



Report

## Towards policy-relevant science and scientifically informed policy

Political economy of the use of knowledge and research evidence in urban resilience interventions in the Philippines

Arnaldo Pellini (ODI), and Antonio Contreras, Melvin Jabar, Ma. Teresa de Guzman, Marlon Era, Dennis Erasga and Robert Javier Jr. (Social Development Research Center, De La Salle University, Manila)

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Key messages

- The Philippines are the third most disaster prone country in the world according to the World Bank.
- There is low uptake of research and analysis to inform local decision-making on disaster risk management
- Demand for research and knowledge on DRM is linked to disasters happening rather than the risk of disasters
- While relocation can be considered an evidence-based and technically sound solution, it is often not politically feasible.
- Some examples exist of positive use of evidence in policy-making, indicating the possibility to build stronger links between knowledge and policy for resilient urban communities.

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# Acknowledgements

The authors would like to express their gratitude to AusAID and ODI for generous funding; the Social Development Research Centre (SDRC) of De La Salle University in Manila for facilitating the conduct of research; the city government of Navotas for facilitating the pre-testing of our instrument; and the cities of Baguio, Tabaco, Marikina, Cebu, Iloilo, Cagayan de Oro and Davao for their invaluable contribution and cooperation during the collection of data. We would like to thank the various national, local government and donor agencies who participated during the validation workshop. We would like to thank Harry Jones, a Research Fellow at ODI, and Ajoy Datta, a Research Officer at ODI, for their comments on an early draft of the report. We would like to thank Alice Barling-Gasson Programme Officer at ODI for the support provided throughout the study and Deirdre Smith for proofreading the report. The views and findings contained in this report are solely those of the authors, and not of the institutions mentioned above.

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# Abbreviations

<b>ADB</b>	Asian Development Bank
<b>AusAID</b>	Australian Government Overseas Aid Program
<b>CDRRMC</b>	City Disaster Risk Reduction and Management Council
<b>CIRCA</b>	Centre for Initiatives and Research on Climate Change Adaptation
<b>CNDR</b>	Corporate Network for Disaster Response
<b>CSO</b>	Civil Society Organisation
<b>DEFRA</b>	Department of Environment, Food and Rural Affairs (United Kingdom)
<b>DENR</b>	Department of Environment and Natural Resources
<b>DILG</b>	Department of Interior and Local Government
<b>DND</b>	Department of National Defence
<b>DOF</b>	Department of Finance
<b>DOH</b>	Department of Health
<b>DOST</b>	Department of Science and Technology
<b>DPWH</b>	Department of Public Works and Highways
<b>DRRM</b>	Disaster Risk Reduction and Management
<b>DRRMO</b>	Disaster Risk Reduction and Management Office
<b>DSWD</b>	Department of Social Welfare and Development
<b>ebpdn</b>	Evidence-based Policy in Development Network
<b>IPCC</b>	Intergovernmental Panel on Climate Change

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<b>LGU</b>	Local Government Unit
<b>MOA</b>	Memorandum of Agreement
<b>NAMRIA</b>	National Mapping and Resource Information Authority
<b>NDCC</b>	National Disaster Coordination Council
<b>NDRRMC</b>	National Disaster Risk Reduction and Management Council
<b>NEDA</b>	National Economic Development Authority
<b>NGO</b>	Non-governmental Organisation
<b>OCD</b>	Office of Civil Defence
<b>ODI</b>	Overseas Development Institute
<b>PAGASA</b>	Philippine Atmospheric, Geophysical and Astronomical Services Administration
<b>PEA</b>	Political Economy Analysis
<b>PHILVOCS</b>	Philippine Institute of Volcanology and Seismology
<b>PIA</b>	Philippine Information Agency
<b>RA</b>	Republic Act
<b>RAPID</b>	Research and Policy in Development
<b>SDRC</b>	Social Development Research Centre
<b>SNAP</b>	Strategic National Action Plan
<b>UNDP</b>	United Nations Development Programme
<b>USAID</b>	United States Agency for International Development
<b>WTO</b>	World Trade Organisation

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# Executive summary

The United Nations 2009 Global Report on Disaster Risk Reduction ranked the Philippines as the third most disaster-prone country in the world, and the country with the largest population exposed and displaced every year due to natural disasters.

When natural disasters such as violent floods, typhoons or earthquakes occur, the damage has long lasting effects, not only on the economy but more importantly, on people's lives and a community's sense of security and normalcy.

While natural disasters cannot be avoided, it is the duty of governments and civil society in general to develop initiatives that reduce the negative effects natural disasters have on people's lives.

In this study we look at urban resilience policies – the tools governments use to make decisions and implement disaster risk reduction, as well as initiatives aimed at reducing the negative effects of natural disasters. We define urban resilience as 'the ability of an urban system, community or society exposed to hazards to resist, absorb, accommodate and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.' (UNISDR 2009).

As noted by Ashley (2011)<sup>1</sup>, 'we know how good decision-making works. It should be fact-based, deliberative and tested by real arguments. This means it needs people who have the knowledge to engage and the self-confidence to challenge assumptions.' To paraphrase Ashley, we could say that 'we know how good policy works. It should be fact-based, deliberative and tested by real arguments.'

This study examines whether the processes that govern policy and decision-making on resilience to natural disasters in urban areas of the Philippines are good, i.e. fact-based and deliberative, and tested by real arguments.

Seven illustrative Local Government Units (LGUs), (Tabaco City, Baguio City, Marikina City in Luzon, Iloilo City and Cebu City in Central Visayas and Davao City and Cagayan de Oro City in Mindanao) were selected as case studies to better understand the factors that favour or hinder the use of knowledge and research evidence in the design and implementation of urban resilience policies and practice. The choice of the case study areas is linked to the occurrence of natural disasters, and the experience of decision-making and local planning on climate change/urban resilience.

The research was conducted by adopting a political economy analysis to create an analytical framework that focuses on the specific topic of use of knowledge in policy decision-making processes. Data collection was conducted through focus group discussions and semi-structured interviews.

The key finding of our study is that the Republic Act 10121, which was passed in 2010, established, among other things, a legislative framework that enables greater use of scientific evidence in designing disaster risk reduction policies and interventions, both at national and sub-national level. It is still early days to assess the impact of the new legislation, and there are delays in the implementation of the Republic Act, such as training

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<sup>1</sup> Jackie Ashley, The danger of big-man politics, The Guardian Weekly 9.9.11 p. 21

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line agency staff at sub-national level on preparing against disasters and developing resilient communities, as well as responding to natural disasters.

Another important finding is that LGUs do not usually demand or procure research and analysis to inform their policy decision-making process on disaster risk reduction. The demand for use of scientific knowledge by policy-makers is linked to the occurrence of a natural disaster rather than the risk of occurrence of a natural disaster.

A topic that is politically loaded is the issue of relocating communities living in areas at high risk of natural disasters. As well as the economic costs, a decision to relocate communities is almost certain to encounter strong opposition and protests, which can be very ‘expensive’ politically, and end in action being delayed. Therefore, while relocation can be considered an evidence-based and technically sound solution, it is often not politically feasible.

We found exceptions to the limited use of evidence in policy decision-making in this area, with examples of greater engagement between local administrations and academic institutions. These cases are context specific. In the province of Albay (a high-risk area) the governor was able to build political will on disaster prevention and establish close links with the Climate Change Academy at Bicol University. In Cagayan de Oro, following Typhoon Sendong in 2011, Xavier University collaborated with the local administration. In Davao, the Davao Association of Colleges and Universities has an explicit objective to increase the use of research evidence in policy-making.

These examples show it is possible to develop in the Philippines evidence-based decision-making processes on disaster risk reduction that can contribute to building more resilient urban communities.

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# 1 Introduction: an overview of the use of knowledge in policy-making

British philosopher Bertrand Russell, in the introduction of his *The History of Western Philosophy* (1945) writes: ‘All *definite* knowledge — so I should contend — belongs to science; all *dogma* as to what surpasses definite knowledge belongs to theology. But between theology and science there is a No Man’s Land, exposed to attack by both sides; this No Man’s Land is philosophy.’

This study is a walk into that No Man’s Land to search for an answer to a specific question (which you may or may not consider philosophical): What role do knowledge and research evidence play in policy decision-making processes?

The success of development interventions and their translation into policies depends on governments and international development agencies recognizing that their interventions have to adapt to the complexity and uncertainty of development problems. It also requires seeing their interventions and policy-making in general, as an incremental process of trial and error through political interaction (Rondinelli 1983). To achieve this there needs to be a change in attitude, a departure from the conventional methods of analysis, planning and management that were introduced in the 1960s and 1970s, which did not embed the flexibility, responsiveness and learning required to facilitate social change and reforms (*ibid.*).

Rondinelli’s main point is that, in a complex and uncertain environment, the capacity of policy-makers and development planners to predict and control the future is limited. Programs and projects must therefore be seen as experiments. Analysis, planning and management help detect errors and successes, and generate information that allows for making better-informed policy decisions. This is particularly relevant to urban resilience policies and interventions which are at the centre of our study, as they ultimately aim to change people’s behaviours and perception of the risks associated with climate change and natural disasters in urban areas.

Central to Rondinelli’s approach are knowledge generation and flexible management. Knowledge, in particular, allows for adapting the course of a program or project, and is the source of evidence that will ultimately provide policy-makers with the information and data required for designing new policies or improving the implementation of existing ones.

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What may be new today compared to the 1980s is that in middle income countries like the Philippines, the generation of policy-relevant knowledge and research evidence by independent research institutions and universities has increased considerably, creating more opportunities for policy decision-makers to tap into various types of knowledge, including scientific knowledge. What is open to scrutiny and what we analyse in this paper is whether, with regard to urban resilience, knowledge actually reaches policy-makers (both at national and sub-national level) and is embedded in their decision-making processes.

In the next section we describe the key definitions that we use throughout the paper.

## 1.1 Evidence-based policy-making

Evidence-based policy-making is not a new concept or idea. If we look at Scandinavian countries, we see that they are among the richest in the world and have developed welfare systems based on comprehensive social policies and universal social rights (Kuhnle and Hort 2004). What is interesting in the Scandinavian experience is that the development of their welfare systems was preceded, in the second half of the nineteenth century, by a considerable expansion of the state capacity and apparatus to collect and record social statistics and social data. The experience from Sweden, highlighted by Kuhnle and Hort (*ibid.*), shows the importance of developing capacity and systems to collect relevant data that would result in social legislation and the definition of legislative priorities. The main lesson from this experience is that the state's capacity to provide statistics (i.e. evidence) was a key element of the legislative effort required to develop universal welfare systems.

While J. M. Keynes noted that there is nothing government hates more than the well-informed, as it makes the process of arriving at a decision complicated and difficult, evidence-based policy-making emerged in the United Kingdom as a political discourse with the Labour Government led by Tony Blair in 1997 (Davies 2004). The new prime minister's underlying aim was to modernize the government machine through greater commitment to evidence-based policy, the assumption being that policies informed by knowledge and research evidence are *better* policies. Other countries have followed the trend, therefore showing a commitment, as noted by Sutcliffe & Court (2006), to place, side-by-side, ideologically driven politics with more rational policy decision-making.

We define policy in this study as 'a set of decisions which result in concrete plans for actions or negotiated agreements' (Jones et al., 2012). While all political actions are guided by some thinking and/or interests, knowledge and evidence generated by scientific research can contribute to reducing the influence of personal and political interests in decision-making processes. As noted by Jones et al. (*ibid.*), there is not a perfect piece of evidence that can influence policy. Evidence-based policy-making is therefore the result of an uptake of various pieces and types of evidence, combined with arguments based on personal interests and incentives (Jones et al., 2012). Policy-making is usually influenced by lobby groups, professional expertise, political ideology, resources, values and research-based knowledge. They all bring some sort of knowledge and influence to the process (Davies 2004). The perennial challenge is therefore, how to make different types of knowledge, particularly scientific or research-based knowledge, stand out and influence the policy process.

Pellini et al. (2012) suggest a way to classify different types of knowledge aimed at influencing policy which shows that different types of knowledge are legitimate sources of evidence for policy-making. We have chosen for our analysis a purpose-based knowledge categorisation where different types of knowledge fit different stages of the policy cycle (Pawson et al., 2003, Jones et al., 2012):

- **Agenda-setting stage:** knowledge is used to assess need, identify new problems or chart existing practices;

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- **Policy formulation stage:** knowledge plays a role in structuring various alternative policy options, and in suggesting causal links between the policy and its outcomes;
  - **Policy implementation stage:** knowledge functions to monitor processes and improve the effectiveness of initiatives such as projects, programs and ongoing policies;
  - **Policy evaluation stage:** formal research to discover what works, why, when and how. Evidence feeds into new agendas and policy formulation.

The advantage of considering a purpose-based classification in terms of evidence-based policy-making is that it extends beyond scientific evidence-based knowledge, and includes local or indigenous knowledge, and tacit knowledge, which is important for the purposes of this study, as we will see later.

## 1.2 Rationale of the study, expected outcomes and analytical framework

This study is one of the deliverables of the Research for Policy Change in Southeast Asia and the Pacific project which is funded by the Australian Government Overseas Aid Program (AusAID) and is implemented by the Overseas Development Institute's (ODI) Research and Policy in Development (RAPID) program.<sup>2</sup> The study was conducted in a collaboration, led by the Social Development Research Centre (SDRC) of De La Salle University in Manila. It focuses on a relevant area of an AusAID program in the Philippines: disaster risk management and urban resilience.

The objective of the analysis is to better understand the factors that favour or hinder the use of scientific knowledge and research evidence in the design and implementation of urban resilience measures in selected areas of the Philippines. Contemporary academic discussion of urban resilience focuses on three distinct threats: climate change, natural disasters and terrorism. Our focus is on challenges and disasters specific to climate change, such as typhoons (also named tropical storms) and floods, as well as geo-hazards like earthquakes.

The audience of the study is development partners such as AusAID, supporting projects, programs and policy research on disaster risk reduction and climate change, non-government organisations (NGOs), and policy researchers who are interested in exploring the topic of evidence-based policy-making in the Philippines.

The expected outcomes of the study are:

- Constraints and enablers of linking scientific knowledge to policy decision-making processes are documented for use by the AusAID urban resilience team
- A methodology to conduct political economy studies of the use of knowledge in policy-making is tested
- A new collaboration between ODI and a local research institute to study the role of evidence, knowledge and research-evidence in policy processes is established
- Researchers in the Philippines are informed about the evidence-based policy in development network (ebpdn) and [www.ebpdn.org](http://www.ebpdn.org) and its potential for future knowledge sharing and research collaborations

The research was designed adopting the principles of political economy analysis seen through the lens of the use of knowledge in policy decision-making processes.

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<sup>2</sup> For almost a decade, ODI's RAPID program has been working to understand the relationship between research, policy and practice and to promote evidence-informed policy-making. The funding from AusAID runs from July 2011 – December 2012 and supports research and lessons learned on the links (or lack thereof) between knowledge and policy-making.

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Why political economy analysis? Because there is a growing recognition that politics matter in development and that technical analysis, which has traditionally been applied to the field of natural disaster risk management, needs to be complemented by a better understanding of the politics that are behind it (Eaton et al., 2010, Faustino and Fabella 2011). Furthermore, influencing policy through knowledge and research evidence must be recognised as a political process which involves a change in the balance of power between knowledge producers and users (Jones et al., 2012).

We define political economy analysis using the definition of Collinson (2003):

*Political economy analysis is concerned with the interaction of political and economic processes in a society: the distribution of power and wealth between different groups and individuals, and the processes that create, sustain and transform these relationships over time (Collinson p. 3).*

A political economy framework offers a number of potential benefits (Heider and Rao 2010, Booth 2012):

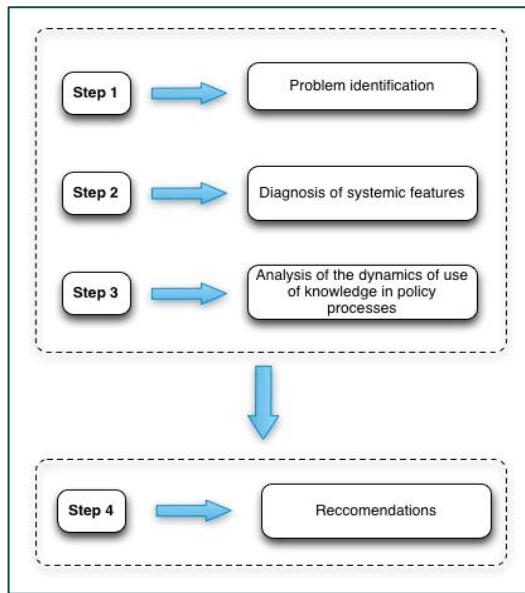
- It can help identify gaps in knowledge and challenge assumptions
- It can reaffirm the centrality of politics in development decision-making processes
- It emphasises the importance of understanding context-specific realities
- Focusing on institutions, it helps determine the incentive frameworks that induce patterns of behaviour
- It can provide an analytical approach which helps organise knowledge (tacit and other) into consistent stories
- By systematising knowledge, political economy analysis can also help facilitate knowledge sharing.

A political economy approach takes the local context as its starting point and focuses on identifying solutions and policy interventions which are technically sound and politically possible (Faustino and Fabella 2011).

The main research question of the study is:

Under what conditions are LGUs constrained from taking disaster mitigation/climate adaptation actions, in the face of evidence of hazards and risks in urban areas, to protect citizens? Conversely, under what conditions do LGUs use research evidence and knowledge to take such mitigation/adaptation measures?

### **Figure 1: Political economy analysis framework**



The political economy framework developed and applied to the study to answer the main research question is illustrated in Figure 1.

**Step 1 – Problem identification:** the aim was to identify the specific problem to be addressed by the study: are LGUs constrained from taking disaster mitigation/climate adaptation actions in the face of evidence of hazards and risks in urban areas to protect citizens? Conversely, do LGUs use research evidence and knowledge to take such mitigation/adaptation measures?

**Step 2 – Diagnosis of systemic features:** the analysis here focuses on the specific systemic features in place that define the problem identified above. This was done through the analysis of policy framework on urban resilience and a list of key policy actors in this area. Guiding questions of our analysis were:

- How have recent political and economic histories shaped policy processes at the local level in relation to urban resilience?
- What role do different actors (National Government, LGUs and non-state actors) play in designing and implementing urban resilience interventions?
- Which actors are the most influential in these processes, including at different stages?
- What are the formal and informal relationships between different policy actors at sub-national level and how do these shape the decision-making policy process? What kind and level of interaction exist between them?

**Step 3 – Dynamics for the use of knowledge in the policy process:** the aim was to understand the attitude towards scientific knowledge and the use of evidence in policy- and decision-making processes. The analysis looked at the incentives and attitudes that favour or hinder greater use of evidence in designing and implementing urban resilience interventions. The guiding questions were:

- What are the available types of knowledge? Are municipal administrations able to access/use this evidence? What types of knowledge do they use? Where are analyses, assessments and information (i.e. knowledge and evidence) used in decision-making processes on urban resilience? What is the context in the production and use of these?
- Who are the producers of knowledge relevant for urban resilience decision-making at sub-national level?

- 
- How are decisions framed? What are the ideas which everyone seems to support? What are the ‘unspeakable’ topics?
  - What are the incentives for use of knowledge/information for designing and implementing urban resilience interventions, and how do they shape decision-making dynamics?
  - How is ‘credibility’ achieved and wielded? Which actors are perceived to have expertise on policy issues (e.g. technical, political etc.) and why?
  - What other factors shape the use (or not) of information and research? (e.g. capacity, power dynamics, incentives etc.)? What is required to have policy processes (whether design or implementation) that are more ‘evidence-based’?

**Step 4 – Conclusions:** based on the results of the analysis conducted in steps 1 to 3, the aim here is to draw the main conclusions.

### 1.3 Research activities

The study began with an inception stage where the approach and analytical framework were introduced to SDRC and shared with AusAID in the form of a task definition, including the research plan and the agreed methodology.

A background policy review helped identify definitions of urban resilience, as well as mapping key policy documents and actors at national and sub-national level. The review helped identify specific interventions by development partners and NGOs and list examples of knowledge products that AusAID and other development partners have produced on urban resilience.

The data collection at sub-national level was conducted through focus group discussions and semi-structured interviews in seven LGUs: Albay (Bicol), Baguio City, Marikina (Metro Manila) in Luzon, Iloilo City and Cebu City in Central Visayas and Davao City and Cagayan de Oro in Mindanao (Figure 2).<sup>3</sup>

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<sup>3</sup> See also the map of the regions and provinces of the Philippines in Annex 1

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**Figure 2: Case study areas**



The choice of these case study areas is linked to the occurrence of natural disasters such as typhoons and volcanic eruptions and the experience of decision-making and local planning on climate change/urban resilience. Marikina and Cagayan de Oro have traditionally been considered typhoon-free, but had to suffer the consequences of Typhoons Ondoy in 2009 and Sendong in 2011. Iloilo and Cebu have had experience with disastrous floods brought about by Typhoon Frank, while Davao has had two episodes of El Nino-related flooding, in 2002 and 2011. Baguio was selected for its unique geographical location which is prone to landslides, and Tabaco is exposed to the risks of typhoons and volcanic eruptions.

Key informants for focus group discussions and interviews were identified in the LGUs to represent institutions or agencies involved in disaster risk reduction and management: Disaster Risk Reduction and Management Office (DRRMO), the Philippine National Police, Bureau of Fire Protection, City Health Office, Barangay Council, NGOs, civic organisations, City Administration Office, and City Agriculture Office.

A validation workshop was conducted on 7 May, 2012 at De La Salle University where the results of the fieldwork and analysis were presented and discussed. As well as study team members, participants to the validation included AusAID, an LGU and some government organisations involved in, among other things, disaster risk reduction: the Philippine Atmospheric, Geophysical & Astronomical Services Administration (PAGASA), the Department of Environment and National Resources (DENR), the Local Governance Academy and the Office of Civil Defence, both at the Department of the Interior and Local Government.

#### **1.4 Limitations of the research**

The analysis of this report must be seen in the light of some limitations: the case study areas, while covering the three main regions of the country, are not representatives of the whole country and; while research methodology sheds light on why some LGUs in the case study areas have been more successful than others in making use of various types of

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knowledge and research evidence to design urban resilience initiatives, these generalisations and hypotheses should be tested further in other areas of the country, under local circumstances.

While the report is a synthesis of seven study sites, we decided not to present separated case studies for each site. The process of data gathering, which relied on focus group discussions and interviews with key informants, was designed to elicit answers which would not be substantial enough for a detailed case study of each site, and were intended to develop a narrative, with examples of the evidence gathered in the different sites.

Contemporary academic discussion of urban resilience focuses on three distinct threats: climate change, natural disasters and terrorism. Our focus here is on challenges and disasters specific to climate change (e.g. typhoons or tropical cyclones) as well as geo-hazards like earthquakes.

## **1.5 Structure of the report**

Section 2 of this report sets out the context of urban resilience in the Philippines and presents the results of the review, and the definition of urban resilience chosen for this report. For readers who are not familiar with decentralisation reforms in the Philippines it provides a short description of the main policy guiding the reform and the structure of LGUs. The section includes results of the review of the main policies on urban resilience in the Philippines and the programs which development partners have been supporting. Section 3 presents results of the analysis of the data collected in the case study areas. Section 4 presents the main conclusions.

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## 2 Natural disasters and urban resilience in the Philippines: key definitions and policies

The Philippines are highly vulnerable to natural disasters and the impacts of climate change. During the period 1980 – 2010 the Philippines were hit by 363 disaster events (or 12.1 per year over the 30-year period). Table 1 is taken from data posted on Prevention Web<sup>4</sup> and shows the extent of human losses, number of people affected, and the economic damage incurred by the Philippines between 1980 and 2010.<sup>5</sup>

**Table 1: Data related to human and economic losses from disasters that occurred between 1980 and 2010**

No of events:	363
No of people killed:	32,956
Average killed per year:	1,063
No of people affected:	116,212,416
Average affected per year:	3,748,788
Economic Damage (US\$ X 1,000):	7,417,145
Economic Damage per year (US\$ X 1,000):	239,263

Source: OFDA/CRED International Disaster Database<sup>6</sup>

The occurrence of natural disasters over the same period shows that storms and floods (often associated to storms) are the biggest risks faced by the population (Figure 3).

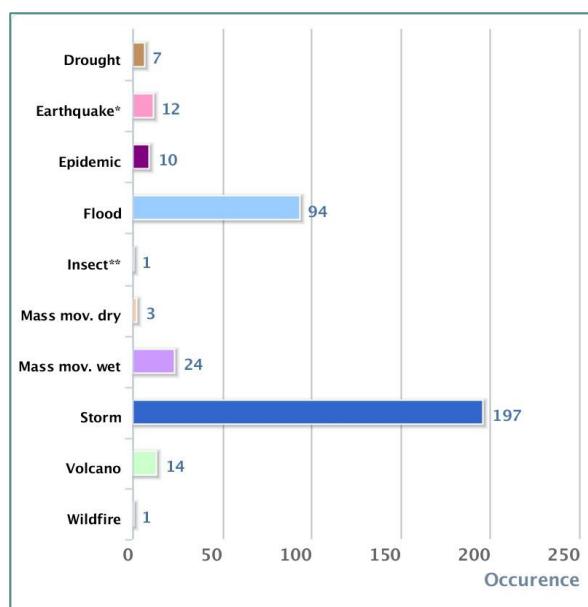
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<sup>4</sup> PreventionWeb – Philippines Disaster Statistics: <http://bit.ly/Ow7Jlu>

<sup>5</sup> PreventionWeb – Philippines Disaster Statistics: <http://bit.ly/Ow7Jlu>

<sup>6</sup> The OFDA/CRED International Disaster Database: "EM-DAT: The OFDA/CRED International Disaster Database, Université Catholique de Louvain, Brussels, Belgium. Data version: v11.08. More information and data on: [www.emdat.be/](http://www.emdat.be/)

**Figure 3: Occurrence of reported natural disasters in the Philippines 1980 - 2010**



Source: OFDA/CRED International Disaster Database

Storms and floods are the natural disasters which occur most in the Philippines, and the ones that affect the largest number of people when they do occur. More than six million people were affected by storms that hit the country in 1990. In recent years, the number of affected people increased to reach more than nine million in 2009 (Table 2).

**Table 2: Number of people affected by major natural disasters in the Philippines (1980 – 2010)**

Disaster	Date	Number of people affected
Storm	1990	6,159,569
Storm	2009	4,901,763
Storm	2008	4,785,460
Storm	2009	4,478,491
Storm	1998	3,902,424
Storm	2006	3,842,406
Storm	1988	3,250,208
Drought	1998	2,600,000
Storm	2006	2,562,517
Storm	2000	2,436,256

Source: OFDA/CRED International Disaster Database

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We can compare these figures with Japan, a country which has similar exposure to tropical storms and cyclones. While Japan has a national income per capita of US\$ 33,280<sup>7</sup>, which is about 9.4 times that of the Philippines at US\$ 3,504 (World Bank 2010), Japan has about 1.4 times as many people exposed to tropical cyclones than the Philippines. However, if affected by a cyclone of the same magnitude, mortality in the Philippines would be 17 times higher than in Japan (UNISDR 2009).

The OFDA/CRED International Disaster Database ranked the economic damages caused by major natural disasters in the Philippines for the period 1980-2010. Table 3 shows that damage caused by major storms, floods and earthquakes that hit the country have caused more than US\$ 3 billion economic damage.

**Table 3: Economic damage caused by major natural disasters  
1980 - 2010**

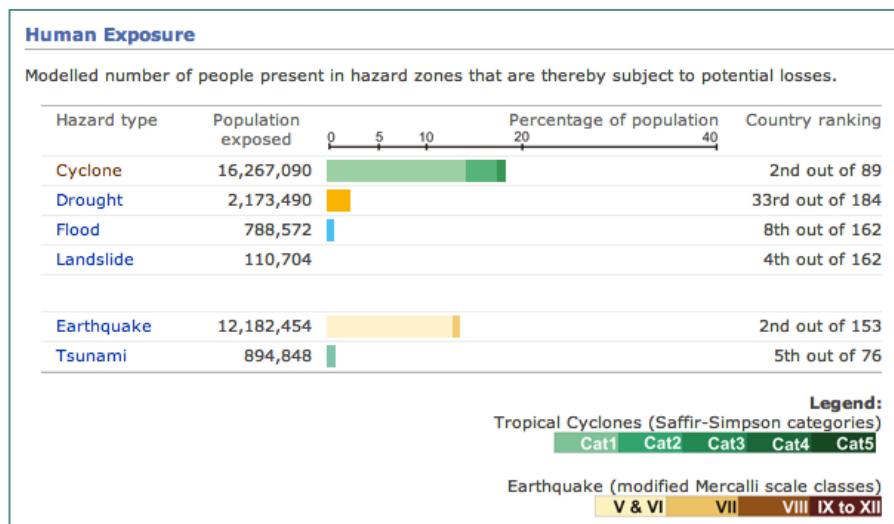
Disaster	Date	Cost (USD)
Flood	1995	700,300,000
Storm	2009	585,379,000
Storm	1990	388,500,000
Earthquake	1990	369,600,000
Storm	2008	284,694,000
Storm	2010	275,745,000
Storm	1995	244,000,000
Storm	1988	240,500,000
Storm	2009	237,489,000
Storm	1984	216,700,000
<b>Total</b>		<b>3,542,907,000</b>

The United Nations 2009 Global Report on Disaster Risk Reduction (UNISDR 2009) ranks the Philippines as the third most disaster-prone country in the world, with the largest number of people exposed and displaced annually due to natural disasters. Figure 4 below shows that the Philippines ranks quite high in the world in terms of human exposure to natural disasters, particularly when it comes to tropical cyclones.

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<sup>7</sup> At Purchasing Power Parity (PPP).

**Figure 4: Ranking of the Philippines on human exposure to natural disasters**



Source: UNISDR 2009 Global Assessment Report

Why is all this relevant for urban resilience?

The data about urbanisation show that the Philippines has one of the most urbanised populations in Southeast Asia. The estimate varies. UNICEF (2012)<sup>8</sup> estimates that 50% of the population (or 46 million people) live in urban areas, while United Nations figures show 76.7% of the population live in urban centres (UNDESA 2008)<sup>9</sup>. The percentage of the urban population in slums in the Philippines is 44% (or 22.8 million) (Homeless International 2012).<sup>10</sup>

If a large part of the population is exposed to natural disasters in the Philippines, and a large percentage of the population lives in urban areas, it can be assumed that the probability of the urban population living under the risk of natural disaster is high, which makes a compelling case for developing and strengthening urban resilience measures and policies. This is in line with the goal of the Disaster Risk Reduction Management program of AusAID, which is to strengthen community-based preparedness and reduce the vulnerability of the poor to natural disasters.

## 2.1 Key definitions used in the study

In this paper we define urban resilience as the ‘The ability of an urban system, community or society exposed to hazards to resist, absorb, accommodate and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions’ (UNISDR 2009).

We therefore refer to the capacity of a social system to contain the impacts of disasters and implement rehabilitative measures that reduce social interference (Brenuea et al., 2003). Under the Philippine Republic Act 10121, the term resilience is defined as:

The ability of a system, community or society exposed to hazards to resist, absorb, accommodate and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions. (Section 3 ff)

<sup>8</sup> UNICEF (2012) The State of the World's Children 2012: Children in an Urban World, Geneva: UNICEF.

<sup>9</sup> Sources: United Nations Department of Economic and Social Affairs, Population Division (2008) World Urbanization Prospects: The 2007 Revision, United Nations, New York; UN-Habitat, Urban Info 2008.

<sup>10</sup> Homeless International: data accessed on 2 August 2012 at <http://bit.ly/ODp9ch>

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Resilience calls for social units such as government, communities and organisations to adapt to climate change, which is at the root of natural disasters, rather than to resist them. It also requires collective efforts given the ‘different kinds and severities of risk, shock, stress or environmental change’ (Twigg 2009:8). This collective effort can be broken down into five main areas of resilience: (1) governance, (2) risk assessment, (3) knowledge and education, (4) risk management and vulnerability reduction, (5) disaster preparedness and response (Twigg 2009).

Related to the disaster discourse are climate change-related hazards and risks. The Intergovernmental Panel on Climate Change (IPCC) refers to climate change as a “statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period. Climate change may be due to natural processes or external forces or to persistent anthropogenic changes in the composition of the atmosphere or in land-use” (IPCC TAR 2001). The United Nations Framework Convention on Climate Change defines it as “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods” (UNFCCC 1 Section 2).

## **2.2 Main policies and reforms on disaster resilience in the Philippines**

Similar to other Southeast Asian countries, governance in the Philippines has traditionally been highly centralised (Brillantes and Moscare 2002). In 1991, the passage of Republic Act 7160 (also known as Local Government Code) marked the official start of decentralisation reforms which resulted in a substantial devolution of powers and functions to sub-national government units or LGUs. The reform opened up space for the active engagement of CSOs and citizens in local governance. This contributed to an increase in demand for locally generated evidence, as citizens look to their elected representatives for reforms that stimulate local development and accountable governance (Villarin 2004).

Owing to the decentralisation reform, LGUs (i.e. provinces, municipalities, cities and barangays, the smallest administrative unit in the Philippines) are given autonomy in carrying out specific administrative, economic and political functions (Llanto 2010). One such administrative function is the management of disasters (Shaw 2009).

Before the 1991 Local Government Code, disaster management was under Presidential Decree 1566 signed in 1978 by President Ferdinand Marcos. The Decree prescribed a mainly reactive and centralised management of natural disasters. It contained little in terms of proactive investments to reduce the damage from natural disasters. Today, on the contrary, when disasters occur, political and administrative units are mandated to use all possible resources available at the local level before seeking assistance from external entities and the central government.

Presidential Decree 1566 stipulated that the National Disaster Coordinating Council (NDCC) served as the policy-making body for disaster control management in the Philippines. The task of the NDCC was to advise the President on the status of preparedness programs, disaster operations and rehabilitation efforts undertaken by the government and private sectors. The secretary of national defence was the head of the council. Other members included the secretaries of public works, transportation and communications, social welfare and development, agriculture, education, finance, labour, justice, trade and industry, local government, health and natural resources. The Armed Forces chief of staff and the executive secretary were also NDCC members. The council was represented at regional, provincial and city/municipal level by local disaster coordinating councils. At municipality/city level, the mayor was the chairman of the local NDCC, with the Station Commander of the Integrated National Police as vice-chairperson and action officer.

In 2010, 34 years after Presidential Decree 1566, President Gloria Macapagal-Arroyo introduced new legislation that changed the way natural disasters are managed. Republic Act 10121, also known as the Philippine Disaster Risk Reduction and Management Act, aims at ‘strengthening the capacity of the local government units for disaster reduction and management through decentralised powers, responsibilities and resources at regional and local levels’ (see Section 2 (K) of RA 10121).

RA 10121 represents a major legislative shift. It introduced a different approach to managing natural disasters which includes more proactive responses and actions than in the past. One important organisational change to RA 10121 was the replacement of the old NDCC with the National Disaster Risk Reduction and Management Council (NDRRMC). The new Council includes a total of 36 organisations including public, non-government and private-sector organisations. This is an increase from 19 under the NDCC. Table 4 below shows the main differences between the NCDD and the NDRRMC. Unlike the NDCC, the NDRRMC has a permanent, rather than ad hoc, membership. It also requires the appointment of DRRM officers at sub-national level and the establishment of a DRRM office in the LGUs. A major difference between the NDCC and the NDRRMC is the task of developing a National Disaster Risk Reduction and Management Framework to provide a comprehensive, all hazards, multi-sectoral, inter-agency and community-based approach to disaster risk reduction and management.

**Table 4: Main differences between NCDD and NDRRMC**

	National Disaster Coordinating Council - NDCC	National Disaster Risk Reduction and Management Council- NDRRMC
Legislation	Presidential Decree 1566	Republic Act 10121
Year	1978	2010
Members	19 <sup>11</sup>	36 <sup>12</sup>
Chair	Defence Secretary	Defence Secretary

<sup>11</sup> Chairman: National Defence Secretary. Members: Secretary of the Department of Public Works and Highways, Secretary of the Department of Transportation and Communications, Secretary of the Department of Social Services and Development, Secretary of the Department of Agriculture, Secretary of the Department of Education, Culture and Sports, Secretary of the Department of Finance, Secretary of the Department of Labor and Employment, Secretary of the Department of Trade and Industry, Secretary of the Department of Local Government and Development, Secretary of the Department of Health, Secretary of the Department of Natural Resources, Secretary of the Department of Public Information, Secretary of the Department of Budget and Management, Secretary of the Department of Justice, Presidential Executive Assistant, Chief of Staff of the Armed Forces of the Philippines, Secretary-General of the Philippine National Red Cross, Administrator of the Office of Civil Defense.

<sup>12</sup> Members: Secretary of the Department of Health, Secretary of the Department of Environment and Natural Resources, Secretary of the Department of Agriculture, Secretary of the Department of Education, Secretary of the Department of Energy, Secretary of the Department of Finance, Secretary of the Department of Trade and Industry, Secretary of the Department of Transportation and Communication, Secretary of the Department of Budget and Management, Secretary of the Department of Public Works and Highways, Secretary of the Department of Foreign Affairs, Secretary of the Department of Justice, Secretary of the Department of Labor and Employment, Secretary of the Department of Tourism, the Secretary of the Office of the Presidential Adviser on the Peace Process, the Chairman of the Commission on Higher Education, the Chief of Staff of the Armed Forces of the Philippines, Chief of the Philippine National Police, the Press Secretary, Secretary-General of the Philippine Red Cross, Commissioner of the National Anti-Poverty Commission Victims of Disasters and Calamities Sector, Chairperson of the National Commission on the Role of Filipino Women, Chairman of the Housing and Urban Development Coordinating Council, the Executive Director of the Climate Change Office of the Climate Change Commission, the President of the Government Service Insurance System, the President of the Social Security System, the President of the Philippine Health Insurance Corporation, the President of the Union of Local Authorities of the Philippines, the President of the League of Provinces in the Philippines, the President of the League of Municipalities in the Philippines, the President of the League of Cities in the Philippines, the President of the Ligang Mga Barangay, four representatives from CSOs, one representative from the Private Sector, Administrator of the Office of Civil Defense

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Vice-chairs	Interior secretary as vice chairperson for disaster preparedness; Social welfare secretary as vice chairperson for disaster response Science and technology secretary as vice chairperson for disaster prevention and mitigation Socioeconomic planning secretary as vice chairperson for disaster rehabilitation and recovery
New members	Commissioner of the National Anti-Poverty Commission Victims of Disasters and Calamities Sector National Commission on the Role of Filipino Women Housing and Urban Development Coordinating Council Climate Change Office of the Climate Change Commission Government Service Insurance System Social Security System Philippine Health Insurance Corporation Union of Local Authorities of the Philippines League of Provinces in the Philippines League of Municipalities in the Philippines League of Cities in the Philippines Ligang Mga Barangay
Non-government members	Philippines Red Cross Four representatives of NGOs One representative of the private sector

With regard to the implementation of the directives included in RA 10121 at sub-national level, a number of LGUs have responded to the mandate of the RA 10121. The City of Makati (part of Metro Manila), for example, passed a City Ordinance creating its DRRM office, and allocating 5 million PHP (ca. 119.000 USD)<sup>13</sup> for its operations. The creation of the DRRM office advances the city's effort of championing city resilience. Makati City was recognised by the UNISDR as a Role Model City and Campaign Champion for Making Cities Resilient in 2011.<sup>14</sup> Another local government unit lauded for its DRRM is Bacolod City which was nominated for Gawad Kalasag 2012, a prize for excellence in DRRM and Humanitarian Assistance among highly urbanised cities. In 2009, the city was listed in the top three Gawad Kalasag Awardees.<sup>15</sup>

RA 10121 mandates national and local agencies to come up with participatory and proactive responses to, mitigation of, and preparation for disasters. This legislation reforms the management of disasters in the country from being reactive to being proactive. The National Disaster Risk Reduction and Management Plan as required by RA 10121 was finalised in 2011. It serves as a national guideline that articulates the goals and objectives of the country relative to its disaster management. The plan outlines the activities and programs planned and developed by NDRRMC to increase the capacity of, among other, LGUs and their partners (e.g. NGOs, CSOs and international organisations) in building disaster resilient communities. The plan defines the DRRM policy structures, institutions and coordination mechanisms required to achieve its objectives.

Both RA 10121 and the National Disaster Risk Reduction and Management Plan introduce and expand natural disaster risk reduction to areas such as gender, knowledge and education, the peace process and conflict resolution, climate change measures and

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<sup>13</sup> Exchange rate: 1 USD = 41.8008 PHP

<sup>14</sup> Reported in Phil Star, 2 July 2012

<sup>15</sup> Philippine Information Agency, 16 July 2012

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adaptation, and human rights. Disaster risk reduction management recognises and strengthens LGUs' capacity to mitigate, prepare, respond and recover from the impacts of disasters.

Under RA 10121, 5% of a calamity fund can be used for the pre-disaster phase, such as constructing infrastructure for flood mitigation, procurement of equipment and supplies, training, research, coaching and policy development. Under the new policy, disaster management involves four thematic sectors: (1) disaster preparedness, (2) response, (3) prevention and mitigation and (4) recovery and rehabilitation. However, the 5% calamity fund is not conditional to the establishment of a local DRRM unit.

While cities like Makati and Bacolod responded to RA 10121 by establishing a DRRM office, other LGUs did not. The delay in the implementation of DRRM at the local level can be attributed to various factors. One of the challenges of the current DRRM policy is the absence of incentives for local government units to create a DRRM office. LGUs can access 5% of the calamity fund to invest in disaster-related infrastructure, even without a local DRRM office. Tagum City in Davao del Norte, for example, passed City Ordinance No. 278 S-2011 which authorises the mayor to use funds from the annual budget for strengthening infrastructure, including construction and rehabilitation of drainage canals, preparedness activities and other mitigating measures. However, in the absence of a DRRM office, the ordinance does not specify who is responsible for managing the funds.

Another difficulty in implementing the RA 10121 in relation to the 5% calamity fund is the issue of fund appropriation. The Municipality of Corella in the province of Bohol filed a resolution requesting that its district representative in the national Congress repeal RA 10121. Under the current law, "unexpended balance" of the 5% calamity fund must be carried over and can only be used for disaster risk reduction management activities and programs for the next five years. However, the Corella Municipality considers such a provision restraining given its limited financial resources.

Importantly for our study, RA 10121 highlights the importance of the use of scientific knowledge in the form of strengthening and developing information systems and geographic information systems to build risk maps. The use of early warning systems is incorporated in RA 10121 and defined as knowledge of the risks, monitoring, analysis and forecasting of the hazards, communication or dissemination of alerts and warnings, and local capabilities to respond to the warnings.

Risk assessment, hazard mapping, public information and education, warning and forecasting capabilities are mandatory to ensure that disaster risks are properly managed. As defined by the law, risk assessment includes a review of the technical features of hazards in the area, analysis of exposure and vulnerability, and evaluation of the effectiveness of existing coping capacities. The law also promotes the use of information systems and geographic information systems in the creation of a national risk map to be used in policy, planning and decision-making formulation.

Overall, RA 10121 represents landmark legislation on disaster risk reduction and management in the Philippines. It institutionalises the country's system and framework for disaster risk reduction and management. This legislation seeks to provide holistic, participatory, institutionalised and proactive responses to abate the impacts of disasters and climate change. It superimposes the collaborative roles of national government agencies, LGUs and NGOs in building resilient communities.

Other laws relevant for urban resilience are:

- Republic Act 9729 or the Philippine Climate Change Act of 2009: also known as the Republic Act 9729 of 2009, the Philippine Climate Change Act mandates the integration of the climate change agenda in government policy

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formulations and the establishment of a framework strategy and programs relating to climate change. In relation to disaster risk reduction and management, the Climate Change Commission, established under this law, is mandated to coordinate with the National Disaster Risk Reduction Management Council (NDRRMC) to increase efficiency and effectiveness in abating people's susceptibility to climate-related disaster.

- Executive Order 832: signed by the then President Gloria Macapagal-Arroyo on 12 October 2009, created the Special National Public-Private Reconstruction Commission (SNPPRC) tasked with identifying recovery measures and estimating the cost of reconstruction following typhoons Ondoy, Pepeng and Frank. Specifically, the commission is mandated to design a rehabilitation plan for infrastructure, raise funds or grants for reconstruction, oversee implementation of rehabilitative services, and act as a clearing house for international assistance.
- Executive Order 66: states the rules on the cancellation and suspension of classes in private and public educational institutions at all levels, and work in government offices due to disasters. E.O. 66 also stipulates that government offices directly involved in disaster risk reduction and management shall maintain their operations to ensure that the needs of those affected are met. These offices are Office of the Executive Secretary, Department of National Defence, Department of Interior and Local Government, Department of Social Welfare and Development, Department of Science and Technology, Department of Health, Department of Public Works and Highways, Department of Education, and other offices whose services may be needed in times of disasters.
- Executive Order No. 888: this policy endorses the Strategic National Action Plan of 2009-2019 (SNAP) on disaster risk reduction. Different social sectors, including the government, NGOs, civil society groups, professional associations, academics and scholars were involved in creating the plan. It serves as a master plan or road map for disaster mitigation and provides a list of priority areas in disaster management, as well as the government agencies tasked with carrying out different projects and programs.

There are also a number of memorandum circulars that support the implementation of RA 10121:

- OCD Memorandum Circular 079s. 2011 sets out the guidelines and criteria in reporting disaster incidents;
- NDRRMC Memorandum No. 17, s. 2011 creates the NDRRMC Scientific Research and Risk Assessment Committee Relative to the Flash flood Disaster in Cagayan de Oro City and Iligan City, brought about by Tropical Storm Sendong in January 2012 (Washi);
- NDRRMC Memorandum No. 03, s. 2012 provides guidelines for the selection of representatives from Civil Society Organisations (CSOs) to the National and Local DRRM Councils;
- NDRRMC Memorandum No. 04, s.2012 includes implementing guidelines on the use of an Incident Command System (ICS) on an on-scene disaster response and management mechanism under the Philippine Disaster Risk Reduction and Management System.

## **2.3 Key government institutions involved in natural disaster resilience**

As discussed, the NDRRMC serves as the national policy-making and coordinating body of the Philippine government on disaster risk reduction and management. The council is mandated to manage existing disaster risk reduction-related programs, services and

activities. Specifically, it is responsible for designing risk assessment and early warning measures, and disaster risk communication, reduction, mitigation, rehabilitation and preparation.

An important member of the NDRRMC is the Office of Civil Defence (OCD). The OCD is part of the Department of National Defence (DND) and acts as the administrative secretariat, advisory and implementing office of the NDRRMC. The other four leading government bodies that play major roles in the NDRRMC are the Department of Science and Technology (DOST) which is responsible for prevention and mitigation, the Department of Interior and Local Government (DILG), responsible for disaster preparedness, the Department of Social Welfare and Development (DSWD), responsible for disaster response, and the National Economic Development Authority (NEDA) responsible for rehabilitation and recovery from natural disasters.

The Department of Environment and Natural Resources (DENR), the Department of Public Works and Highways (DPWH), the Department of Finance (DOF), the Philippine Information Agency (PIA), the Department of Health (DOH), and the National Housing Authority (NHA) also support the implementation of DRRM programs, services and activities (See Tables below for a list of government units/offices and their roles in DRRM).

**Table 5: Government agencies with mandate on disaster risk prevention and mitigation**

<b>Prevention and Mitigation</b> <b>Lead Agency: Department of Science and Technology</b>	
OCD	Mainstream DRRM and Climate Change Adaptation in national, sectoral, regional and local development policies, plans and budgets. Conduct community-based and scientific-based DRRM and CCA assessment, mapping, analysis and monitoring
DENR	Develop DRRM and Climate Change Adaptation-sensitive environmental management
DPWH	Increase disaster resilience of infrastructure system
DOF	Provide access of communities to effective and applicable disaster risk financing and insurance
DOST	Conduct end-to-end monitoring, forecasting and early warning systems

Source: *The National Disaster Risk Reduction and Management Plan, 2011*

**Table 6: Government agencies with mandate on disaster preparedness**

<b>Disaster Preparedness</b> <b>Lead Agency: Department of Interior and Local Government</b>	
PIA	Increase level of awareness and enhance capacity of communities to the threats and impacts of all hazards
DILG and OCD	Equip communities with necessary skills and capability to cope with the impacts of disaster. Develop and implement comprehensive national and local preparedness and response policies, plans and systems
DILG	Increase DRRM and Climate Change Adaptation capacity of Local DRRM Councils and Offices at all levels. Strengthen partnership and coordination among

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all key players and stakeholders

Source: *The National Disaster Risk Reduction and Management Plan, 2011*

**Table 7: Government agencies with mandate on disaster response**

Disaster Response Lead Agency: Department of Social Welfare and Development	
DSWD	Establish effective disaster response operations. Provide temporary shelter needs. Implement coordinated and integrated system for early recovery at national and local levels
DRRMCs, OCD, DSWD	Conduct adequate and prompt assessment of needs and damages at all levels
DND, DILG, DOH	Integrate and coordinate search, rescue and retrieval capacity
LGUs	Evacuate affected communities safely and timely
DOH	Attend to basic social needs of affected population. Promote psycho-social wellbeing and reduce mental health problems and risks

Source: *The National Disaster Risk Reduction and Management Plan, 2011*

**Table 8: Government agencies with mandate on disaster rehabilitation and recovery**

Rehabilitation and Recovery Lead Agency: National Economic Development Authority	
OCD	Assess damages, losses and needs
NHA	Mainstream DRRM and CCA elements in human settlement
DPWH	Reconstruct disaster and climate change-resilient infrastructure
DOH and DSWD	Restore normal functioning of affected population

Source: *The National Disaster Risk Reduction and Management Plan, 2011*

## 2.4 NGOs in the Philippines engaged in disaster risk reduction and management

There are several NGOs engaged in disaster risk reduction and management in the Philippines. Their services include technical support and capacity building, relief response, disaster preparedness and mitigation and advocacy, among others.

**Table 9: NGOs in the Philippines engaged in disaster management**

Name	Activities
Aksyon Bayan Kontra Disaster, Inc (ABKD)	Assistance to barangays and communities in urban centres to manage disaster risks and to serve as a pressure group for disaster resilient urban communities
Centre for Disaster Preparedness	To promote community-based disaster risk management
Centre for Initiatives & Research on Climate Change Adaptation (CIRCA)	To enhance resilience among residents in the province of Albay to climatic risks, and to strengthen research capacity and project implementation in the context of climate change adaptation
Christian Aid Philippines	To assist at-risk communities to adapt to disasters and cope with the impacts of climate change
Corporate Network for Disaster Response (CNDR)	To institutionalise disaster risk management efforts of the business community and to implement various community-based disaster preparedness projects
Earthquake and Megacities Initiative	To promote urban risk reduction policy, knowledge and practice in megacities and metropolises To facilitate scientific and technical knowledge on urban disaster risk reduction and management
Philippine National Red Cross	To provide relief assistance in times of disasters and to implement mechanisms for disaster prevention, mitigation and preparedness
Philippine Relief and Development Services	To provide technical assistance to local churches on disaster management and to respond through relief services such as housing and other basic needs
PhilDHRRRA	To address agrarian reform and rural development including disaster-related risks

## 2.5 Disaster risk reduction and management programs with financial/technical assistance from international agencies

International donor agencies play an imperative role in upgrading disaster risk reduction and management of the Philippine government. They provide both technical and financial support to national government agencies. Most of the funded projects focus on disaster preparedness (e.g. technical assistance, risk/needs assessments, loans, forecasting capability), rehabilitation (e.g. infrastructure reconstruction) and response (e.g. relief operations).

**Table 10: International funding agencies and their disaster-related projects in the Philippines**

Donor	Project
Asian Development Bank	Post-Disaster Needs Assessment (PDNA) Process for Typhoons Ondoy and Pepeng  Southern Leyte Landslide Disaster Assistance Project
AusAID	Safer Communities Project  Technical links for disaster and climate risk management  Emergency and humanitarian response  Multi-Agency Hazard Mapping and Assessment for Effective Community Based Disaster Risk Management (READY) project
Agencia Espanola de Cooperacion Internacional para el Desarrollo (AECID)	Temporary housing evacuation of Typhoon Washi survivors  Strengthening local governments in the Philippines on DRRM and CCA  Strengthening the disaster risk reduction capacity of LGUs affected by Typhoon Parma, to be implemented in San Jose City, the Municipalities of Carranglan, Pantabangan, Rizal and Llanera, all in the province of Nueva Ecija
European Commission Humanitarian Aid Department Disaster Preparedness Program	Mainstreaming Disaster Risk Reduction in Sustainable Development: Land Use/Physical Planning in the Philippines  Safe Hospitals in Emergencies and Disasters: Philippine Indicators for Level 1 to 4 Hospitals  Disaster Preparedness in the Philippines
IBM International	Emergency Response Network
JICA	Upgrading the Forecasting Capability of the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) and the Philippine Institute of Volcanology and Seismology (PHILVOCS)  Project for the Rehabilitation of Flood Forecasting and Warning System in the Pampanga and Agno River Basins  Project for Flood Disaster Mitigation in Camiguin Island
UN Agencies	Improvement of Methodologies for Assessing the Socio-Economic Impact of Hydro-Meteorological Disasters  Mainstreaming Disaster Risk Reduction in Sustainable Development: Land Use/Physical Planning in the Philippines
USAID	Program for the Enhancement of Emergency Response (PEER) Phase III
World Bank	Disaster Risk Management Policy Loan with a Catastrophe Deferred Drawdown Option Program

## Integrating Flood Risk Management into Local Planning

There are also programs and projects funded by international organisations in coordination with LGUs. The Earthquake and Megacities Initiative is at the forefront in promoting the use of science and knowledge in developing resilient urban communities in the Philippines, in particular, and in South East Asia in general. By and large, most of the projects being funded by donor agencies at the local level are geared towards disaster preparedness.

**Table 11: International Funding Agencies and LGU Projects**

Funding Agency	Project	Objectives	Partner Agency
AusAID	BRACE (Building the Resilience and Awareness of Metro Manila Communities to Natural Disaster and Climate Change Impacts) Pilot Program	To create digital elevation maps for risk and vulnerability modelling for flooding, earthquakes and high wind  To improve drainage systems to ensure non-congested canals and waterways	Taguig City Government
Cities Development Initiative for Asia	Urban Renewal, Drainage, Wastewater Management	To improve living conditions in low-income areas along the river through reduced flooding and cleaner environment	Naga City
Earthquake and Megacities Initiative	Resilience to Earthquakes and Floods Project	To identify institutional goals and standards, to evaluate disaster management plan and to institutionalise disaster risk management strategy and action plan	Pasig City Government
	Physical Risk Cluster of Makati Risk-Sensitive Urban Redevelopment Planning Project	To conduct a comprehensive building inventory and structural assessment of buildings and other physical infrastructures in Barangay Rizal, Makati City	Makati City Government
JICA	Iloilo Flood Control Project II	To improve the living environments and sanitary conditions of local residents	Iloilo City
UN-HABITAT	Strengthening Philippine City Capacities to Address Climate Change Impacts	To design and develop appropriate social and physical infrastructure for Sorsogon City to become climate change resilient, through the implementation of a climate change responsive city shelter plan	Sorsogon City Government
UN	Online Local Government Self-Assessment Tool	To help appraise urban hazards through identifying planning and investment gaps for risk reduction and climate change adaptation	Quezon City Government
USAID	Emergency Relief, Early Recovery and Rehabilitation	To provide funds for the procurement of classroom furniture and supplies and restoration of schools  To provide funds for small-scale	Cagayan de Oro City

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infrastructure projects in the affected  
barangays

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In his third State of the Nation address to the Congress of the Philippines on 23 July 2012, President Benigno S. Aquino addressed the importance of disaster risk reduction and management, as well as the results achieved so far. He highlighted four key areas that need to be addressed by the country's public and private institutions: (i) continue implementing the ongoing projects to prepare for typhoons; (ii) continue developing technology and systems that allow improvements to early warning and monitoring; (iii) improve the sustainable management of forest land, farmland and livelihoods; and (iv) define the role of the private sector in planting trees and cash crops that can help protect people and reduce the effects of flooding.

In his national address President Aquino said, 'today, even when the storm is still brewing, we already know how to craft clear plans to avoid catastrophe' and 'before, agencies with shared responsibilities would work separately, with little coordination or cooperation. Now, the culture of government is *bayanihan*—a coming together for the sake of the people. This is what we call Convergence'.<sup>16</sup>

In the next section we look at the analysis of the realities at sub-national level, examined through the lens of the use of knowledge in policy decision-making DRRM.

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<sup>16</sup> Official Gazette of the Republic of the Philippines, State of the Nation Address of His Excellency Benigno S. Aquino III, President of the Philippines, to the Congress of the Philippines. Edited at the Office of the President of the Philippines Under Commonwealth Act No. 638

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# **3 Urban resilience at sub-national level: analysis of the local level investigation**

Policy-making in the Philippines must follow a structured process involving several mechanisms that enable partnerships between and among government agencies, NGOs, the private sector and grassroots-based organisations.

There is a high level of social capital prevailing vis-à-vis many policy issues, such as the environment, and during calamities, where civil society actors have shown themselves able to act collectively and, when needed, autonomously. However, as shown in this paper, with regard to DRRM, this somewhat encouraging picture is weakened by a weak link between scientific knowledge on one hand, and the policy process on the other.

While in recent years, as shown by the words of President Aquino, natural calamities and disasters have increased their presence in the policy agenda and discourse, the parts of the country which have been affected by natural disasters have also been affected by man-made environmental degradation and destruction. The policy discourse, both at the level of public demand and response from the state, seems to be shaped more in the context of an environmental solution (i.e. reforestation) to prevent or minimize the occurrence of floods, than in terms of the broader discourse of resilience.

The passage of RA 10121 in 2010 introduced a more holistic approach to DRRM as well as a new policy discourse. This change is captured by the change in name of the national agency tasked to coordinate disaster management efforts, from the National Disaster Coordinating Council (NDCC) which was tasked simply to “coordinate,” to the National Disaster Risk Reduction and Management Council (NDRRMC), now focusing on “reducing risks” and “managing” both the process of reducing risks, as well as disasters as a whole. So far however, despite changes in the law and the introduction of new provisions, our research reveals that the perception by key informants is that the provisions of the law are yet to be matched by changes on the ground in terms of institutions, plans and actions. This is indicative of a system that remains centralised, and where national agencies tasked with implementing the changes are unable to operationalise them at the local level.

RA 10121 is explicitly aligned with the principles of decentralisation and devolution, and has provisions that mandate LGUs, including urban areas LGUs, to devise their own DRRM strategies and policies. The policy driver is still located at the national level. Local initiatives still refer to the adoption (rather than adaptation) of national mechanisms and processes, although it may still be too early to assess the impact of RA 10121.

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The result is not a uniform response at sub-national level, as the rate and quality of the policy response is dependent on the experience of LGUs in disasters, as well as the quality of local political leadership. Different interpretations of the law at the local level have caused delays in the implementation of RA 10121. Local officers are not always knowledgeable enough of new legislation on disaster risk management. Furthermore, attempts have been made to create local capacity to respond better to disasters, but most LGUs are not yet fully equipped with the technical skills required to fully implement it. The main problems seem to be limited capacity on making use of local data at LGU level, in line agencies such as the Environment and Rural Development (EnRD). For example, in its evaluation of its programs in Leyte and Samar, EnRD reports that ‘municipalities do not have sufficient capacity to deal with natural hazards. They lack expertise, robust local data, management capacity and the funds to plan and implement well-targeted risk reduction measures’.<sup>17</sup>

OCD is still conducting orientation seminars at the LGU level and some results can already be seen. There is limited knowledge and understanding of the efficacy of LGU initiatives to implement RA 10121 at the sub-national level. Following a training seminar provided by OCD in Region IX (Zamboanga Peninsula in Mindanao) many mayors realised the full scope of the NDRRMC. One of the mayors said, ‘I am very happy to learn in the seminar that the calamity fund can be used even if there are no calamity occurrences. Usually, the unexpended calamity fund is reverted back to the general fund if it is not being used’ (in Corgue 2011). Since 2011, the OCD has been conducting orientation seminars with LGUs to enhance the capacity of local officials on planning and developing DRRM (PIA, 2012).

It is still too early to assess the impact of RA 10121 at the sub-national level, and that is not the intention of this study. It appears there is still a view that the national government represents a super-body that is expected to provide necessary resources. At the same time, the legislation has introduced mechanisms through which LGUs are expected to lend assistance and support to lower local government units in the following hierarchical order: national government to provinces and chartered cities, provinces to municipalities, and municipalities to barangays.

### **3.1 Policy decision-making, political constituencies, relationships between policy actors**

Our case studies reveal, not surprisingly, that a history of being a disaster-prone area means a higher level of awareness among people of the risks associated with natural disasters. This awareness is an important, but not sufficient, political condition for implementing and adopting DRRM measures and systems. Even prior to RA 10121, there was a culture of preparedness/readiness among the people of Tabaco (province of Albay), which has a history of being exposed to typhoons and eruptions of Volcano Mayon (Figure 5).

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<sup>17</sup> Source: EnRD Website <http://www.enrdph.org/>

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**Figure 5: Volcano Mayon seen from Legazpi City, Province of Albay**



*Photo: Arnaldo Pellini*

However, we found that the presence of these threats to citizens and their economic interests does not result in concrete policy actions. In the case of Marikina, we found that being located over the Marikina Fault, and being under considerable threat from earthquakes, has not led to concrete action, as seen in the aftermath of Typhoon Ondoy which hit Marikina in 2009 (Figure 6).

**Figure 6: Floods in Marikina caused by Typhoon Ondoy in 2009**



*Photo: <http://www.pinoymoneytalk.com>*

The actual experience of a natural disaster, with significant effects on lives and livelihoods, seems to be a necessary and sufficient condition for action and reaction.

Perception of low risk could even lead to the absence of policy action. The western part of Mindanao has been traditionally considered a typhoon-free part of the country, a message used to attract investment in the province (see map in Annex 2). However, in 2011 the city and municipality of Cagayan de Oro was hit by Typhoon Sendong (Figure 7) and Davao City by severe floods. The actual experience of natural disasters served as an impetus toward a more deliberate effort to craft policies to strengthen local DRRM. We found the same type of reaction when we talked with officials in Baguio who remember the 1990 earthquake, Marikina in the aftermath of Typhoon Ondoy, and Iloilo and Cebu after Typhoon Frank.

**Figure 7: Devastation caused by Typhoon Sendong in Cagayan de Oro, December 2011**



*Photo: [Mindanews.com](#), National Grid Corporation of the Philippines (NGCP), Narteal/Malacañang Photo Bureau/PNA)*

Our study shows there are political factors that contribute to concrete actions and responses, compared to situations where legislation is in place but not fully implemented to address natural disasters and build resilience. For example, in the province of Albay (where the city of Tabaco is located) Governor Jose Clemente "Joey" Salceda was able to turn disasters, and the need to prepare for natural disasters as a source of political capital, around, and was able to create not only a constituency, but develop policy mechanisms that address natural disaster resilience. Our findings reveal that the element of agency should be decoupled from the concept of good governance. Urban resilience interventions and policies by LGUs are not (necessarily) linked to good governance. For example, cities like Marikina, which has been recognised as a local government unit with remarkable governance mechanisms, did not develop a resilience system and policies comparable to the one in Albay, and introduced policies and DRRM plans following the devastation caused by Typhoon Ondoy. The key difference between the experience in Albay and that of Marikina is not the quality of governance but rather the leadership role of the Governor, who understood that he could gain political capital by addressing the issues of natural disasters and resilience.

From our case studies, we found that the experience of Albay is more an exception than the rule. The mere presence of a natural disaster threat does not necessarily help build political capital during, for example, election campaigns. There is usually limited disagreement between candidates in local elections about the need to be prepared against natural disasters. This, as discussed earlier, does not mean that action and policies are taken, and when disasters occur, they can be the defining moment of an elected official's political career, depending on how the public perceives his or her management of the emergency.

Disasters can provide an opportunity for political gain. The exceptions are disaster-prone areas with strong and aware leadership, as in the case of Albay and, to some extent, Iloilo City. At these times, it is not a domain for contentious politics, and no rational politician would ever oppose any policy that would promote resilience to disasters.

Urban LGUs are involved in both the formulation and implementation of policies. While LGUs usually respond to national directives, they are expected not just to adopt, but to adapt, national directives to the local context and needs. We found that some mayors have established City Disaster Risk Reduction and Management Councils (CDRRMC) in response to RA 10121. These initiatives are complemented by city ordinances, as in the case of Cagayan de Oro, Marikina, Davao and Baguio, that define guidelines for disaster response but do not develop comprehensive plans as envisioned by RA 10121. In the cities of Marikina, Tabaco, Davao and Cebu, ordinances to create the CDRRMC are being developed.

There is evidence of LGUs establishing partnerships with other LGUs and organisations. For example, faced with the problem of lack of weather predicting equipment, the LGUs of Cagayan de Oro and Bukidnon entered into an agreement with the national army to collect rainfall statistics in army camps, especially during times of heavy rain. This early warning system, while not totally scientific, is evidence of how local organisations improvise with disaster preparation strategies. In Davao City we visited barangay Matina Pangil which is

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located on the outskirts of the city towards the hills, and which was affected by flash floods in 2011. It has developed an early warning system to measure rainfall and the increase in the water level in the river that cuts across the barangay (Figure 8).

**Figure 8: Barangay Matina Pangil (Davao) measures for preparing a rapid response to floods include: rainfall measurements station, emergency and rescue material, a bamboo stick to measure the increase in the river level**



*Photo: Arnaldo Pellini*

Other actors are involved in specific aspects of urban resilience policies and interventions. The local and national offices of the Philippine National Police are involved, as well as national government agencies, such as the Department of Social Welfare and Development (DSWD) and the Department of Interior and Local Government (DILG), by augmenting local disaster response capacity. Science-based agencies like DOST, PHILVOCS, and PAGASA are consulted in the creation of geo-hazard maps by DENR's Geo Sciences Bureau and NAMRIA. Volunteer communications groups such as Davao Central 911, Marikina Rescue 161 and Baguio 191 are piloting innovative ways to respond to emergencies, while NGOs contribute to volunteers' work during emergencies.

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**Figure 9: Davao City 911 Emergency Centre**



*Photo: Arnaldo Pellini*

The example above shows that under RA 10121 private sector and civil society organisations are mostly involved in responses to natural disasters, although their mandate and skills may be better suited for crafting and implementing policy interventions that aim to prepare citizens, infrastructures and natural resources for natural disasters.

While RA 10121 encourages local initiatives, the practice reveals that policies are nationally provided, which is characteristic of a top-down approach. The law already identifies agencies that need to be involved. It also specifies and defines the relationship among actors, particularly on who reports to whom, who decides, and who calls the shots. This is established and well-known, and has been institutionalised as a formalised routine. Other agencies such as volunteer groups are involved through the institutionalisation of formal partnerships. In Davao and Baguio, for example, informal relationships involving volunteers have to be formalised through the signing of Memorandums of Agreement between LGUs and volunteers. Partnerships among government agencies remain *ad hoc* initiatives. In Cagayan de Orothe, the LGU partnered with the military camps located upstream in the Cagayan River in Bukidnon for weather reporting. There is a natural tendency for people and institutions to enter into partnerships during times of disaster.

Despite the definition of roles and responsibilities of various actors stipulated in the law, and the coming together at times of disasters, there are still gaps in the interaction between agencies. The current legislation does not include provisions to coordinate the support LGUs can provide to nearby LGUs. This does not mean that help and support is not provided. When the main access road to the centre of Barangay Matina Pangi, near Davao City, was cut off by flash floods in 2011, nearby barangays cleared smaller access roads to bring help and support. However, current legislation is focused on internal response structures and mechanisms. Experience with actual disasters highlights the need to re-examine the internally-focused response, considering there is a high probability that those who are tasked to respond at the local level are also affected. There is a need to articulate a policy in terms of when and how other LGUs can respond automatically, that is, in institutionalising the externalisation of disaster response when there is a judgment that a particular area is already seen as isolated and disabled.

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From among the different actors involved, the national government agencies were seen as the most influential in the formulation of policies, even as local executive officers were seen to have influence in all stages of dealing with disasters, from preparation, to response to rehabilitation, and in the formulation of policies and intervention mechanisms associated with these tasks.

### **3.2 Dynamics of the use of knowledge in the natural disaster risk reduction decision-making processes**

Jones at al. (2012) refer to Davies (2004) to argue that poor knowledge of policy links can give rise to policies and programs that reflect biases of individuals or groups, rely on untested views and draw selectively on pieces of knowledge to support ideological standpoints and decisions made behind closed doors.

Until recently the role of knowledge in the policy decision-making process was thought to be in the form of expert and high quality analysis providing an input to the policy process in a neutral way (Jones et al., 2012). This neutrality is now being questioned as evidence shows that policy-makers rely on more than just scientific knowledge to make policy decisions.

Jones at al. (*ibid.*) identify three types of knowledge which are used in policy-making (*ibid.* p. 86):

- **Research-based knowledge:** knowledge sourced according to the best protocols of research and the requirements of individual specialisations (i.e. disciplines)
- **Practice-informed knowledge:** knowledge from experience of implementing policy and practice. This includes strategic knowledge, forward looking (i.e. appraisals), current (i.e. monitoring), and backward-looking (i.e. evaluation) knowledge. Practice-informed knowledge incorporates tacit and experimental knowledge, ideas around appraising and demonstrating impact, as well as ideas of value for money and cost-effectiveness.
- **Citizens' knowledge:** knowledge held by citizens, both individually and collectively, drawing on their daily experience.

Davies (2005 in Jones et al., 2012) argues that policy-makers rely on different types of knowledge, and often a combination of different types. So, even when scientific knowledge does inform the policy process, it is as one among different types of knowledge, and one of the many inputs that influence the policy decision-making process.

We refer to scientific knowledge, by which we mean **research-based knowledge** and **practice-informed knowledge**, which is research-based and derived from the use of rigorous scientific methods, and which may or may not be produced by an academic institution. Our hypothesis is that academic institutions in the Philippines have the potential to play an important role in linking knowledge to policy processes through their research. As local stakeholders whose economic and financial standing would be threatened by the occurrence of disasters, local academic institutions should have an incentive to be involved in policy analysis and the appraisals, monitoring and evaluation of policy reforms. However, our analysis suggests that the engagement of local colleges and universities in natural disaster and disaster risk management policy research is more of an exception than a rule.

We found only two academic institutions involved in the policy-making process. In Cagayan de Oro, following Typhoon Sendong in 2011, Xavier University took the step to institutionalise research and advocacy on climate change and natural disasters. While LGU officials have demanded more access to research evidence that would support their decision-making process, they have not been actively involved in the development of the

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research agenda. Therefore, the initiative by Xavier University can be defined as an autonomous academic response influenced by requests for assistance by an LGU.

A second example is from the province of Albay where a Climate Change Academy has been established at Bicol University. The establishment of the academy was facilitated through the leadership of the Provincial Governor, who is conscious that his province is prone to disasters due to the threat posed by typhoons from the Pacific, as well as Volcano Mayon. While it was not part of the general scope of this research, it would be interesting for future investigations to look at why there are not more of these examples by other academic institutions in other areas like Iloilo, Cebu, Davao and Baguio, where there are reputable academic institutions.

The current legislation, developed as a result of RA 10121, envisions an ideal situation where scientific information is used in the design of intervention mechanisms and in crafting policies on disasters at the sub-national level. Our research reveals one particular instance where scientific information is used: geo-hazard maps are regularly used in the formulation of City Land Use Plans (CLUP). A second example involves information and regular updates, which are disseminated by government agencies, such as PAGASA and PHILVOCS, when natural disaster occurs or to inform people about the arrival of a typhoon.

Our interviewees expressed an almost uniform negative opinion of the information and service provided by PAGASA. The agency is perceived as inefficient and inaccurate. The mistrust in the quality of the scientific information provided by PAGASA means that LGUs may not take action when information is disseminated. Rightly or wrongly, PAGASA is perceived to have been wrong in forecasting and informing the citizens of Cagayan De Oro ahead of the arrival of Typhoon Sendong. Similar experiences and perceptions in the past have led Cagayan De Oro, Marikina and Cebu, for example, to rely on other websites for their weather forecasts.

There are several initiatives by national agencies to introduce innovation in the use of scientific knowledge in selected areas, including those that will increase the capacity of LGUs to deal with disasters. The development of hazard maps in 27 provinces is being implemented by PAGASA in collaboration with PHIVOLCS, with funding from UNDP and AusAID. The effort began in 2006, to conclude in May 2012. It is noteworthy that community-based early warning systems are now in place in several local communities, where trained volunteers do their own observations and forecasting. In the event of typhoons in municipalities within the river basins, communities located in the downstream coordinate with LGUs in upstream areas. This will help estimate expected rainfall in low-lying areas. PAGASA argues that this project is particularly relevant to test and pilot ways for developing localised warning systems.

Geo-hazard maps are very useful in identifying urban areas which are exposed to natural disasters, and where communities live. Relocation, however, is a very difficult topic to address. According to Dr. Mario Delos Reyes of the University of the Philippines School of Urban and Regional Planning, the laws and guidelines for using the maps to make decisions about where people should and should not be allowed to live, are there, but need to be implemented more rigorously at the local level through local ordinances. As mentioned, ‘a subdivision or community located beside a river would need to be relocated in accordance with ordinances to keep it safe from flooding. But any mayor attempting such would run headlong into a wall of protests and claims of human rights violations, or intense lobbying from wealthy landowners and their politicians’ (Llaneta 2012). The issue of relocation carries a high political risk as it can generate protests. In most cases it certainly creates an antagonistic constituency which may prove costly to a politician. It would also mean a reduction in the possible voters in an area during election periods. It seems to be so complex that concrete actions are often avoided.

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In addition to scientific information from PAGASA, PHILVOCS and weather websites, some LGUs rely on community knowledge which may not be scientifically tested but has been validated by experience. For example, in Cagayan de Oro the change in the colour of the river passing through the city may indicate heavy rainfall in the upper basins. However, there are not many examples of LGUs taking their own initiatives to collect and use this knowledge, as they continue for the most part to rely on national government agencies' information and data. We found an exception in Barangay Matina Pangi near Davao City (See Figure 8). With help from a volunteer from a local NGO, the barangay established a simple water level measuring system in the form of a long bamboo stick anchored to a large concrete block to measure the speed of the rise in the river water level, and therefore have an early warning system of the possibility of flash floods.

Our interviewees cited lack of funds and capacity as possible reasons for the limited use of community knowledge. Community knowledge is available, as in the case of the communities in Tabaco City, living within the danger zone of Volcano Mayon. While there is potential for community knowledge to become inputs to policy, it does not happen due to the perception that these forms of knowledge are not scientific enough. The outcome is that policy-making at the local level, rather than an adaptation of national guidelines and policies to local context and knowledge, results in the adoption of the national laws. Faced with funding and capacity limitations, the opportunity created by the law authorizing LGUs to have their own initiatives, taking into consideration their own contexts, is rarely used.

### **3.2.1 A missing link between scientific analyses and assessments and the policy process?**

Linking science to policy requires a conscious effort, both from the supply side (researchers) and the demand side (policy-makers), to use results of scientific analyses and assessments in the formulation of policy interventions. The RA 10121 provides legislative support and mandates so that the national agenda for research and technology development can be used to inform the translated into disaster risk reduction policies. However, it is not clear how scientific knowledge has been used in the formulation of RA 10121 or in the crafting of its implementing rules and regulations, although considering that the law lays the institutional framework, the use of research evidence may not have been a key requirement.

In the context of decision-making at sub-national level, data from the focus group discussions and key informant interviews reveal that the higher the position in the (public) bureaucracy, the more credible an actor is. Consultants, although they are usually external to the bureaucracy, are also perceived as credible.

The role of consultants is interesting. In Davao we met a municipal councillor working with a colleague on a new ordinance to be presented to the municipal council: *Ordinance Strengthening the Davao City Disaster Risk Reduction and Management System, Creating an Office, Appropriating Funds and For Other Purposes*. The idea behind the ordinance is to address the root causes of vulnerability to disasters, strengthen the city's institutional capacity for disaster risk reduction and management, and build the resilience of barangays to disasters, including climate change impacts.

We asked if the councillor was working with researchers on this ordinance, and the answer was yes, however, it turned out that by 'researchers' she meant a small group of lawyers in charge of ensuring that the proposed legislation complied with the requirements and principles set by the Constitution. The councillor had contacted a professor on environmental planning who is an advocate of legislative change in this area, and who is working at the University of the Philippines in Los Banos. The councillor gathered direct knowledge through field visits in her constituency in the hills north of Davao City, and by contacting the research officer at the Region XI office to DENR. The councillor did not rely simply on her own expertise, but had access to a circle of experts to whom she referred on environmental and climate change issues. Her chief of staff also had links to these experts and the councillor's office had a small budget that could be used every year for contracting

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small studies and expert opinions. The budget is insufficient to procure and fund new research by, for example, a university institute.

The interview with the councillor in Davao suggests that the use of knowledge and research evidence to inform the development of new legislation may be done on an ad hoc basis, determined by the existence of networks and individual initiatives in accessing knowledge. Unfortunately we do not have sufficient evidence about the existence of similar processes in the other case study areas. What we noted is that no public office is concerned with the management of DRRM data. National agencies that are dealing with disasters and risks, except those that are tasked with providing scientific information such as PAGASA, PHILVOCS and the Mines and Geosciences Bureau (MGB) of the DENR, are more focused on institutional arrangements and how to deal with disasters, rather than on institutionalising the use of scientifically warranted information.

The absence of institutionalisation does not mean that there are not changes in attitude and perceptions at sub-national level. The interviews in Davao City show that The Comprehensive Development Planning Office prepares the comprehensive development plan of the city and is mandated to oversee and approve the barangay development plans. The office therefore provides technical assistance to the barangay, and there is now a growing awareness that these plans should include disaster risk reduction. The municipality organised a barangay administration and planning orientation in which all agencies meet with the barangay officials, including the disaster risk reduction management council (DRRMC), to discuss how to include disaster risk reduction in the barangay plan and establish a barangay-level DRRMC.<sup>18</sup>

Interviews with the City Planning and Development Office in Davao confirm that the municipality is not able to ‘conduct research like academic institutions do, however the office is responsible for gathering primary and secondary information using participatory resource appraisal, focus group discussion, census and the community-based monitoring and information system’ (informant). The City Planning Office has limited personnel to collect and gather primary data. Data gathering is therefore coordinated with the barangays, which are in charge of setting up their participatory research teams composed of a *purok* leader, barangay health workers and barangay officials. These are trained by the City Planning Office on basic data gathering and tabulation. Our respondents mentioned that not all the barangay are cooperative on these initiatives, and these cases, the City Planning Office will delay approval of the barangay development plan.

The case of Davao shows that links exist between the municipality and academic institutions and are being established between the municipal agencies (e.g. City Planning Office) and academic researchers. The Davao Association of Colleges and Universities, which is spearheaded by the University of Mindanao, was established to enhance the academe-government partnership for sustainable development in the city. They conduct, in collaboration with and on behalf of, the municipal authorities, barangay profiling, barangay development index, project evaluation and database development.<sup>19</sup>

The example mentioned in this section shows that there are initiatives that aim to establish a link between various types of knowledge and policy-making. This also applies to scientific knowledge, so we cannot speak of a ‘missing link’. The overall legislative framework, established through RA 10121, directly impacts the creation of these links. The issues seem to be on implementation, that is, the translation of research evidence into policy activities at sub-national level. It seems to be based on ad hoc initiatives, not fully institutionalised, as in the case of Davao City. Sharing positive experiences does not seem to be used as a way to expand on positive experiences and experiments.

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<sup>18</sup> During the interviews we were informed that not all 182 barangays of the municipality of Davao had established their barangay DRRMC, as this is a council which has just been introduced by the new legislation, i.e. RA 10121.

<sup>19</sup> The City Planning and Development Office in Davao is conducting a compendium of researches or theses of the members of the Davao Association of Colleges and Universities.

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### **3.2.2 Incentives and disincentives for using knowledge/information for designing and implementing urban resilience interventions**

We saw earlier that the theory about evidence-based policy-making processes suggests the use of scientific knowledge is beneficial for the policy process, and complements other types of knowledge that can also be used to make informed policy decisions (see Jones et al., 2012). For example, the use of landscape as the basis for disaster risk reduction management, instead of political units, will lead to a more authentic institutional mechanism and response.

LGUs relying on more accurate information will lead to better planning and preparation and a more judicious use of resources. Geo-hazard maps, for example, help determine risk areas, and therefore enable the appropriate use of the 5% calamity fund for investment that aims to strengthen response to natural disasters. There is therefore an incentive to access and use scientific information as it can justify the procurement of equipment for preparedness and mitigation. It provides credibility or legitimacy to these requests.

There are factors that may impede the use of information and research. The term of office of local government officials is only three years, which may not be enough to develop strong resilience policies and initiatives that are informed by scientific information. Furthermore, it is costly at the local level to develop policies using scientific evidence, considering budget is required to conduct baseline research, design and implement pilots, reflect on what works and what does not work, and then expand the resilience initiative.

Another disincentive for using scientific data lies in the political risk associated with the use of evidence. The hazard risk we were shown in Davao City clearly indicated the areas of the city that are prone to floods and which have, in the past, suffered high numbers of casualties due to floods. The maps show that these areas are densely populated. But why are people allowed to live there? The answer lies in the economic and political costs associated with relocation.

In Davao City, we asked if the regulation of not having houses built within 3-meters of the river bank is being implemented. The answer was that the municipality is struggling with this due to the limited resources available for monitoring the regulation. Moreover, the number of informal settlers in risk areas has been estimated at around 18,000 families, and relocation would be expensive, as moving families involves legal proceedings and assistance, as well as the identification of a suitable new and safe site.

Political risks are also high, as forced relocation would inevitably spur protests and even riots. Therefore, what may be technically sound (i.e. relocation) may not be politically feasible. Scientific evidence, even if legitimate, is therefore not used if the political risk is high.

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# 4 Conclusions

The objective of the study was to better understand the factors that favour or hinder the use of scientific knowledge and research evidence in the design and implementation of urban resilience measures in seven urban areas in the Philippines. We focused on natural disasters which are specific to climate change such as typhoons and floods, and geo-hazards such as earthquakes. The study was conducted by adopting a political economy approach.

The main conclusion of our study is that RA 10121 has established, among other things, a legislative framework that enables greater use of scientific evidence in designing disaster risk reduction policies and interventions, both at national and sub-national level.

In terms of urban resilience, which is the focus of our study, the main change introduced by RA 10121 compared to its predecessor, the Presidential Decree 1566, is that disaster risk prevention (in addition to response) is highlighted as a key government priority at the national and local level. This all contributes to building greater resilience to natural disasters.

RA 10121 was introduced in 2010. The implementation is ongoing and progress has been made to establish local DRRM offices, although not all LGUs have established one yet. These are therefore early days to assess the impact that RA 10121 has had on local level activities, as well as attitudes and perceptions of policy-makers and elected representatives at the sub-national level.

The results of our study show that the demand for use of scientific knowledge by policy-makers is linked to the occurrence of a natural disaster, rather than the risk of a natural disaster. We found one exception, in the case of a provincial governor who managed to build political capital by making disaster prevention a key element of his election campaign in the province of Albay, which is at high risk of natural disasters. Under his leadership, new links were established between the local administration and an academic institution that led to greater sharing and exchange to achieve greater evidence-based decision-making on disaster risk reduction.

While important, local leadership may not lead to sustainable urban resilience. A new election could easily result in new leaders from different parties being elected who can overturn decisions made by the previous administration.

To achieve greater stability in the design of policy and programs that strengthen urban resilience, initiatives that try to link research and policy-making should be initiated by institutions that are not bound by electoral politics. Hence, the starting point should be universities and research institutions, as non-partisan catalysts of change.

We found that the demand for scientific evidence to inform disaster risk reduction policies and programs is not (yet) strong. However, we found some promising examples of engagement by academic institutions with the policy-making process. The three cases mentioned in our study, Xavier University in Cagayan de Oro, the Climate Change

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Academy at Bicol University in the province of Albay and the Davao Association of Colleges and Universities, are early examples of possibilities for developing greater engagement with evidence-based decision-making processes on disaster risk reduction.

Our analysis shows that community knowledge is valued and being used to develop early warning systems. It complements the data which are regularly collected by LGU offices and units. The examples we found are the result of independent initiatives and leadership, mainly at the barangay level. While this reflects the nature of decentralised public administration and decision-making in the Philippines, we also found that LGUs have limited capacity and infrastructure to collect, store and analyse different types of knowledge, information and data: community knowledge and data, line agencies' data, scientific knowledge and research. This could be one of the responsibilities of the DRRMO and would help build trends of natural events from the barangay up to the LGU, which could then be used to plan and implement policies and programs.

Overall, we found that when there is demand for scientific evidence from locally elected officials it takes the form of a request for advice directed to experts and academics. This is mainly done through personal networks and contacts rather than the procurement of studies and research. The main limitations for increasing the demand for research evidence are: (1) limited budgets available at LGUs, and lack of elected representatives to procure new research, (2) the three year-term between elections, which seems too short to implement major pieces of research, (3) the capacity to demand and interpret scientific evidence, and (4) a limited understanding among staff of LGUs and line agencies of the measures and directives included in RA 10121, although this is being addressed by training programs managed at the national level.

Where there was a supply of research evidence on disaster risk reduction, we found that it was generally done by academic institutions. Other than advocacy NGOs, we found no evidence of independent research institutes in the areas visited for the study. Overall, the role that local academic institutions play in influencing policy-making or monitoring of policy implementation is still limited. One constraint is the system of career progression that, in academic institutions, favours the publication of academic research in international peer review journals. Policy research and studies are less relevant for one's career. While there are, as discussed earlier, promising exceptions, this could be one explanation for the limited engagement of local universities in policy-making processes on disaster risk reduction and urban resilience, in the case study areas that we visited.

When research is actually presented to policy-makers, there is a risk that it uses language which is too technical, and targets only the few law makers who happen to have a technical background. Therefore, it is important for research institutions to translate and package scientific information into forms that are accessible to policy-makers and the general public to strengthen demand and interest around the results of the research. One way to achieve this is for academic institutions to establish collaborative partnerships with, for example, advocacy NGOs on natural disaster-related topics and urban resilience. We did not find any examples of this.

While research evidence contributes to better-informed decisions, we should be aware that knowledge is not politically neutral. Research evidence can provide technically sound solutions to social problems, but these may not always be politically possible solutions (Faustino and Fabella 2011). Relocation of families who have settled in risk-prone urban areas is a clear example of this. The technical solution, that is, relocation due to the danger that a natural disaster could hit the area, is politically not feasible, due to the political and economic costs involved in enforcing it. This is the case in Davao, where 18,000 families live in hazardous areas.

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In these situations, what is politically feasible is to direct part of the funds available for relocation into investments in adaptation and defence against natural disasters. While the risk can never be brought down to zero, they may be feasible solutions.

While finalising this report in August 2012, BBC News Asia reported heavy rains were causing floods in Manila. So far, 850,000 people have been affected in the metro Manila area, and at least 16 people have been killed. More than 80,000 people are in emergency shelters as torrential rain has left low-lying areas of Manila under water. Just a week ago, more than 50 people died after Typhoon Saola struck in the north of the country. However, among the grim news, a report by Kate McGeown<sup>20</sup> of BBC News mentioned that, this time, there has been a feeling among the affected population in Manila that the Government's evacuation procedures are better organised. This is probably helped by modern technology, as people stranded on roof tops have been texting for help, and the Twitter hashtag #rescueph has quickly been adopted by those who are stuck, and others trying to find them. A sign perhaps that communities and local administrations are becoming more ready and resilient.

**Figure 10: Flood in Manila August 2012**



*Photo: BBC News Asia*

Natural disasters do not wait for policies. They will continue to strike and we can assume that their frequency and intensity may increase as a result of climate change. Strengthening resilience to these natural disasters must be done by investing in urban programs and infrastructures that will reduce or limit their impact. Whenever possible, alternative options should be provided for people who live in disaster-prone urban areas, and early emergency response and education systems should be in place. Research can contribute to these processes by providing evidence that can be used by policy-makers and communities to identify technically sound and politically feasible solutions.

New legislation and the commitment of President Aquino's administration are proving a unique opportunity to increase the use of research evidence and scientific knowledge in disaster risk reduction policy decision-making, both at national and local level. This can contribute to strengthening resilience to natural disasters and this opportunity should not be missed.

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<sup>20</sup> Kate McGeown BBC News, Manila <http://bbc.in/OVplnH>

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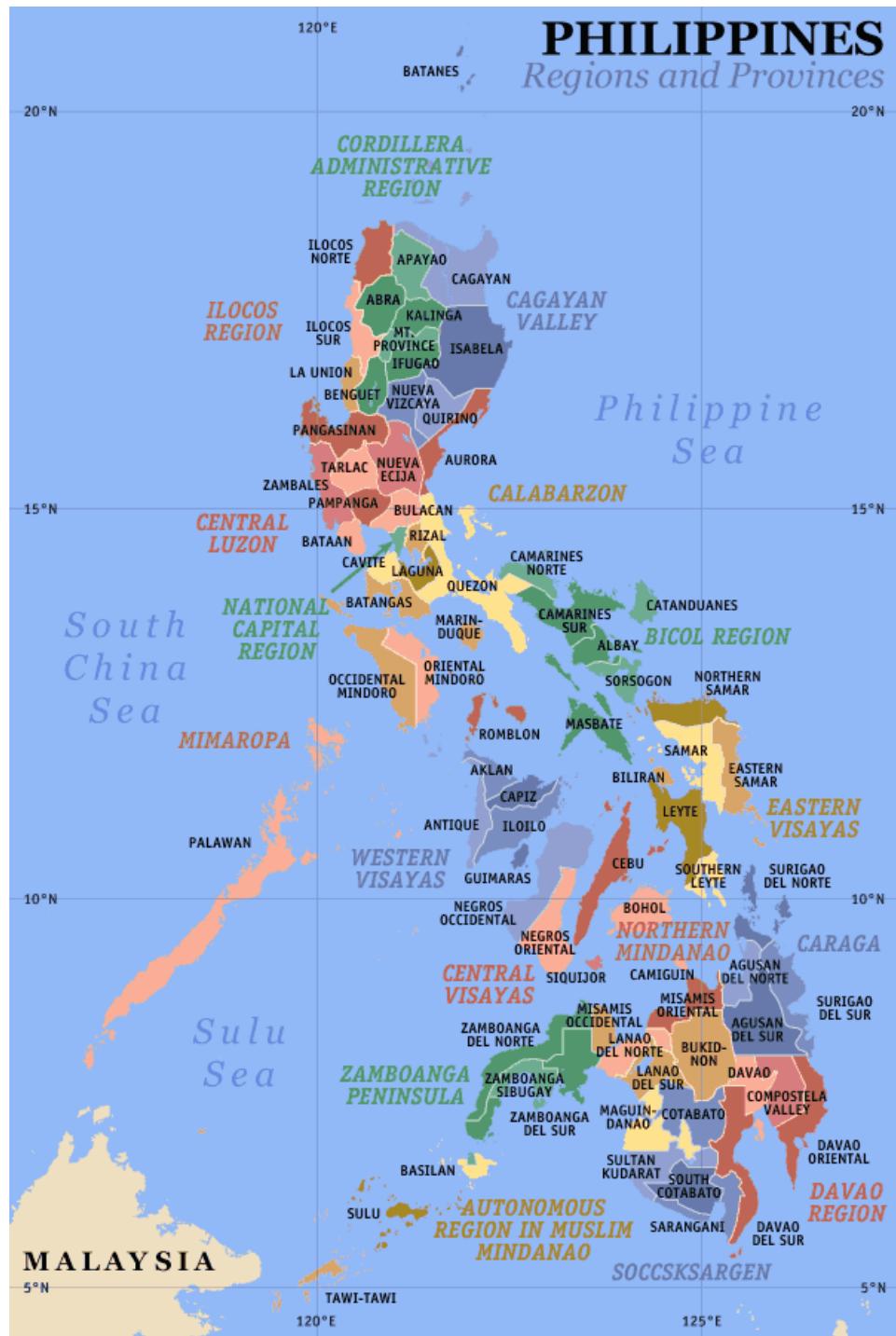
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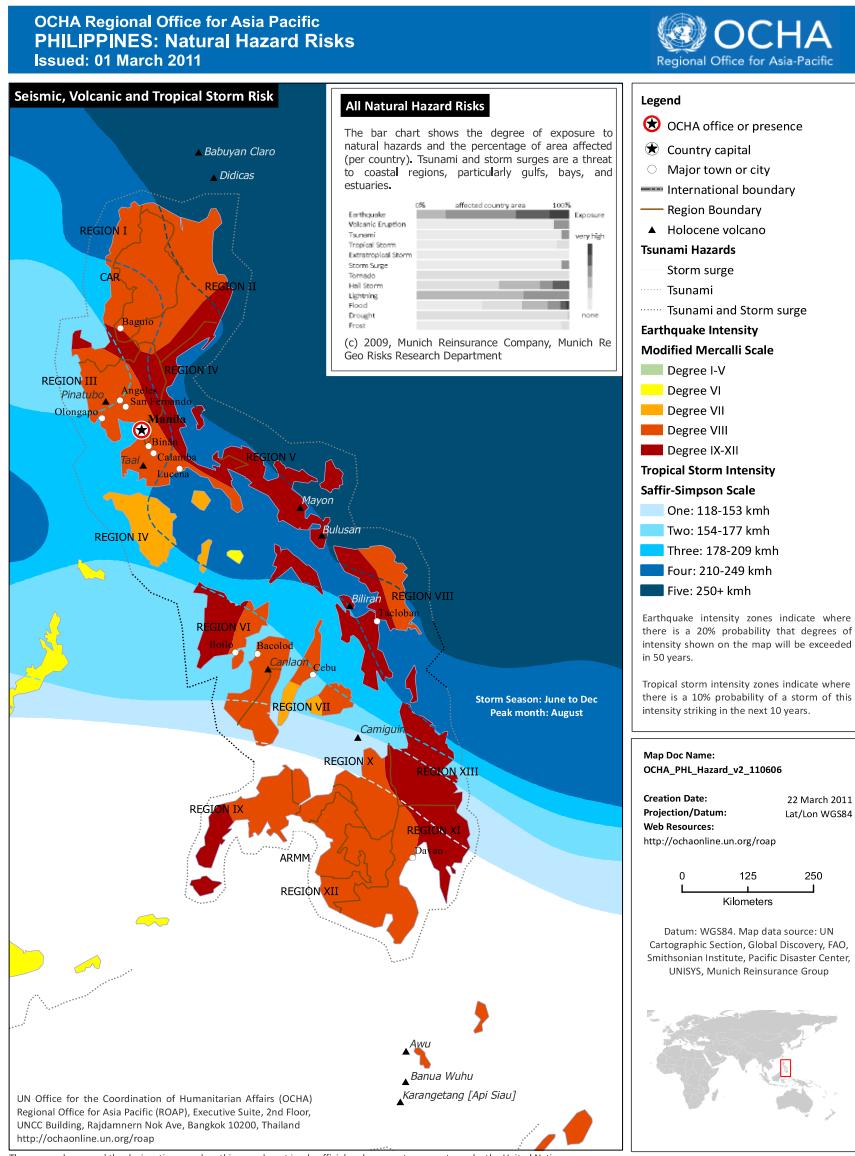
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**Figure A1: Map of the regions and provinces of the Philippines**



## Figure A2: Composite hazard map of the Philippines

This map illustrates the Philippines's exposure to seismic, volcanic and tropical storm hazards. Earthquake intensity zones indicate where there is a 20% probability that degrees of intensity shown on the map will be exceeded in 50 years; tropical storm intensity zones indicate where there is a 10% probability of a storm of this intensity striking in the next 10 years.



Source: United Nations Office for the Coordination of Humanitarian Affairs Regional Office for Asia and the Pacific (OCHA-ROAP) 2011, available at <http://bit.ly/Owa8N3>



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ISSN: 2052-7209

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Cover image: Vulcano Mayon in Albay,  
Arnaldo Pellini.

ISBN: 978-1-909464-42-1

