disasters that make it impossible to perform their functions as P/MDRRMC. This is what happened during the typhoon Pablo.

There are also political issues that may relate to the limited number of DRRM initiatives. Firstly, the lack of political will impedes the implementation of DRRM activities. Local officials more likely implement projects that are perceived as more relevant, urgent and visible at the community. Sustaining political will has indeed been mentioned as a one of the challenges on DRRM (Christoplos et al 2001). Secondly, the change in LGU administration may also relate to few DRRM initiatives. Like most of government projects, the change in leadership may also result to discontinuity in DRRM activities that were planned or initially implemented. Lastly, the lack of coordination among various levels of local government impedes the success of DRRM initiatives in the province or municipality. DRRM requires a coordinated network of social groups or political units, especially among those who are affected and not affected by disasters. In such case, nearby LGUs not affected by disasters can extend its support to affected areas to effectively mobilize disaster response to provide the basic needs and services to affected communities.

Geo-physical conditions. The above issues are likewise supported by the following data on the geo-physical conditions in the two provinces. It can be gleaned in Tables 7 and 8 that there is a low frequency of occurrence of disaster events in the said areas. Exposure to and experience on disasters can both provide the means for LGUs to make strategic response to become more resilient to disasters.

Table 7

Frequency of occurrence of disaster event in Compostela Valley (no. of respondents = 87)

Event	*Frequency of occurrence*			
	Low (6 yrs or more)	*Medium (3-5 yrs)*	*High (1-2 yrs)*	*N/A*
Storm	64	1	9	6
Flood	18	12	52	3
Landslide	34	24	22	3
Drought	47	9	3	23
Pest/insect infestation	55	10	2	2
Forest/brush fire	7	-	-	42
Fish kill	4	4	1	29

Table 8

Frequency of occurrence of disaster event in Davao Oriental (number of respondents = 59)

Event	*Frequency of occurrence*			
	Low (6 yrs or more)	*Medium (3-5 yrs)*	*High (1-2 yrs)*	*N/A*
Storm	47	5	7	-
Flood	29	9	20	1
Landslide	31	9	14	2
Drought	20	16	2	18
Pest/insect infestation	47	5	1	4
Forest/brush fire	18	-	-	36
Fish kill	11	8	2	24
Coastal/ beach erosion	16	10	17	2

However, data in Table 9 shows that temperature in the provinces of Compostela Valley and Davao Oriental is projected to increase by more than 1^{o}C and 2^{o}C by the year 2020 and 2050, respectively. Frequency of extreme rainfall events will also likely to increase as shown in Table 10. Thus, DRRM initiatives need to be taken seriously for disaster is currently both local and global concerns.

Table 9

Seasonal temperature increase (in ^{o}C) in 2020 and 2050 under medium-range emission scenario in provinces in Region 11

Provinces	*Observed baseline (1971-2000)*				*Change in 2020 (2006-2035)*				*Change in 2050 (2036-2065)*			
	DJF	*MAM*	*JJA*	*SON*	*DJF*	*MAM*	*JJA*	*SON*	*DJF*	*MAM*	*JJA*	*SON*
Compostela Valley	26.7	27.8	27.6	27.6	0.9	1.1	1.2	1.1	1.9	2.3	2.4	2.1
Davao del Norte	26.7	27.8	27.4	27.4	0.9	1.1	1.2	1.1	1.9	2.3	2.5	2.1
Davao del Sur	26.9	27.8	26.9	27.1	0.9	1.1	1.1	1.0	1.9	2.2	2.3	2.0
Davao Oriental	26.8	27.8	27.5	27.6	0.9	1.0	1.1	1.0	1.8	2.0	2.4	2.0

DJR (Dec-Jan-Feb); MAM (Mar-Apr-May); JJA (Jun-Jul-Aug); SON (Sept-Oct-Nov); Source:DOST-PAGASA, Philippines, 2011.

Table 10

Seasonal rainfall change (in %) in 2020 and 2050 under medium-range emission scenario in provinces in Region 11

Provinces	*Observed baseline (1971-2000)*				*Change in 2020 (2006-2035)*				*Change in 2050 (2036-2065)*			
	DJF	*MAM*	*JJA*	*SON*	*DJF*	*MAM*	*JJA*	*SON*	*DJF*	*MAM*	*JJA*	*SON*
Compostela Valley	748.1	559.0	546.7	586.6	10.2	-11.3	-2.7	0.3	6.6	-21.9	-6.5	0.0
Davao del Norte	637.0	496.5	535.6	556.2	9.2	-12.5	-3.6	-1.5	1.1	-22.2	-7.9	-2.2
Davao del Sur	288.1	347.1	494.1	442.3	18.1	-9.8	-7.8	-2.4	15.2	-12.0	-12.6	-4.5
Davao Oriental	827.3	611.8	540.4	599.2	12.3	-5.7	-4.7	1.2	15.9	-16.1	-9.9	4.9

DJR (Dec-Jan-Feb); MAM (Mar-Apr-May); JJA (Jun-Jul-Aug); SON (Sept-Oct-Nov); Source:DOST-PAGASA, Philippines, 2011.

Conclusions. This study reveals that despite the enactment of DRRM law, there are relatively limited DRRM initiatives conducted by Pablo-affected LGUs. The aftermath of the super typhoon provided important learnings for P/MDRRMC, particularly on the need for strengthening their capacity in terms of institutionalization (particularly in formulating DRRM plan), advocacy, database management, and funding. The indicators in each of the needed capacity can become the basis for national agencies and international donors to focus their respective initiatives or responses for a more effective DRRM. More so, the interplay of socio-political issues and geo-physical conditions hamper the implementation of DRRM policies and programs. DRRM was not a priority (both by the government and the community) because historically, these areas were not affected by super typhoon like Pablo. Hence, Pablo served as an "eye opener" for a more serious proactive response to disasters and climate change impacts.

Recommendations. Based on the above findings where DRRM plan is emphasized, an immediate- to long-term assistance on the formulation, implementation, and monitoring and evaluation (M & E) of a comprehensive, responsive and community-based DRRM plans, is suggested. It is also recommended that the local information and resources will complement science-based data that should be integrated in the DRRM plans. Coordination and networking among LGUs are important to build strong and sustainable support system, especially during and after a disaster. Partnership of LGUs with non-government and development-oriented organizations has to be strengthened in order to optimize its resources for DRRM. This means that tasking and responsibilities have to be clearly articulated in the DRRM plan, not only for P/MDRRMC but to all agencies who have their respective mandates for DRRM. On the other hand, donor and development-oriented organizations have to express their commitment to provide specific support such as data, infrastructures and social services. All these have to be clearly articulated in the DRRM plan. Most importantly, there is a need to contextualize the Philippine DRRM framework appropriate to the conditions, vulnerabilities, needs and capacity of the LGU and the affected communities. All these effort are aimed to make DRRM initiatives an effective mechanism to transform disaster into more resilient communities.

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