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HDN DISCUSSION PAPER SERIES

PHDR ISSUE 2012/2013 NO. 13

HDN Discussion Papers are commissioned by HDN for the purpose of producing the Philippine Human Development Reports. This research is funded by the United Nations Development Programme (UNDP). Papers under the Discussion Paper Series are unedited and unreviewed.

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1. Introduction

In September 26, 2009, Typhoon Ondoy (international code name Ketsana) unleashed a record amount of rainfall in Metro Manila and other areas. Together with Typhoon Pepeng, which occurred a week after and which also brought about widespread flooding in Central and Northern Luzon, the official death toll reached almost a thousand and affected almost a quarter of the population living in the affected areas. Total monetary damages reached around P 68.2 billion, while other associated production and economic flow damages reached P 137.2 billion (Government of the Philippines, 2010).

One of the reasons that have been advanced for the devastating effects of the 2009 typhoons in Metro Manila had been changing land patterns in areas within and around the metropolis. It has been recognized that the loss of forestlands within the Marikina and Montalban watershed areas, for example, had led to the loss of up to 50 percent of watershed topsoil which had flowed into riverbeds resulting in the decline of the 'loading capacity' of rivers to absorb flood waters (Zolate-Nantes, 2001). Despite several executive and administrative issuances to limit development in the Marikina watershed and the presence of a multi-stakeholder structure that is supposed to monitor the area, these do not have seemed to have reversed the continued loss of natural resources in the area.

The objectives of this case study are to discuss the different institutions within and around the watershed area and their limits that have spurred the creation of the Marikina Watershed Environs Integrated Resource Development Alliance (or the Alliance of 7), a network of seven local government units in Metro Manila and the Rizal province, and the different roles it has undertaken, including protecting and safeguarding the watershed. We examine the limits and possibilities, given that the geographical reference of this case study is the Marikina watershed, of these institutions and the possibilities for more effective disaster response and climate change adaptation brought about by the creation of the Alliance of 7.

This case study utilized key informant interviews among technical working group members of the Alliance of 7, and its non-government organization secretariat, the Resilience NGO coalition, staff of the Department of Environment and Natural Resources and other citizen groups involved in watershed protection, and government agencies responsible for disaster prevention and land use planning. Key source documents related to the work of the Alliance of 7, regulation of the Marikina watershed, planning documents related to land use, disaster planning and mitigation, and watershed protection, were also utilized.

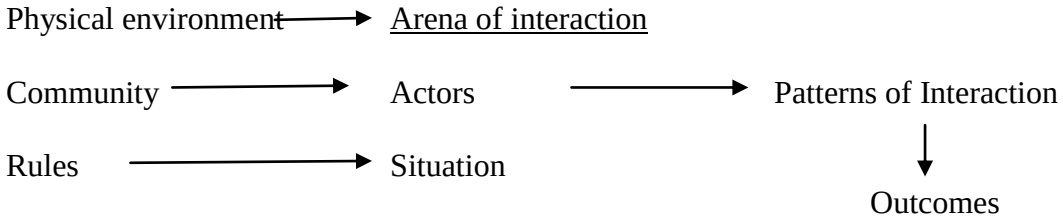
II. Framework

Decentralized approach to common pool issues. Ostrom (1999), in analyzing case studies in the governance of so-called "common pool resources" (or CPRs, defined as the natural or human made resources where one person's use subtracts from the other's use, and where it is important, but costly and difficult, to exclude others from using the good, i.e., rivalrous but non-excludable goods) noted that national governments are often unsuccessful in designing uniform set of rules that regulate these resources across a broad domain. This is due to the fact that governments typically lack the financial and human resources to monitor effectively the rules that they had set or because of multiple conflicting objectives on the use of the resource. On the contrary, in many other circumstances, local groups have created a wide set of institutional mechanisms in order to manage CPRs by themselves, or with the assistance of external actors.

The advantages of the decentralized approach are the following: local individuals and groups have better information on the operation of the physical-biological system and are more adept in dealing with other local actors; rules can be developed by these local groups that increase mutual exchange with others and thus may reduce the need for more costly monitoring and enforcement mechanisms; several groups may be undertaking innovative approaches in a specific area simultaneously and thus this reduces the probability of failure for the entire region. While there are disadvantages in undertaking this approach (i.e., risk that there will be no self-initiative to organize, or these organizing efforts would fail), Ostrom noted that there are many examples of how 'self-organized governance' systems have succeeded in improving the management of natural resources and increasing livelihood possibilities in the area.

In analyzing the effects of institutions on development outcomes, the institutional analysis and development framework developed by Ostrom and others could be particularly useful to make comparisons and evaluations. Koontz (2003) noted that development outcomes in the framework is affected by the following factors: a) the attributes of the physical environment; b) characteristics of the actors in the geographical area; c) rules and incentives that allows and constraints particular actions; and d) interactions of actors within the area.

This case study will utilize a simple variation of the institutional analysis and development framework popularized by Ostrom and others. Koontz (2003) illustrates the framework as follows:



According to Koontz, the most important area of analysis is the arena of analysis where participants in a social situation decide on the different actions in the light of information that they possess on how their own actions are linked to potential outcomes, including the cost and benefits that are linked to their actions and outcomes. The arena of interaction is affected by the

rules ('statements about what actions are required, prohibited or permitted, and the sanctions and rewards if these rules are followed or not'); these rules are created by human beings which are devised to solve problems in their own community. Interactions are also affected by the physical environment, including factors such as weather, terrain, climate and the diversity of species in the area. The last factor that affects interactions is the characteristics of the community which affect individual actions, including 'generally accepted norms of behaviour, common understanding of interactions and the distribution of resources among members.'

In addition, Koontz noted that the framework accommodates Ostrom's "design principles" of rules for common pool resources which accounts for the success of institutions in sustaining CPRs. These include: clearly defined boundaries among actors, the rules are congruent with the conditions at the local level, affected individuals are able to participate in modifying the rules, monitoring mechanisms are present and are accountable to those that appropriate the CPRs, there are sanctions that are applied to the violators of rules, conflict mediation mechanisms are present to resolve issues among participants and 'appropriators', and there is a recognition by the government of the right to organize the CPRs.

Inter-local government coordination approaches. One of the ways in which more decentralized approaches to governance can be undertaken is through inter-local government approaches. In the past two decades, following the decentralization and devolution of governmental functions increasingly popular in developing countries, local government units have increasingly banded together in order to more efficiently provide basic services to their constituents. The rationale for such an arrangement comes from the fact that there are benefits that can be derived in terms of scale economies and external spillovers from providing services across political jurisdictions. Controlling for negative externalities imposed on another local government unit, such as crime and differing land uses, can produce gains for jurisdictions that cooperate with one another. In fact, inter-local government arrangements may be spurred on by the interest of political leaders to widen their electoral constituencies (Feiock, 2005).

But at the same time, there are costs in sustaining such inter-local government arrangements; these include the following: information (gathering information on preferences across different constituencies), agency (accuracy of the negotiators of the preferences of their constituencies), bargaining/ negotiation (resource costs associated with undertaking an agreement) and enforcement (costs in implementing the agreement).

In the Philippines, inter-local government agreements have been recognized by the Philippine Constitution (Article X, section 13) and the 1991 Local Government Code (Chapter 3, section 33). In the latter, the requirements for undertaking such agreements, especially if funds, real estate, equipment and other types of property are involved, are the approval of the local sanggunian and the presence of 'Memoranda of Agreement' between local government units. While there are fears that such arrangements may result in the annexation of the smaller local government unit by the larger unit, there are others that view these as an improved form of decentralization (Mercado and Mansan, 1998).

There have been many experiences in inter-local government cooperation in the country. For several years, the Department of Interior and Local Governments have been undertaking a

program called 'One Cluster, One Vision for Local Development'. The program, which used to be known as 'Area Management Approach to Local Governance' and the 'LGU Cluster Approach', started in 1992 and by 2008, there were a total of 38 LGU clusters involving 168 municipalities nationwide. However, these clusters are based within a single province and involve mainly agriculture or fisheries/ coastal resource management. The Department of Health has been organizing inter-local health zones in order to improve enhancement of sharing of health personnel and other resources in the provision of primary care to populations. On the other hand, there have been local 'economic alliances' in Pangasinan, Zamboanga del Norte, Guimaras and Bohol supported by donors such as the Local Government Support Program- Local Economic Development (funded by the Canadian International Development Agency) that have focused on agriculture-based and eco-tourism projects.

III. **The Marikina Watershed Reservation**

Watershed area. The Marikina Watershed is a natural geographical feature that can provide a potential contribution to human development outcomes of the population within the reach of its effects to the environment. According to Contreras (2004), in terms of its hydrological aspect, watersheds, also termed as 'catchment' areas, refers to areas that provide water by surface or subsurface flow to a natural drainage system, i.e., lake, river or stream. However, watersheds can also be described in terms of their 'physical-biological' units given the existence of forestlands, farmlands and other types of land areas, where different types of flora and fauna can be found in these areas. It has also been described as socioeconomic and sociopolitical units for planning and implementing resource management activities, and for undertaking activities that generate economic activity. It is as both a supply/ source and distribution system of water resources that can be provided and made available to various users.

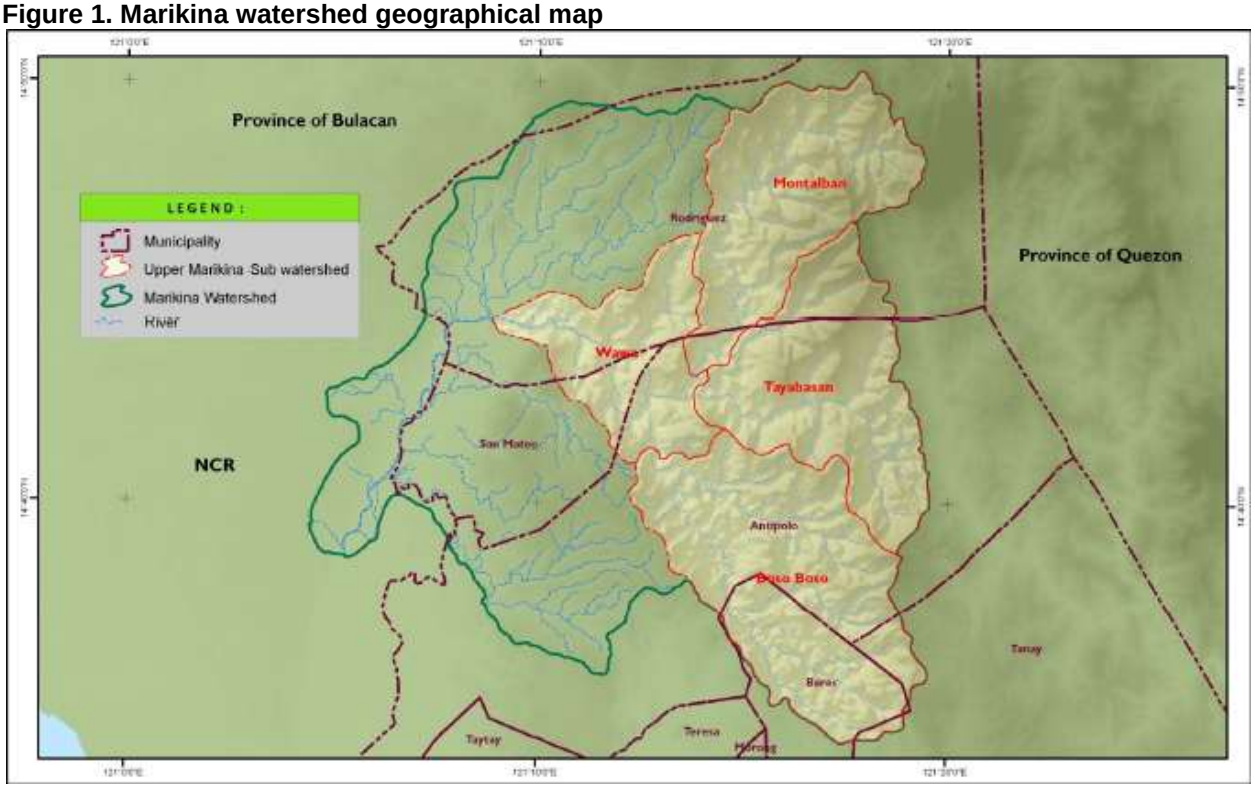
The Marikina Watershed is a forest reservation and is one of the main sources of water of Metro Manila; it is one of the last remaining forest areas near Metro Manila. It covers around 28,174 hectares[1] reaching the cities and municipalities of Antipolo, Tanay, San Mateo, Baras and Rodriguez (formerly Montalban) in Rizal province. (Table 1 below shows the geographical coverage of the watershed, including the municipalities and barangays that cover it; Table 2 shows the geographical map of the coverage). It is one of the areas protected under the National Integrated Protected Areas System (NIPAS) Act of 1992, and is currently managed by a protected areas management board, under the Department of Environment and Natural Resources.

Table 1. Geographical coverage of the Marikina watershed

Municipality	**Barangay**
Antipolo	Calawis, San Jose, San Juan, Inarawan
Baras	Pinugay,
Rodriguez	Puray, Mascap, San Rafael, San Isidro
San Mateo	Pintong Bocawe
Tanay	

[1] The 28,174 hectare figure is the official figure given by the Department of Environment and Natural Resources. Removing coverage of other lands 'legitimately excluded', Nicer (2004) estimated the total coverage of the watershed at 26,646 hectares. However, there are other unofficial estimates that the total land area of the watershed would be in the range of 26,000 to 29,000 hectares.

Figure 1. Marikina watershed geographical map



Source: AECOM (2011).

Legal bases. The Marikina Watershed Reservation was established as the City of Manila's water source by Executive Order 33 in 1904 signed by then Governor General Luke Wainwright (Nicer, 2004). The latter defined the reservation's boundaries in accordance with the natural physical boundaries of the watershed where it was situated. A survey was undertaken in 1909 which placed the total land area of the watershed to cover around 28,000 hectares. Revisions made by Governor General Francis Harrison in 1919 and by Governor General Frank Murphy in 1935, who deposed certain parts of the reservation to private individuals, limited the land area covered by the watershed.

From 1973 to 1977, using martial law edicts, President Ferdinand Marcos issued several presidential decrees allowed the disposition of lands to private entities for agro-industrial use, and for residential purposes (i.e., the establishment of the Boso-Boso Townsite Reservation, which was later renamed as the Lungsod Silangan Township). In January, 1986, President Marcos under an executive proclamation excluded major parts of the watershed area for resettlement purposes.

In 1990, President Corazon Aquino declared certain portions of the reservation under an integrated social forestry program under Proclamation 585. In 1992, the Marikina watershed was recognized as one of the protected areas under the National Integrated Protected Areas System Act (Republic Act 7658). And in 1995 and 1996, President Fidel Ramos issued four edicts that allowed the use of the area for landfill and waste management purposes, for government housing and for resettlement of urban poor. And in 2004, the Macapagal-Arroyo administration issued

Executive Order 33, which banned the resettlement in the area, and the entry, sale and disposition of lands within the Marikina reserve.

A review of the edicts (Nicer, 2004) pointed out that the subsequent issuances after Wainwright's Executive Order 33 seems to be legally indefensible because of several problems: a) the areas covered by the proclamations are outside of the original boundaries; b) more recent laws, such as the National Integrated Protected Areas System Law, and other presidential issuances had disallowed the disposition of watershed land to private entities and other 'inconsistent uses'; and, c) the provision in the Administrative Code that allows the President to reserve public lands whose purposes have not been stated by law.

Issues in the Marikina Watershed. Some of its current problems include the following (Palapac, 1994; Arias, 1999; Nicer, 2004):

a) *Problems of water pollution, siltation and loss of trees and forest cover*: Water quality in the Boso-Boso River in the southwest area of the reservation has reportedly deteriorated because of the presence of commercial agriculture and livestock activities. Commercial activities in the Wawa River in Montalban (now Rodriguez), Rizal, another tributary that is flowing from the Marikina river, had been controversial since long since the 1970s; quarrying and dredging for gravel and sand are extensive in the area. Furthermore, deforestation (specifically, secondary and tertiary cutting of trees and the use of fields under shifting cultivation) has reduced the ability of the watershed to perform its water conserving function. Flores (undated) noted that the loss of forest cover contributed significantly to the destructive effects of Typhoon Ondoy in 2009; it has been estimated that the flood peak discharge reached a total 16,000 cubic meters per second (Abon, David, Pallejera, 2010). Because of the increase in commercial activities in the area, the DENR has issued several departmental orders, more recently in 1999 (Memorandum Order 1999- 08) and in 2004 (Administrative Order 2004- 57) limiting commercial activities in the area.

   The opening of the landfill in San Mateo, Rizal in 1996, in an area located within the Marikina watershed, which served as one of the main dump sites for solid wastes for Metro Manila, also has further contributed to the deterioration of environmental quality in the area. In 2009, the national government approved the opening of additional areas for landfill, but this has been held in abeyance before consultations can be made with local stakeholders.

b) *Problem of Informal Settlers*: Currently, there is an estimated 80,000 people living in the Reservation or around 16,000 families, much greater than the 1,700 families provided with tenurial instruments and thus registered with the DENR. Many of the settlers were allowed to reside in the area under resettlement edicts issued by the government since the 1970s. But others have informally settled in the area; because of expectations that national government will eventually provide them with formal titles, this has encouraged them to stay in the area. Local politicians have encouraged these informal settlers to reside in the community by providing local infrastructure, such as

concreted multipurpose halls and covered sports arenas, which is disallowed in the watershed area. There are also reports that violent clashes have erupted in the reservation in the mid 1990s, with settler associations competing for the rights to occupy certain areas within the reservation (Palacpac, 1994).

c) *Tenurial rights distribution problem:* Related to the issue above, Under the Integrated Social Forestry (ISF) program of the DENR, settlers are encouraged to undertake conservation activities in a protected area and in exchange, government grants settlers security of tenure. Proclamation 585 in 1990 declared 1,430 hectares in the reservation under the program, while DENR administrative order allowed the conveyance of the tenurial rights to migrants in order to encourage greater conservation. However, there are reports that settlers who conveyed their rights were unwilling to leave; other settlers who continued to exercise their land rights subdivided these rights into homelots which were sold to non-settlers.

   Thus the DENR was forced to change the granting of tenurial rights from individual families to organizations to stem reselling of tenurial rights to non-settlers. In the late 1990s, government issues Protected Areas Community Based Resource Management Agreements (PACBRMA) to two organizations- the Upland Farmers Housing Inc in Barangay Clawis, and the Sapinit Watershed Settlers Association- under 25 year terms in which these organizations would protect the watershed without creating vested rights on watershed.

d) *Problem on intrusion of private property claims and development*: There are large privately titled lands located near the watershed area, especially near the Boso-Boso area. The creation of any watershed management plan is complicated by these. Part of the problem has been due to the fact that several Marcos era edicts have reserved areas within the watershed for private agricultural companies. There are also several reports in the past that personnel of the Department of Environment and Natural Resources, which has supervision over the watershed, have been illegally issuing free patents to groups and individuals (Pablito , 1999).

e) *Problem of Kaingin and Reforestation.* The problem of slash-and-burn agriculture (*kaingin*) continues after several decades simply because the trees grow. The DENR and private groups have undertaken reforestation program in an attempt to counter the destructive effects of *kaingin*. Unfortunately, these programs have not been sustainable and thus a significant amount of forest cover has been lost.

Given the importance of the Marikina Watershed as water source and distribution system, and in affecting development outcomes of those living within and near the watershed area, an analysis of institutional issues, specifically on how it is accounted for by national and local government agencies, is important.

One issue is the coordination of development activities within the watershed reservation. Despite the multitude of DENR orders that have tried to limit commercial activities within the watershed area, there are monitoring and enforcement problems encountered by the watershed

board managing the reservation. Church and environmental groups have denounced the continued quarrying and deforestation activities that have been occurring in the area (Pablito, 1999; Alave, 2008). Local government units have also reported to have constructed physical infrastructure without the knowledge of the national government. In other watershed areas, conflicting land uses and practices, poor delineation of land and disposition of watershed areas and the rise of informal settlements have reduced physical resources in these areas; in the Maasin watershed near Iloilo city, the loss of 64 percent of forest area due to commercial activities have resulted in the decline in the ability of the watershed to meet the water needs of the nearby water areas (Rola, Francisco and Laguton, 2004)

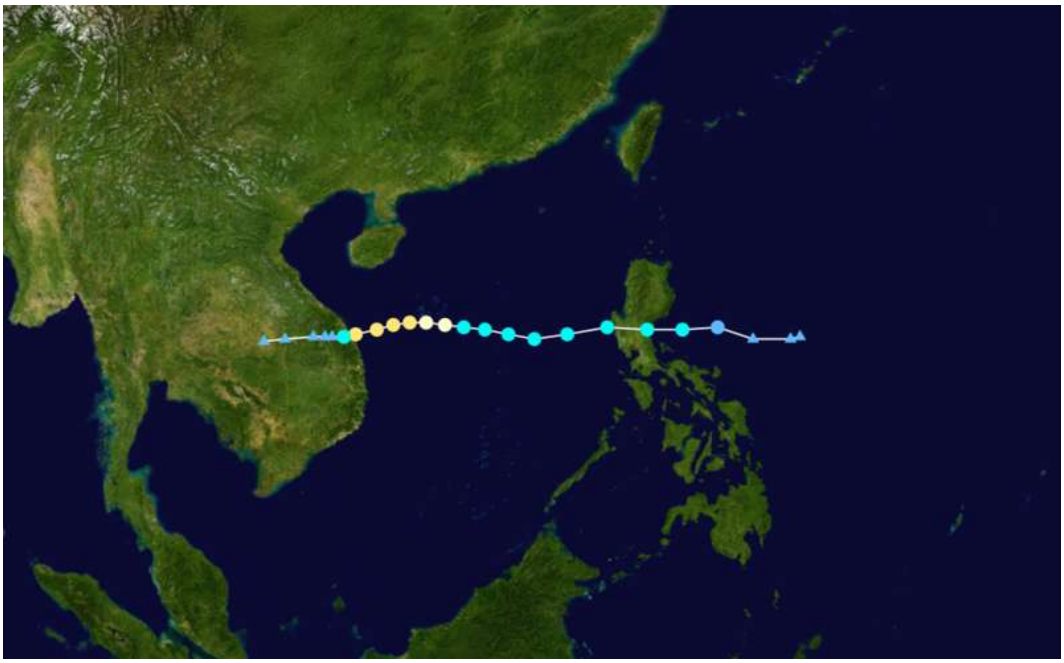
Another area for national and local coordination is in the issuance of free patents and other tenurial instruments for residential development. Last October, 2010, DENR Secretary Ramon Paje has agreed to suspend the issuance of these instruments in order to limit the influx of migrants into the reservation, but he also warned local officials to desist from issuing residence certificates that would allow bearers to claim public property in the reservation.

Another issue is the need for coordination across local government units in terms of residential and commercial development around the watershed area, especially in the light of the importance of disaster preparedness. Due to the effects of typhoons Ondoy and Pepeng, provisions for site development and urban planning are insufficient in a natural flood zone (Environment Science for Social Change, 2010). Planners have noted the need for integrating natural water flows in residential planning; local government planners and housing developers might well examine the historical reality of the land and water of the Marikina Valley and its river which makes up a significant part of the catchment areas. This need for inter-local coordination in terms of planning has been recognized as one of the major issues in terms of urban development (Housing and Urban Development Coordinating Council and the Philippine Institute for Development Studies, 2009).

There are other issues in terms of institutional coordination and planning that have to be examined. For example, typhoons Ondoy and Pepeng also brought into fore the importance of coordination in terms of developing common early warning systems and protection of the ecological systems to reduce the impacts of natural hazards.

Ondoy and Flooding in Metro Manila. Tropical storm Ondoy (International codename Ketsana) was first spotted in the Philippine Sea on 24 September 2009. By 11:00 pm local time (1500 UTC), its center was located 611 km east of Manila moving west-northwest at 16 km/h (Gutro, 2009). Following its forecasted track, Ondoy made landfall on 26 September shortly before 12:00 noon local time (0400 UTC), near the border of Aurora and Quezon provinces, packed with maximum winds of 85km/h near the center and gustiness up to 100 km/h (Ubalde, 2009). The slow-moving storm crossed Central Luzon before exiting the western seaboard towards the South China Sea. Ondoy was located 230 km west-northwest of Iba, Zambales by the morning of 27 September 2009 en route to Vietnam.

Figure 2. Track of Typhoon "Ondoy" from September 25-30, 2009



Source: Wikipedia (2011). "Typhoon Ketsana," Wikipedia, Retrieved August 11, http://en.wikipedia.org/wiki/Typhoon_Ketsana.

The total precipitation from 25-26 September 2009 are 173.5 mm (6.8 inches) over Manila (Port Area Gauge Station) and 530.6 mm (20.9 inches) over Quezon City (Science Garden Gauge Station). Rainfall intensity was highest between 11:00 am-12:00 pm of 26 September with a precipitation rate of 92 mm/hr. The tropical rainfall mapping mission satellite (TRMM) measurement of accumulated rainfall in Luzon from September 21 to 28, 2009, are on the order of 375 mm (15 inches) to over 475 mm (19 inches) with the highest record near Manila amounting to 585.5 mm (24 inches). The enhanced rainfall over the Manila side of the island as the storm approached is attributed to the interaction of Ondoy's (Ketsana's) circulation and the seasonal southwest monsoon (Gutro, 2009).

Table 2. Rainfall during Typhoon Ondoy in Quezon City, Manila and Tanay

Measurement station	**Precipitation**		**Date**
	(mm)	**(in)**	
PAGASA Science Garden,Quezon City, NCR	**454.9 mm**	17.91 inches	September 26, 2009
Tanay,Rizal,CALABARZON	**331.7 mm**	13.06 inches	September 26, 2009
Manila,Metro Manila,NCR	**258.6 mm**	10.18 inches	September 26, 2009

Source: Wikipedia (2011). "Typhoon Ketsana," Wikipedia, Retrieved August 11, http://en.wikipedia.org/wiki/Typhoon_Ketsana.

The soil can absorb between 100–150 mm with 200 mm at maximum, so more than 180 mm of rain means heavy flooding. An estimated 50-80% of the rainfall was within only 6 hours span, and 65-95% within 9–12 hours span was recorded. The soil can also absorb between 40–60 mm in 6 hours without flooding, and Ondoy's rainfall turned out to be of a flash flood type and was

very unanticipated and unprepared for, which led to many deaths and extensive destruction of property.

In the 12 hours of continuous rainfall on September 25-26, flood waters rose from waist level to about two storeys high in many different areas in Luzon, especially within Metro Manila. Entire streets in the cities/municipalities of Antipolo, Cainta, Quezon, Makati, Malabon, Manila, Marikina, Montalban, Paranaque, Pasay, Pasig, Pateros, San Juan, San Mateo, Taguig and Valenzuela were submerged. Hardest hit by the killer floods were Marikina and Pasig, cities built within a fault-bounded valley east of Manila.

In all, about 800 people died, 400,000 people were displaced, and PhP17 billion worth of infrastructure and agriculture were damaged. Marikina City, Cainta, Pasig City, and the towns ringing Laguna Lake were devastated, some remaining so for three months. Most of Marikina City was submerged in 10 feet of water and tons of knee-deep mud and sludge. Provident Village got the worst of it being on the river meander (ESSC, 2010).

Typhoon "Ondoy" severely struck Metro Manila and it left an indelible mark on the administrative capacity of LGUs who were mostly on its own on the first day to respond to immediate rescue and recovery operations. It was a monumental challenge especially among the LGUs like Cainta, Rodriguez, and San Mateo and even among cities such as Marikina, Pasig, and Quezon City. The burden of immediate rescue, relief, and recovery operations was eased afterwards when the national government's office of civil defense mobilized the army, police, navy and special units by assigning designated areas and established temporary command centers inside the affected areas for fast action and coordination.

It was the worst of times after the natural elements of bad weather conspired with the unplanned human settlements and structures from the Marikina watershed down to the flood drains of Marikina River. It was after Typhoon Ondoy that people and governing institutions regain back the interest of managing the Marikina watershed as common resource.

Effects on poor communities. Informal sector workers and their families, especially those living in the Pasig-Cainta floodway, were the social sectors most affected by the natural disasters; these included small traders and producers and service providers (Government of the Philippines, 2010). Some of the specific effects of the typhoon and its aftermaths on the poor are the following (Institute for Philippine Culture, 2010; Ballesteros, 2010; Porio, 2010):

a) Adverse impacts on livelihood and employment. Entrepreneurial activities, from which the poor derive their main sources of income, suffered negatively due to typhoons; many transport workers, including jeepney, tricycle and pedicab drivers, were not able to work due to roads that were made impassable by floodwaters. Many small and micro establishments, including sari-sari stores and carinderias/ food stores, stopped operations as these were flooded and because there was a lack of demand for their products. According to a post-disaster survey, around Php 4 billion was the estimate in terms of damage and losses for small enterprises engaged in commerce. This resulted in a significant drop in the income of marginalized groups, which rely

petty trading for their living; there have been reports that the poor lost as much as 80 percent of their impact immediately after the typhoon.

b) Lay-offs and increased employment costs. In Marikina, operations in several shoemaking and garments firms in Marikina stopped permanently or temporarily due to the floods and thus resulting in lay-offs. Workers in the flooded areas saw their transportation costs increase by up to three times, i.e., from 20 pesos to 50 pesos per day in Pasig (Porio, 2011). A few workers also were emotionally affected by the typhoon resulting in increased absenteeism from work; some had family members affected by the event that they had to take leaves to take care of their emotionally-scared relatives.

c) Shifts in livelihood and increased debt burden. Many residents in Marikina were forced to find other work when the shoemaking business closed or slowed down after the typhoon (Institute for Philippine Culture, 2010). Residents took on additional informal work or additional livelihood activities in order to supplement their income; these included work as market helpers and tricycle driving, as night watchmen and as laundry women. While many urban poor residents reported that they did not have any problems in paying their debts, there were problems in doing so after the typhoon because of the lack of income and the need to undertake housing repair and provision of basic needs.

Besides the economic effects of the typhoon on poor communities, there were also other social impacts. Many urban poor residents became sick due to lack of water supplies, distressed sanitation facilities and adverse weather conditions (Porio, 2011). Many of them missed worked for several days or weeks at a time. This resulted in lost wages and increased household costs (in terms of purchasing medicines and other health related supplies) and in terms of the increase in purchasing bottled water. Some of the health issues associated with the typhoon and its aftermath included increased risk associated with polluted floodwaters and increased incidence of communicable diseases, with some cases leading to death.

Children of the urban poor were affected by the closure of schools during the aftermath of the typhoon; children were not able to absent from school for several days. Communities were also affected by the lack of electricity and loss of durable goods during the crisis. Women were especially affected by the crisis due to the fact that they had to undertake additional household chores. Also, in the aftermath of the typhoon, around a thousand families, prominently in the Marikina area, were relocated to Sta. Rosa and two municipalities in Laguna and in Montalban, Rizal.

Urban poor groups have seen the need for greater coordination among themselves and with national and local governments to effectively respond to natural calamities. For example, a national forum undertaken by the Community Organizers Multiversity, a non-government organization involved in organizing marginalized communities, late last year called for greater involvement of urban poor groups in understanding the effects of natural calamities and effective strategies to mitigate disasters. Last December, the President approved a request of urban poor

groups to declare a moratorium on eviction of informal settlements, including those living near riverside and lakeside areas and in flooded areas.

III. Institutional Arrangements and Responses in the Marikina Watershed

We examine here some of the institutions that have evolved at the national and local levels that could possibly respond to the problems in the Marikina watershed.

Marikina Watershed Protected Areas Management Board (Marikina Watershed PAMB). Created under the National Integrated Protected Areas Act (or Republic Act 7698), the Department of Environment and Natural Resources (DENR) is responsible for the development of plans related to the adoption of techniques for the sustainable use of the area. More specifically it is tasked to adopt a land use and zoning scheme for the protected area, enter into contracts and agreements with private and public entities, delegate officials, exact fees or fines for the use of the protected area, oversee construction and management of public works, sewerage, fire protection and sanitary services, and control occupancy of the protected areas. On the other hand, the board shall approve decide the allocations for budget, approve proposals for funding, decide matters relating to planning, peripheral protection and general administration of the area in accordance with the general management strategy developed by the DENR.

The management board is composed of the DENR Regional Executive Director, a representative of the provincial development and planning office, one representative each from each municipality or barangay covering the protected area, a representative of the indigenous peoples, three representatives from non-government and/or local organizations, and, if necessary, one representative of other government departments. The representatives are appointed by the DENR Secretary for a period of five years or until the term of incumbency of the local government officials had ended. As of May 12, 2011, the Marikina Watershed Protected Areas Management Board is listed in Table below.

Table 3. Members of the Marikina Watershed Protected Areas Management Board

RED Nilo Tamoria	Regional Executive Director, DENR
Engr. Cesar Cortez	Provincial Planning and Development Officer
Dr. Donna Paz Reyes	Executive Director, Environmental Studies Institute, Miriam College
Victorio Tanierla	United Neighbors Philippines
Teofilo Salcedo	Community-Based Kaunlaran Foundation, Antipolo
Atty. Danilo Leyble	Mayor, Antipolo City
Rafael Tanjuatco	Mayor, Tanay, Rizal
Wilfredo Robles	Mayor, Baras, Rizal
Rafael Diaz	Mayor, San Mateo, Rizal
Ronald Leyva	Barangay chair, San Jose, Antipolo
Rafael Diaz	Barangay chair, San Juan, Antipolo
Cecilia Laceste	Barangay chair, Pintong Bocaue, San Mateo
Marcos Seclot	Barangay chair, Pinugay, Baras
Marianito Nicasio	Barangay chair, Mascap, Rodriguez
Reyanldo Doroteo	Barangay chair, Calawis, Antipolo
Edgardo Sison,	Barangay chair, San Rafael, Rizal

Note: As of May, 12, 2011.
Source: Department of Environment and Natural Resources.

Based on interviews, the management board meets three to four times a year to primarily discuss reforestation projects in the area. As of May, 2011, it has ended 12 contracts with different private groups covering 975 hectares of reforestation. It has currently five projects covering integrated forest management, maintenance and protection of watershed, and an 'Adopt-A-Mountain Program'; two of these projects are with members of the House of Representatives.; these projects cover 1,600 hectares. There are six other pending projects covering 765 hectares, not including the proposed entry of Nestle Philippines to develop an agro-forestry farm to strengthen the livelihood of the Barangay Calawis community members.

Based on interviews with key members of the board, there are some issues in strengthening board oversight of the development projects in the area. These are:

1. Limited ownership of the board among its principal stakeholders. Most meetings of the board are held not with the principal members of the board but with their representatives, who often change, i.e., the barangay captains may send different barangay councilors as alternates in the board meetings. This may be due to partly to the fact that the NIPAS law requires members to serve without any remuneration, and therefore members may not find it attractive to attend board meetings. As a result, in the three or four times that the PAMB meets yearly, there is no quorum in one or two meetings.
2. Lack of enforcement and 'political will' of the Provincial and Community Environment and Natural Resources Officers, which are local representatives of the DENR in the province and municipalities to enforce policies made by the PAMB.
3. Mismatch among the interests of the local government board members. While the interest of the DENR and the PAMB is to limit development activities in the watershed, the interests of the local government units in the watershed is to enhance the community well-being of the settlers in the watershed by providing them with school buildings, community centers, health facilities and the like.

The last issue is problematic as this puts to the fore the reason why despite significant local government representation in the PAMB, the body has not been able to limit the development programs in the upland areas. Local government officials are also reportedly weak in the face of larger political interests that wish to control parts of the watershed area for their personal use.

Disaster risk reduction institutional arrangements. The Philippines has been described as one of the most disaster prone countries in the world. Although the country contributes very little to global warning compared to many developed and developing countries, it has been highly vulnerable to climate change effects due to its exposure to severe weather disturbances (i.e., typhoons, El Nina and La Nina weather cycles) (World Bank, 2008). At the same time, the intensification of agricultural production, the unsustainable use of forest resources and the rapid expansion of urban areas which threaten coastal and marine resources have damaged the country's fragile ecosystem (Asian Development Bank, 2009). Other natural hazards include earthquakes (the country is bisected by the Philippine fault) and volcanic eruptions (22 out of the 200 volcanoes in the country have been classified as active).

In May 2003, a research mission of the World Bank was carried out in collaboration with the Philippine government. The study (World Bank and the National Disaster Coordinating Committee, 2004) was undertaken by the World Bank in partnership with the Government of the Philippines (GoP). The study aimed to document the impacts that natural disasters have had on the social and economic development of the Philippines; assess the country's current capacity to reduce and manage disaster risk; and identify options for more effective management of that risk (World Bank and National Disaster Coordinating Committee, 2004). The study mainly identified that the Philippine institutional arrangements and disaster management systems tended to rely on a response or reactive approach, in contrast to a more effective proactive approach, in which disasters are avoided, by appropriate land-use planning, construction and other pre-event measures which avoid the creation of disaster-prone conditions. There was a widespread emphasis on post-disaster relief and short-term preparedness (forecasting, evacuation, etc.) rather than mitigation or post-disaster support for economic recovery. This much shorter term focus did not adequately emphasize identification of natural hazards as a potential obstacle to long-term sustainable development.

The study also emphasized the need to improve local governance performance in terms of disaster management planning, implementation and monitoring. While local governments are required to draw up disaster management plans, in many cases, fourth to sixth class municipalities have been unable to do so because of lack of skilled personnel and technical resources to undertake such plans. In some instances, these plans only cover relief and rescue, and not over-all disaster management as local governments are require to undertake this. Available hazards data, including their frequency, severity and consequence, are incomplete or inaccurate, and consultations have to be made with a wide-ranging range of experts to strengthen analysis and planning (National Economic and Development Authority, United Nations Development Program and European Commission, 2010).

The mechanisms in the use of calamity funds may also be problematic. Local government units are mandated to allocate five percent of their regular appropriations for relief, rehabilitation, reconstruction and other programs in connection with disasters or calamities. However, a substantial part of these local calamity funds are not utilized and those that utilize them require other resources from the national government, donors or from private sources.

To evolve to a more proactive role, the Philippine Disaster Risk Reduction and Management Act of 2010 provided a national framework for comprehensive disaster risk management. The framework defined the organizational structures and the political leadership and policy support at the highest levels, while facilitating the active engagement and implementation of stakeholders at the national, local, and household levels. Most important, the DRRM framework incorporated the essential steps of integrated risk management, which include risk identification, risk reduction, and risk sharing/financing.

At the sub-national level, regional and local disaster risk reduction and management councils (at the provincial, city and municipal levels) are mandated to develop, implement and monitor local disaster risk reduction and management plans and ensure their integration into the local development plans. The new law also provides the creation of a local disaster risk reduction and management office in each local government unit, which would be responsible for

the implementation and coordination of risk management programs in their respective areas. The LDRRMO shall be under the office of the governor, city or municipal mayor, and the punong barangay in case of the BDRRMC. The LDRRMOs shall be initially organized, composed and assisted by three (3) staff responsible for: (1) administrative and training; (2) research and planning; and (3) operations and warning. In Metro Manila, a disaster coordinating council with the Metro Manila Development Authority chair as the head and the mayors of all 17 cities and municipalities is tasked to coordinate risk reduction and mitigation activities in the metropolis.

Flooding is one of the main climate change challenges for Metro Manila, where a significant amount of area lies in the coastal area/ The Manila Bay lies west of the region and the Laguna de Bay to the southeast; the metropolis also lies between two river basins- the Pasig-Marikina river system in the eastern part of the region and the Malabon- Tullahan river system in the north (Bankoff, 2003). It has been estimated that around one-fifth to a third of the metropolitan area is vulnerable to flooding (Ballesteros, 2000; Bankoff, 2003), with only around 40 percent of the flooded areas served with pumping stations, while the rest are regularly denudated with waters as high as six meters.

The main reason for increased flooding is the rapid urbanization and the tremendous increase in the number of built up areas in the metropolis caused by the rapid growth in the population which has increased the flood water surface run-off; the construction of informal settlements in the metropolis has resulted in the constriction of waterways which in turn has diminished the volume of water discharge (Bankoff, 2003; Porio, 2011). Other reasons include the increased volume of solid waste and improper disposal of these wastes which also clogs drainage areas, inadequate flood control structure, and the lack of integrated land use planning (Porio, 2011).

Land Use Planning Institutions. Another institution that may be able to resolve the inter-jurisdictional problems in the Marikina watershed are land use planning institutions within and among the local government units. Land use plans are essential components of development plans which designates future use and reuse of the land and structures within the land within a jurisdictional planning area (Dagnalan, undated). It propels the use of the land in accordance with planned spatial organization of economic and social activities and traffic of goods and people. The legal basis of land use plans would be the Local Government Code (Republic Act 7160, sections 447 and 458), which prescribes reasonable limits and constraints in the use of property, requires adoption of a comprehensive land use plan and regulates activities in the use of the land, buildings and structures.

Additional considerations would be the following:

- Presidential Decree 933 of 1976 (creating the Human Settlements Commission); amended by Executive Order 648, series of 1981 (reorganizing the Human Settlements Commission) and Executive Order 90, series of 1986 (identifying national government agencies critical in the national shelter program); this empowers the HSC and the HLURB to approve land use plans of cities and municipalities;
- Executive Order 72 series of 1993, providing for the implementation of comprehensive land use plans of local government units; allowing the local planning and development coordinators to initiate the land use plans; devolving the approval of land use plans to provincial land use committee to assist the provincial sanggunian

and to the regional land use committee the plans of provinces, highly urbanized cities and independent component cities

- Urban Development and Housing Act or RA 7279, section 6;
- Agriculture and Fisheries Modernization Act or RA 8435, section 4;
- National Integrated Protected Areas System or RA 7586; allowing each protected areas management board to promulgate their land use and management plan
- Disaster Risk Reduction and Management or RA 10121; this allows the creation of national and local structures for disaster risk reduction and management, the framework for planning and operations and the financing for disaster and risk reduction activities

Land use plans developed by local government units should incorporate settlement policies, land protection policies, land production policies and infrastructure policies (Gotis, 2008), which should be integrated and should guide their comprehensive development plans.

However, there are several institutional problems in land use planning across local government units (Housing and Urban Development Coordinating Council, 2009). The first issue is weak LGU governance and planning capacity as around a third of LGUs have no or outdated CLUPs due to unskilled personnel, lack of recognition of role of private sector and lack of financial resources.

The second issue would be the difficulty of setting priorities across local government units; programs and projects have to meet head on with a "fractured" implementation structure composed of politically independent local government units; even across metropolitan areas where inter-jurisdictional political entities exists (such as the Metropolitan Manila Development Authority), "implementation has been spotty… and the projects usually are initiated by the private sector, foreign funded, or otherwise that coincides with an approved sectoral budget." (Housing and Urban Development Coordinating Council, 2009).

The third issue would be the perfunctory participation of the private sector and non-government organizations in planning; there are very few LGUs that undertake formal consultation activities with civil society groups in terms of planning issues. Fourth, planning and investment prioritization is difficult to achieve, especially at the local level, due to the fact that resources are driven by the political priorities.

Many studies have pointed out that the destructive effects of Typhoon Ondoy would have been minimized if a coherent land use policy had existed which took into account the need for environmental protection and the changing patterns of human settlements. These plans could restrict development in hazardous areas and reduce the number of vulnerable structures in these areas (Asian Development Bank, Japan International Cooperation Agency and the World Bank, 2010).

The Philippine Disaster Recovery Foundation (PDRF) and the Marikina Watershed Initiative. The private sector is also involved in the rehabilitation of the watershed and improving disaster risk response in Metro Manila. One such active group is the Philippine Disaster Recovery Foundation (PDRF) which will soon formalize their partnership in a Memorandum of

Cooperation (MoC). The PDRF was formed on October 23, 2009 - just within a month after the Typhoon Ondoy. As discussed above, A7 has very strong foundation with regard to DRRM framework. It is, however, noticeable that when it comes to the Marikina watershed rehabilitation activities, they rather refer to PDRF leading the implementation of tree planting, reforestation, and watershed rehabilitation.

After the devastation brought about by typhoons Ondoy, Pepeng and Frank, Philippine President Gloria Macapagal Arroyo issued Executive Order No. 838 on October 22, 2009, creating the Special National Public Reconstruction Commission to spearhead, implement and adopt urgent and effective measures to bring about the reconstruction of affected areas in the country and to address the needs of the affected population. The Public Reconstruction Commission was to "undertake a study of the causes, costs and actions to be taken in the wake of typhoons Ondoy, Pepeng, and Frank, to seek fresh aid to fund reconstruction and to enter into a partnership with private sector for the foregoing purpose." It is headed by the Secretary of Finance and its membership is composed of the Secretaries of Defense, Department of Social Welfare and Development, and Housing and Urban Development Coordinating Council and the National Disaster Coordinating Council. The National Economic and Development Authority and the Office of the Civil Defense form the secretariat.

The Public Commission was mandated to tap the resources of the private sector for the reconstruction efforts to address the continuing emergency brought about by the recent calamities. Hence, the Philippine Disaster Recovery Foundation (PDRF) was born. On October 23, 2009, a cooperation agreement was drawn up between the Public Commission and PDRF to tap the resources of the private sector and to enhance and facilitate the cooperation and coordination between the Philippine Government and the private sector in formulating and implementing a reconstruction strategy that can be implemented.

The PDRF Board of Trustees is chaired by Manuel V. Pangilinan and composed of private business and foundations, and church representatives such as Philippine Chamber of Commerce and Industry (PCCI), Universal Robina Corporation, League of Corporate Foundations, World Wildlife Fund (WWF), Philippine Business for Social Progress (PBSP), Gawad Kalinga, Social Security System, Ayala Foundation among others. The following programs are current programs of PDRF:

Early Warning System: In February the PDRF commissioned a comprehensive study to determine the repairs needed for the MMDA's Effective Flood Control and Operating System (EFCOS): a multi billion peso system of water level monitoring and control equipment spread across the metropolis. USD 40,000.00 was raised to the study, and the cost of full restoration was valued at USD1.5 million. The report has been turned over to the MMDA and DPWH. The PDRF has also brought together Globe, Smart and Sun in the agreement to allow PAGASA to place much needed rain gauges on the telcos cell sites. The cell sites' strategic locations and backup power and communication systems provide a resilient, effective network for PAGASA to utilize. The MOA signed by all three telcos is a first of its kind.

Civil Works and Infrastructure: PDRF hopes to aid in the repair of damaged schoolhouses in flood-ravaged areas. PDRF utilized converted container van technology to build

better classrooms for schools affected by the typhoons. So far two new classroom annexes have been donated to public schools in San Mateo and Cainta, Rizal, through the donation of Infosys and cooperation of the Philippine Constructors Association. PDRF supported the idea of constructing the Paranaque spillway, draining water from Laguna de Bay to Manila Bay. One possibility also that PDRF is considering is the construction of a toll road on both sides of the spillway or on top of it to help pay for the costs of the project. It is also studying the possibility of privatizing the Laguna Lake Development Authority or turning the lake over to the two water concessionaires, Maynilad and Manila Water. They could use the lake as a source of water for Metro Manila. Portions of the lake could be turned into polder islands to be used for recreation, housing and storage of sewage and water treatment facilities.

The PDRF also has programs plan for resettlement to relocate informal settlers along our waterways, particularly along the Pasig river, Manggahan floodway and Napindan channel. PDRF is working with PBSP in clearing a plan for Laguna de Bay of water hyacinths that clog the waterway and turning these into fertilizer and ladies bags. PDRF is also talking to key water supply companies to construct adequate sewage facilities and water treatment plants. PDRF is meeting with groups like the Bankers Association of the Philippines, government financial institutions and multilateral and bilateral agencies to explore creative ideas for financing low interest and long term loans for small businesses and farmers hurt by the floods. PDRF solicits funding for projects from various entities, both local and international. They are planning to work with the microfinance industry in providing alternate sources of income for informal settlers who are relocated.

Marikina Watershed Rehabilitation: The private sector initiative that directly aimed for the Marikina watershed rehabilitation is the Marikina Watershed Initiative being undertaken by environmental groups, corporate groups under the Philippine Disaster Recovery Foundation. The aim of this group is to re-forest 9,500 hectares of the 26,000 watershed reservation, undertake livelihood programs for settlers living in the area, and to assist in the development of a comprehensive watershed management plan in coordination with protected areas management board. PDRF will be launching a broad, multisectoral movement to reforest the Marikina Watershed. They based their initiative on findings of "weather and geology experts" that much of the water that inundated Metro Manila came down from the Marikina Watershed which today has only 20-30% forest cover. The approach is two-pronged. First, MWI intend to support the existing reforestation efforts currently ongoing in the area. Second, the need to draw up a comprehensive plan for the watershed, drawing on and integrating existing plans of the DENR and local governments such as Antipolo whose territory includes 60% of the watershed. MWI is exploring the idea of commercial tree farming to defray the cost of reforestation.

In a memorandum of cooperation (MoC) called the Marikina Watershed Protection, Rehabilitation, Management and Sustainability Initiative, the PDRF signed on 21 July 2010 along with representatives of government, business corporations, foundations, church, NGOs and two Barangay LGUs inside the watershed, with very specific roles of each spelled and defined in the MoC.

While the PDRF Marikina watershed initiative is a commendable effort from the private sector, providing human, financial and technical resources to improve the sustainability of

natural resources in the watershed area and to assist in disaster risk reduction in Metro Manila, given the magnitude of the work would be much greater than provided by the private sector.

IV. Marikina City and the Alliance of Seven (A7)

This part is the discussion of the Alliance of Seven (A7) as one institutional innovation in solving some of the institutional constraints with regard to the management of the Marikina Watershed. This section will discuss a timeline in the creation of the coalition and some of the key events in the work undertaken by the group. This will also discuss the motivation of some of the key players in organizing the group.

Typhoon Ondoy was a fresh memory of the worst that can happen in 2009, but also brings out some best of motivations in preventing a repeat of the disaster. In 20 July 2010, the Marikina Disaster Readiness Alliance (MDRA) was organized through the initiative of the freshly elected (first termer) Mayor Del de Guzman. A Memorandum of Understanding was signed between the City Government of Marikina and other stakeholders namely: Marikina Valley Chamber of Commerce and Industry; Rotary Club of Marikina; Peoples Council of Marikina; and from civil society Resilience a group of NGOs advocating for disaster-ready cities and communities. The MDRA is a partnership among the LGU, private sector and citizens' groups towards disaster preparedness and risk reduction.

Mayor de Guzman and Resilience, however, recognized the tiny geographic influence of Marikina and MRDA over the vast area covered by the upper and lower Marikina Water Basin. This is when the Mayor started to reach out to other local executives of Rodriguez, San Mateo, Cainta and Antipolo City of Rizal Province, and Pasig City, Metro Manila. The creation of the grouping was also based on the suggested made by a member of the Resilience group, the La Liga Policy Institute, which had been serving as the secretariat of the Alliance and was working with specific local government units in the Pangasinan province in order to coordinate enterprise development and livelihood activities. It was also suggested that a more integrated or holistic strategy to respond to disaster response should be undertaken, including vulnerability assessment, the creation of 'early warning systems', and resettlement and rehabilitation of communities affected by the natural disasters.

By September 26, 2010, exactly a year after Ondoy, six local government units- Marikina, Pasig, Antipolo cities, and the municipalities of Rodriguez, Cainta and San Mateo in Rizal province- banded together with Resilience to work together for improved coordination, pool and share knowledge and resources in the quickest possible time in order to provide appropriate and timely interventions among its constituencies. Their aggrupation has been called formally the Marikina Watershed Environs Integrated Resource Development Alliance, or now informally the 'Alliance of 7'. A seventh local government unit, Quezon City, joined the alliance informally in January, 2011, and more formally in July, 2011.

The following Mayors signed the MOU: Marikina City Mayor Del R. de Guzman, Pasig City Mayor Robert C. Eusebio, Antipolo City Mayor Danilo O. Leyble, Municipality of Cainta Mayor Ramon A. Ilagan, Municipality of Rodriguez Mayor Cecilio C. Hernandez, Municipality of San Mateo Mayor Jose Rafael E. Diaz, and Quezon City Mayor Herbert Bautista. Mr. Horacio R. Morales signed in behalf of Resilience. Resilience is composed of H.R. Morales

Management and Consulting Corp. (HRMMCC), Education for Life (ELF), La Liga Policy Institute (La Liga), The Philippine Rural Reconstruction Movement (PRRM), and Convergence for Community-Centered Area Development (Convergence).

The Alliance agreed to seek and mobilize various development stakeholders within the Marikina watershed and its environs to include local governments, the private sector, NGOs, and communities around the issue of disaster preparedness, disaster risk reduction and in-city development. The Alliance officially designated Mayor Del R. De Guzman as the lead LGU coordinator or Lead convenor to facilitate activities of the Alliance, and in charge of the Executive Committee composed of LGU chief executives. The Alliance also agreed to appoint La Liga as its working Secretariat in charge of the day-to-day coordination among members of the alliance. A technical working group of all disaster risk reduction (DRR) officers was also created to finalize the plans and monitor agreed upon projects.

The A7 defined the following arena of engagements:

1. Assist in the establishment of the 'in-city' development plans and pro-active disaster readiness and response program;
2. Develop a unified and coordinated inter-local responses and mechanisms framed within a sustainable and climate sensitive development plan for Marikina watershed and its environs;
3. Promote partnership mechanisms among LGUs and key stakeholders in the six identified areas;
4. Craft innovative LGU approaches and models for effective governance;
5. Initiate policy harmonization among local governments to facilitate effective responses to disaster and risk reduction measures; and
6. Assist in the mobilization and sharing of resources for immediate and medium-term project and program interventions.

The most notable and actively pursued among the above engagements, based on interviews of LGU representatives, are coordination in pro-active disaster readiness and response program. The is partly facilitated by the creation of local DRRM units in LGUs as mandated by the Philippine Disaster Risk Reduction and Management (PDRRM) Act of 2010 which will be briefly discussed below.

From January to June, 2011, The A7 and Resilience conducted a series of planning workshops to formulate an A7-wide DRR Program. The comprehensive program aims to reduce the risks and better management of the vulnerabilities of the A7 communities to inherent disasters and hazards in their areas such as floods, landslides and earthquakes. The program stated prior information and knowledge of international and local agreements and legislations on DRRM, i.e. the Hyogo Framework for Action 2005-2015, the 2007 Delhi Declaration on Disaster Risk Reduction in Asia, and the United Nations Framework Convention on Climate Change (UNFCCC), the PDRRM Act of 2010, and the Climate Change Act of 2009. The A7-Resilience 2011-2013 Integrated DRRM Program aims to increase the resilience and adaptive capacity of A7 communities within the Marikina Watershed. Specifically, the program aims to:

1. Establish an A7 DRR baseline detailing the vulnerabilities and risks as well as the capacities and needs for an effective DRR management
2. Establish an A7-wide integrated early warning and command system
3. Rehabilitate and reforest the Marikina Watershed
4. Identify communities at risk and develop in-city and inter-LGU resettlement and relocation measures; and,
5. Identify and construct DRR-informed and effective infrastructure projects.

There are five (5) components of the A7-Resilience DRRM Program which is composed of identified key result areas and corresponding key activities. These are:

1. Disaster Vulnerabilities, Capacities and Needs Assessment
2. Early Warning System, Command Integration and Contingency Planning
3. Rehabilitation and Reforestation of the Marikina Watershed
4. Resettlement and Relocation of Communities at-risk
5. DRR-informed and effective infrastructure development

It was agreed that local ordinances or laws should then be geared towards responding to the DRRM plans.

Funds for the five components were also indicated in the comprehensive program with a total of 38.3254 billion pesos including 3.7345 billion peso local counterpart of A7-LGUs. The bulk of the budget is with component five on infrastructure development with a total 28.895 billion pesos. The managing director of La Liga Policy Institute, Roland Cabigas, said a review of the 2011 budget reveals that A7 may tap funding support from at least eight national line agencies with climate change and disaster risk reduction mandates (Interview with Roland Cabigas, July 8, 2011). For disaster vulnerabilities, capacities, and needs assessment, Cabigas said there is a list of programs with total funds of P5.7 billion from which A7 can seek funding support; P16.2 billion for early warning systems and disaster-contingency planning; P5.8 billion for reforestation and sustainable agriculture; and P4.4 billion for resettlement. Funding for such, Cabigas said, can be sourced from the Climate Change Commission under the Office for the President, DILG, NDRRMC, DND, DOST, DPWH, DENR, and MMDA (Editorial, People's Journal, March 2011).

Local government officials signing the Memorandum of Agreement (MOA) including Quezon City as part of the Alliance of 7. This was held at the Quezon City Hall last July 15, 2011.

Mayor Herbert Bautista providing the keynote speech during the MOA signing.

One key unifying activity done together by A7 was the Marikina river inspection, navigating and identifying obstructions of the river flow as tropical storm "Chedeng" (Songda) threatens to dump rains on Metro Manila (GMA News Online, 2011). The river inspection happened just after a few days of the news of a controversial land project, Circulo Verde, that Marikina City officials claimed had encroached on the river. Mayor Del de Guzman quoted an MMDA official accusing Circulo Verde Project as a cause of the river constriction (Calleja, 2011).

During Typhoon "Falcon" last June 2011, the A7 officials again coordinated with each other, constantly monitoring the Marikina river water level, the amount of rainfall overall including in the watershed, and directly coordinated with the MMDA personnel in charge with the Mangahan Floodway. Typhoon Falcon brought rains that triggered floods, requiring emergency evacuation of people in low-lying and flood-prone areas, but the damage was very minimal, which some quarters say, was due to heightened awareness by community members and increased coordination by local officials.

> *Before Ondoy, residents in flood prone areas of Barangays Nangka and Malanday in Marikina had to be convinced by the Marikina Settlements Office (MSO) officers to evacuate. An early warning system was developed years before the typhoon by the MSO and community evacuation is decided based on the level of water in the Marikina River. A fifteen meter flood water level at the Santo Nino monitoring station triggers a warning where sirens are heard by communities beside the Marikina River. At the 16 meter level, a second siren different in frequency from the first is also heard advising evacuation; MSO staff assist and guide the evacuation process. At the 18 meter level, a third siren is sounded and residents are forcibly evacuated. There had been no substantial change of the early warning system on water levels and evacuation. However, on the side of the communities, during Falcon, they volunteered to evacuate themselves when the second siren is sounded, unlike during Ondoy when residents still had to be convinced before moving themselves out of their houses.*

This is also true in Malabon where residents also voluntarily left their homes after emergency officials informed them of the rise in floodwaters. Community members have better information on the evacuation sites which they can utilize during emergencies; during Falcon, those affected by the floods utilized also health centers and multi-purpose covered courts, which was encouraged by local officials to reduce cramping in the school buildings and improved the health and sanitary conditions in evacuation sites.

On the side of the Marikina LGU officers they monitored also water level reports from Montalban and San Mateo, located in the upstream of the Marikina rive, and even downstream in Cainta, before and during Typhoon Falcon. Because of foreign assistance provided after Ondoy, additional monitoring stations had been constructed in Nangka, Tumana, Sto. Nino, Marikina and in Angono, and the information is available in a website in real time. Aside from this technical, accurate and systematic measurements on water level and rainfall, LGU officers across towns and cities had constantly communicated among themselves through telephone conversations and text messages. The Alliance of Seven has reinforced this positive relationship between LGUs in sharing information.

A7 officials also held a meeting with the DPWH Secretary Rogelio L. Singson to discuss the agencies' flood control projects. The meeting resulted in the recognition by Secretary Singson that the flood control projects undertaken in Metro Manila should be coordinated with infrastructure projects undertaken near the watershed area. The A7 plans to have several subsequent meetings with other Cabinet secretaries in order to integrate their area plans with national priorities.

One directly observable behavior among A7-LGU staff and personnel is their very animated desire to band together, share resources, and communicate with each other. This is very notable among the staff in the local disaster risk reduction and management offices (LDRRMOs). The awareness of this approach on DRRM is notable among LDRRMO staff. While visually noticeable are local rescue teams organized and trained with their equipments, DRRM planning is slowly integrated into the local development plans. The nature of the A7 banding together under the DRRM framework is understandable, given the common disaster risk the LGUs face on flooding of the Marikina river basin as experienced during Ondoy.

Although there is now emphasis on long term DRRM planning, the day-to-day work of LDRRMOs is to respond for immediate rescue operations. The nature of disaster and accidents are multi-faceted. Depending on the geographic character such as urban, rural, mountainous terrain, high buildings, rescue operations are disaster or hazard-specific. Thus local rescue teams tend to specialize on skills base on actual experience and the most probable hazard in their localities they have to prepare. For example, Pasig and Marikina teams have specialized expertise and equipment on responding to vehicular accidents that includes freeing trap motorists in twisted metals in severe smashed up incidents. Montalban or Rodriguez has the experience and knowhow in mountain rescue operations, while Antipolo may have the most number of experiences on landslides accidents. There have been indications that Quezon City, for example,

could also share disaster risk reduction resources with LGUs nearer the watershed to reduce risks originating from the mountain areas.

While almost all members of A7 are involved in flood rescue, this does not mean the experience and expertise are common knowledge, but instead, there is plenty of desire of teams and volunteers to share experiences on early warning system, evacuation, difficulty of specific cases of flood rescue, equipments' use and applicability, disaster preparedness briefing and volunteer mobilization, among others.

Among the different local government units, there has been more regular orientation and consciousness raising activities, including drills and lecture sessions, on disaster mitigation in poor communities which has been the result of increased awareness also by community groups of the effects of typhoons in the recent past. The Quezon City disaster risk reduction office, for example, also plans to undertake several hazard mapping activities with community based organizations, especially in the Commonwealth areas. The Marikina Settlements Office (MSO), which is in charge of disaster risk mitigation in urban poor areas, has been undertaking capability planning and stakeholding sessions with urban poor organizations. The MSO has reported that urban poor residents near the banks of the Marikina River have been voluntarily evacuating themselves when river waters reach critical levels during typhoons.

> *The capability planning specifically refers to community orientation meetings done before the onset of the rainy and flood season. These community meetings serve as disaster readiness and preparation usually pertaining to the warning system, identifying people and officers in charge in case of emergency and evacuation, and assigned community evacuation centers. As mentioned above, flood prone communities are hard to convince to move out of their houses for emergency evacuation unlike after the Ondoy flood.*

> *The problem of informal settlers living alongside rivers and creeks has been partly solved in Marikina before Ondoy. The local government has already cleared easement area at three meters from creek embankments when the bike lanes were constructed nearly ten years ago. After Ondoy, the Marikina LGU relocated more than a thousand families from Balubad, Barangay Nangka and Bagong Sibol, Barangay Concepcion Uno, with the help of the National Housing Authority.*

Until now, there is very little coordination between urban poor groups and the A7 organization. However, during their August 19, 2011, technical working group, the A7 has recognized the need to develop a long-term program for disaster mitigation that would include training for non-government organizations and people's organizations in hazard warning and early warning systems development. In Quezon City and Marikina, there have been working arrangements that have been developed between local government units and the communities, that are most prone to flood risk (Bagong Silangan in Quezon City, Malanday, Tumana and Dona Petra in Marikina) to reduce these risks without resorting to relocating these areas. However, in other areas, such as Pasig and Cainta, there is also some recognition that the local government units should be more involved in the development of a comprehensive rehabilitation plan for informal settlements, which is now being overseen by the national government.

While the first two components of the A7 plans (assessment of disaster vulnerabilities, development of early warning systems) have been undertaken, as of this writing, common alliance activities for the rehabilitation of the watershed needs to be planned. Key informants noted that the latter was being undertaken by the PDRF, but was not yet undertaken by the A7 itself. This may be partly due to the multitude of interests that the different local chief executives in the A7 would have to consider in developing a long-term land use plan for the watershed. Nevertheless, the civil society partners working with the alliance remain optimistic that the A7 Execom would be able to tackle this issue in the next few years, as soon as the chief executives would have implemented more common activities which would make them more comfortable in tackling more difficult issues.

V. Analysis and Recommendations

This section will try to identify issues of the watershed as a geographic definition of human development outcomes and the institutional challenges that lie ahead giving significance to the formation of A7. There are several issues that arise from the use of the watershed and we therefore place the A7 as an institutional innovation for moving forward to improve human development outcomes within the geographic influence of the watershed.

- *Marikina watershed as a source of water*

  Watersheds are very important source of water that is essential to sustain human development and activities, but the Marikina watershed is not anymore used as a source of water for Metro Manila. The country is blessed with multiple watersheds such that the metropolis sources its water from the La Mesa and Angat areas, shifting away from Wawa in the Marikina watershed. Because the watershed is not seen as a strategic source of water, the national government has shifted its priorities away from completely preserving its forest resources towards utilizing it for other purposes (i.e., as settlement areas, as landfill site), as indicated by several Executive Orders that were released since the 1970s. The recent interest that the national government and the private sector have made on the watershed is due to its possible role in mitigating disaster risks that was experienced during and after Typhoon Ondoy. Therefore, institutions such as the A7 primary interest in the watershed would be in terms of disaster risk management.

- *Marikina watershed engages a multitude of stakeholders*

  The Marikina watershed covers a large area; the size of the reservation is about 28,000 hectares, and it affects wider areas outside the reservation especially the downstream areas of Rodriguez, San Mateo, Marikina, Pasig, Cainta, and Taytay. Because of the large area coverage, the national government, which has the financial and technical means to do so, is the only institution that can protect the interest of the majority whose state of welfare and human development will be adversely affected in the case of abuse of the watershed's resources. As the national government seems to have tended to shy away from this role, then the interest of a multitude of actors within and outside the watershed reservation becomes

difficult also to coordinate, from the LGUs which has direct jurisdiction over parts of the watershed area, to the legal and informal settlers, private interests within the watershed, and the local government units and the population outside the reservation but are affected downstream during floods.

The lack of engagement of the national government over the use of the resource has become a window of opportunity for other interests in the use of the watershed land. The settlers have interest both on subsistence use of the watershed resources as livelihood as well as real residential property near the NCR. The politicians both have an interest on the voters who live in the watershed area and probably more on the value of the land for the LGUs, same with the informal settlers, since it is near the NCR. The downstream LGUs and residences have a different interest which is the natural preservation of the watershed to mitigate and protect them from flooding.

- *Informal settlers' livelihood, jobs, the economy and the law*

  Most of the upland informal settlers live on subsistence lifestyle relying on the natural resources offered by the watershed. They will continue to be dependent on the watershed since it will take time for the national economy to prosper, and faster job growth to be established. Thus, the settlers will continue to rely on subsistence farming, *kaingin*, charcoal making, small timber and collection of non-timber forest products. Thus, an important consideration in watershed preservation is to be able to provide alternative livelihood opportunities that do not inflict damage on the watersheds' natural function in the ecosystem.

  Also, given the recent attention to the watershed as a means of mitigating flooding in Metro Manila, this could be one of the ways that the national government, together with the existing local government units and with concerned non-government organizations and marginalized groups, to develop a more comprehensive program for the preservation of the watershed, and the protection of the eco-system in the downstream areas. Among civil society groups, there is some recognition that there will be some displacement of interests, i.e., environmental groups have recognized parts of the watershed may have to be used for socialized housing, urban poor groups have recognized that some of the informal settlers living along the Marikina and Pasig river banks would be relocated, but before this should happen, the national government should be able to develop a inclusive program for rehabilitation that is understood by all. Local governments can play a process in mediating the interests between the national government and civil society groups.

- *Institutional arrangements and natural watershed geography*

  One of the reasons for institutional design failures has been a misfit in terms of size of the resource vis-à-vis the capacities of the governance arrangements for its preservation, maintenance, and use. While the national government has equivocated on the preservation of the watershed, local governments on the other hand have very meager resources to resolve the differing conflicting interests in the watershed. LGUs located in the downstream areas, such as Marikina and Pasay, while having significant clout, do not have jurisdiction of the watershed. The stakeholders and groups of people involve are too diverse with asymmetric

interests (i.e., differing valuation, dependence and expected future use of the resource). With the huge area covered and the multitude of actors with a stake, it is more costly to communicate and arrive at agreements of its maintenance and use. But the Ondoy flooding and the formation of A7 put the Marikina watershed in an interesting spotlight, regaining back the interest at looking at the institutional arrangements governing the watershed.

- *Institutional responses and A7*

  Although the A7 has been organized under a DRRM framework, eventually it has to deal directly with the Marikina watershed reservation, which it does so in the plans that it created. Under the Ostrom framework cited above, this is due to the fact that local actors have better information of the effects of the watershed on their wellbeing and strengthened the efforts in terms of local coordination and bargaining in the use of the common resource.

  Increased awareness among local government officials on the effects of Typhoon Ondoy and the effects of the destruction of natural resources on disasters have strengthened coordination among local government officials. Important key players such as the Marikina Mayor Del De Guzman- who brought about the key local government chief executives, and the civil society represented by the La Liga Policy Institute, who had experience in organizing alliances of local government units, bringing expertise in mediating the dissimilar interests across different LGUs and stakeholders in the process.

  There is no doubt that A7 is a good institutional innovation which has responded to the geographic definition of the watershed. Given the limited term of office of local government officials, there are moves to sustain the coalition for a longer period that the terms of office of the members of its executive committee. However, it is important in the long-term to develop mechanisms within the alliance to enable them to solve more problematic issues, such as the need to develop a common land use policy for the watershed.

  Another suggestion that has been broached by some members of the A7 secretariat is the creation of a watershed authority to ensure preservation and conservation of water source and river flood control system that drains from the watershed. This may sidestep the problems of more contentious bargaining over the use of the watershed, but may have problems in terms of ownership of the decisions.

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- Atty. Daniel Nicer, Assistant Secretary for Anti-Corruption and Internal Audit, July 12, 2011, Quezon City

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- Ms. Aida Ceniza, Marikina Watershed Protected Area Supervisor, July 25, 2011, Quezon City, and August 5, Antipolo City.
- Ms. Liesl Lim, Consultant, Philippine Disaster Recovery Foundation, July 26, 2011, Quezon City.
- Mr. Eric Arevalo, Head, Department of Public Order and Safety, Municipality of Cainta, July 26, 2011 and March 22, 2012, Cainta.
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