

Rola, Agnes C.; Francisco, Herminia A.

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Realities of Watershed Management in the Philippines: Synthesis of Case Studies

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Philippine Institute for Development Studies
Surian sa mga Pag-aaral Pangkaunlaran ng Pilipinas

Realities of Watershed Management in the Philippines: Synthesis of Case Studies

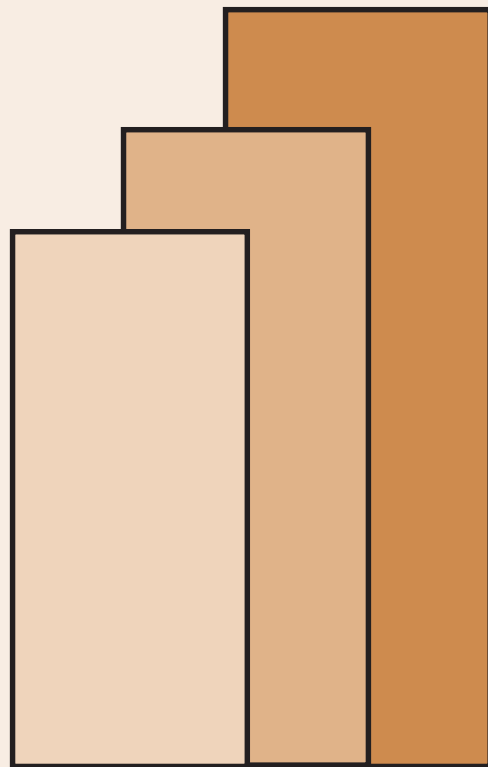
Herminia A. Francisco and Agnes C. Rola

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For comments, suggestions or further inquiries please contact:

The Research Information Staff, Philippine Institute for Development Studies
3rd Floor, NEDA sa Makati Building, 106 Amorsolo Street, Legaspi Village, Makati City, Philippines
Tel Nos: 8924059 and 8935705; Fax No: 8939589; E-mail: publications@pidsnet.pids.gov.ph
Or visit our website at <http://www.pids.gov.ph>

Realities of Watershed Management in the Philippines: Synthesis of Case Studies

Abstract

This paper presents a synthesis of four case studies of watershed management experiences in the Philippines, primarily to provide insight on why watershed management approach has not gained wider recognition in the country despite being renowned internationally. A brief description was presented for each case study involving the watersheds of Maasin, Magat, Manupali, and Balian sub-watershed to account for their critical role as water supply support systems to downstream communities. It provides highlights on various initiatives undertaken by the Local government Units, NGOs, private sector etc in their effort to protect these watersheds from environmental degradation. The case studies have shown that that the effective implementation of watershed management requires some level of financial capital, a community or group of communities with good enough level of intellectual and social capitals, and the presence of a legal and institutional framework to support the watershed approach. The level of these various forms of capital vary across watershed, thereby leading to differences in the level of watershed management implementation as well. The study also puts forward the need for payments of environmental services as previous initiatives undertaken by national forest protection programs and other community-based livelihood activities and reforestation projects are just short-lived management initiatives.

Keywords: financial capital, intellectual and social capital, legal and institutional framework, watershed management approach

Realities of Watershed Management in the Philippines: Synthesis of Case Studies

By

Herminia A. Francisco & Agnes Rola

Introduction

This paper puts together the results of four case studies on watershed management in the Philippines. The case studies were carried out to assess why the watershed management approach, while fully supported by policy pronouncements in the national and international scene, is not taking place on a wider scale. The case study focused on the elements that are present or absent in the various watersheds—as they affect the implementation of watershed management approach. These elements are categorized into legal & institutional infrastructure, social capital, financial/economic capital and technical & administrative capital of the watershed managers (Figure 1).

The legal and institutional infrastructure provides the legal or legislative basis to support the management of the natural resource areas following the ecosystem approach—in this case, by manageable watershed units. The term 'manageable' is critical in the identification of the planning unit as watershed size varies widely from less than a hundred hectares to several thousands hectares. The bigger watersheds are commonly referred to as river basins while the smaller units, are sometimes called, sub-watersheds or micro-watersheds. The river basin is divided into multitudes of watersheds. Under ideal situation—the various watersheds that make up the river basin should be managed in ways that protect the overall integrity of the river basin—but this ideal system may be hard to achieve, especially if large portions of the river basins are already degraded or beyond repair.

Given limited resources and the many watersheds that need attention, priority is generally given to what are considered as critical watersheds. Several criteria define what constitute a critical watershed but the most important criterion —being the support that the watershed provides to downstream communities—such as irrigation water users, domestic water consumers, hydroelectric companies, or combinations thereof. Indeed, the important role of the watershed as a 'water supply support system' has always been the driving force in the urgency to put these watersheds under appropriate management.

Watershed management requires various forms of resources or capital to support the activities that 'natural resource management' entails. The task is made more challenging by the fact that most of these watersheds have already been turned into settlement areas. The institutional capital includes political (local government unit--LGU) support to the whole idea of pushing for the watershed-based water resource management strategy. The LGU support should come from the political units closest to the watersheds—which usually consist of the municipalities and barangays that are found within the watershed, both those living in the uplands and in the downstream areas. The creation of watershed management council or task forces is also an important institutional infrastructure that could help implement watershed management initiatives. This council is important given that there are various interest groups found in the watershed, some of them having conflicting interests on the resources found therein—and hence, would have different perspectives on how the watershed shall be managed. In some cases, the institutions may simply include different user groups and coalition of said groups—but whatever forms they take—for as long as they share the same goal of achieving watershed protection—then, the watershed management strategy has a good chance of succeeding.

Closely linked to institutional capital is social capital—which roughly refers to collective action by local community members who live and/or affected by the state of the environment in the watershed. They include both the upstream communities and the downstream communities that are made up of the household sector, industries and commercial establishments, and other interest groups in the area. Without the support of these various groups of people—it is difficult to foresee a situation wherein efforts to protect the watershed would succeed. By collective action, we mean active involvement in watershed protection efforts, either through direct involvement in carrying out the various activities or through financial support to these undertakings. The participation of the people as partners in resource management is sought for.

Looking at the people who are directly involved in the management tasks—it is clearly important that they should be equipped with some forms of intellectual capital such as the technical skills necessary in watershed management and the required supporting administrative skills. If the capability of the resource managers is short of what the minimum requirement is—then, the success of watershed management initiatives is under threat.

Finally, the building up of the various forms of capital just described requires financial resources. Technical capability building requires

investment of training on the various aspects of watershed management. Administrative and financial skills require separate training programs that also would entail financial resources. The various efforts to mobilize peoples support, through information, education, and communication (IEC) efforts, advocacy programs, training and meetings, and many others all entail cash outlays. Ultimately-the site development activities such as reforestation, agro-forestry development, assisted natural regeneration and construction of needed infrastructures –all entail financial outflows. The money has to come from somewhere—and in the Philippines as in other developing countries—they mostly come from external sources like development and/or environment programs. But other sources do exist as well, such as the national governments, LGUs, Non-government organizations, and even communities.

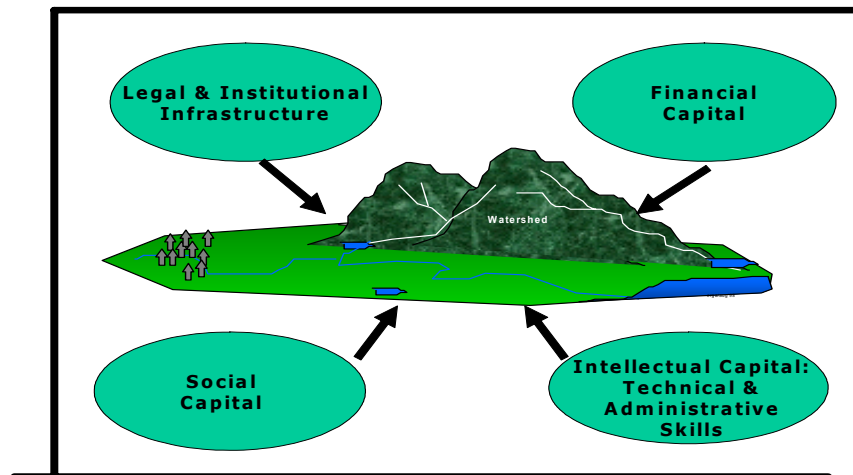


Figure 1. Elements of Watershed Resource Management Program

The analysis focuses in identifying the presence or absence of the above-mentioned elements in the four watersheds that were analyzed for this report. This synthesis starts with a brief description of the four watersheds. The analysis of the watershed management experiences was then presented in relation to the various elements shown in Figure 1. The concluding section sums up some recommendations on how watershed management approach may be promoted in natural resource management of the country.

Brief Profiles of the Case Study Watersheds

The Magat Watershed

Among the four cases studied, the Magat case is the biggest covering 234,824 hectares and is located in portions of Nueva Viscaya, Quirino, and Isabela provinces in Northern Philippines. It provides water to the Magat multi-purpose dam for various uses such as hydroelectric power generation, irrigation, flood control, domestic water supply and other water uses. In terms of capacity, the Magat dam could store 1.08 billion cubic meter of water that could irrigate 950 hectares of farmlands and generate 360 megawatts of power. The Magat River is the main tributary for the Magat Dam but it also receives water from the Santa Cruz, Santa Fe, and Marang Rivers.

Of the total land area, 30% are declared alienable and disposable, with 70% classified as forestlands. Forested portions of the Magat watershed are under the control of four institutions. The Lower Magat Forest Reserve (24,241 hectares) is under co-management of the local government unit of Nueva Viscaya and the Department of Environment and Natural Resources (DENR). The 60,431 hectare Imungan-Cabanglasan Sub watershed is under the DENR. The Dupax watershed (424.8 hectares) is also managed by DENR while the 439-ha Barobbod Watershed was devolved to the LGU. The 1998 Landsat TM Imageries revealed that majority of the land cover are grasslands. Despite large portions of the area under cultivation, the biodiversity and endemism of wildlife are still considered high in portions of the watershed.

Given these situations—sedimentation of the Magat Dam is a serious problem. The sedimentation problem was aggravated by the 1990 earthquake. Sediment volume increased from 7.4 million cubic meters to 213 million from 1982 to 2000. Forty one percent of the area is suffering from slight erosion and 27%, with severe erosion.

The watershed population as of May 2001 was 483,411 with Nueva Viscaya accounting for 76% of the total population.

The Manupali Watershed

The Manupali watershed in Bukidnon forms part of the Upper Pulangi River Basin, and also of the Mt. Kitanglad Range Natural Park, where its headwater lies. Sixty percent of the land area of the Manupali watershed is occupied by the Municipality of Lantapan, and the remaining 40%, is found in Valencia. The Lantapan occupies the upland

portion of the watershed while Valencia is in the low lying area. Since the critical part of the watershed is the upland areas—most of the watershed management initiatives have been concentrated in the Lantapan portion of the watershed.

There are 220 streams in the Manupali watershed that traverse 636,000 meters and drains to some 40,000 hectares of agricultural lands. The lands that make up the watershed are delineated into alienable and disposable lands and forestlands. In terms of land use, a significant part of the area is under intensive agricultural cultivation. In Lantapan, for instance, 54% of the land area is devoted to agriculture.

Based on analysis of situations in four sub-watersheds in Lantapan, it was established that both water quality and quantity are degrading through time (Deutsch and Oprecio 2004), and this was found to be caused by soil erosion and by human waste contamination.

The Maasin Watershed

The Maasin watershed is a 6,150 hectare land-area that forms part of the Tigum-Aganan watershed; it is headwater source of the Metro Iloilo Water District (MIWD) that supplies the water requirements of Iloilo City. This part of the Tigum-Aganan watershed has been the subject of early site development efforts on account of its critical role to the water supply of the City. The birth of the Iloilo Watershed Management Council in 2000 formalizes the need to manage all the watersheds of the province of Iloilo, to avert the impending water supply problem. The Maasin watershed falls under the Tigum-aganan watershed, and is governed by a watershed management board.

The Tigum-Aganan Watershed in turn is 29,700 hectares in size, 10,400 hectares of which is located in the Aganan watershed and the rest (19,300 hectares) falls under the Tigum watershed. In terms of land classification, there are 11,250 hectares of forestlands within the watershed and 18,250 hectares of alienable and disposable land. The forest vegetation covers only 4,000 hectares however, with brush lands consisting of 19,500 hectares. Rice paddies were estimated at 1,700 hectares while areas devoted to other crops come to around 4,100 hectares.

The entire Tigum-Aganan watershed is home to eight (8) municipalities and one city, namely: Maasin, Cabatuan, Sta. Barbara, Pavia, Leon, Alimodian, San Miguel, Oton, and Iloilo City. Of these, three are upland watershed: Maasin, Leon, and Alimodian. Together, they

account for 23% of the watershed population. Some 309 barangays are found inside the Tigum-Aganan Watershed.

Balian, Pangil Sub watershed

The smallest watershed included in the four case studies is the 31-hectare forest watershed found in the Barangay of Balian, municipality of Pangil. This area is located at the slopes of the Sierra Madre Mountains and is inhabited by 4,712 people comprising of 1,100 households by the year 2000. Most of the inhabitants reside along the coastal area situated along the national highway. Rice cultivation is common in the downstream areas while the uplands are devoted to planting of coconuts, bananas, citrus, coffee, fruit crops, root crops and bamboo cultivation. Portions of the uplands are also covered by cogon grass (*Imperata cylindrical*), which was previously forested areas. Some remnants of secondary growth forest still remains with indigenous forest plant species such as rattan, giant fern, edible fern and others. Forest tree species comprising of narra, mahogany, and acacia are also found in the area which are planted by the community in efforts to protect the watershed areas. The water supply of the community comes from this watershed; hence, this is considered an important resource by the people.

Watershed Management Experiences in the Case Study Sites

Magat Watershed Experience

The case analysis carried out by Elazegui and Combalicer (2004) provided the basis for the discussion in this section.

The important role of the Magat watershed to Region 2 residents and to the Nueva Viscaya folks in particular, since 97% of the watershed belongs to this province, has led to massive inflow of financial and technical support to the watershed. The inflow of these resources was made possible through various government programs with funding provided by external actors, both financial institutions like the OECF in Japan and the Asian Development Bank and Conservation Organizations like the Conservation International.

The Magat watershed was declared a forest reserve in 1969 through Proclamation 573. Control of portions of the area has been granted to different institutions, like the NIA, which is given the authority to manage, develop, protect, and maintain the Casecanan River Watershed Forest

Reserve and the Pantabangan-Carranglan Watershed in Nueva Ecija. DENR retains control over all land clearing and timber cutting activities in the area. There are also portions of the area under the National Commission on Indigenous People (NCIP) on account of the presence of indigenous cultural communities in some upland areas. Finally, joint management of the watershed between the LGU and the DENR was formalized through the Memorandum of Agreement (MoA) between the two parties. In 1997, small watershed management areas were established in each municipality through similar MoA between the municipal LGU and the DENR. This demonstrates the operationalization of the devolution of authority dictated by the National Government.

In terms of watershed management initiatives, the DENR with funding from JICA has recently completed the Master Plan for watershed Management in the Upper Magat and Cagayan River Basin. Data to support said master planning came from pilot studies that were conducted in 880,000 hectares of these two watersheds. The Plan provides recommended watershed management initiatives in the Upper Magat watershed to effect an improvement in the biophysical conditions of the area and also of the living conditions of the people therein. It also recommends a system of water pricing to generate resources that will support the LGU's efforts in watershed management. Implementation cost of said Plan was estimated at PhP 573.3 million. No such funding has been committed yet for the watershed.

Nonetheless, there were several projects already implemented in the area with funding from the national government through the DENR and the LGU allocations, international organizations like the Asian Development Bank through the Forestry Sector Project, and the International Tropical Timber Organization (ITTO), and other government organizations like the National Power Corporations (NPC) and the National Irrigation Administration (NIA). In terms of fund commitment, DENR has a yearly allocation of PhP2.6 million for natural forest protection and PhP1.6 million for soil and water conservation measures. The NIA and NPC also allot portion of their budget for watershed protection¹ of the headwater since water supply is critical to their agencies' mandate. The DENR has also implemented several reforestation projects in the area and has also areas covered by the Integrated Social Forestry Program and the Community-based Forest Management Program. Overall, however, the implementation of a comprehensive management plan is still lacking and

¹ NIA spent PhP3 million for reforestation, maintenance and forest protection but this was only for a year. NPC spent PhP2 million for regular patrolling and PhP2.7 million for information dissemination on why people should protect the watershed.

is something that needs to be pursued in the years to come. In addition, a unified management structure of the whole watershed can rationalize the funds and programs that have evolved in the area.

The implementation of watershed management initiatives in this area depended substantially on the intellectual capital of those involved in direct implementation of these various watershed initiatives. To this end, the Nueva Viscaya State Institute of Technology (NVSIT) has played a key role in providing technical support to said efforts and also in providing both formal and non-formal training on watershed management. The DENR units based in the area, such as the PENRO and the CENRO have capable staff with watershed or forest management training. Even NIA and NPC maintain their own watershed management units. It would appear that the intellectual capital of those involved directly in the management of Magat watershed is relatively high. How to harness this for successful watershed management plan implementation remains a challenge.

The important role of the local government unit in mobilizing social support and generating financial capital for the watershed is important. This proved to an important element in the Magat watershed where co-management of the area by the LGU and DENR is in effect. This scheme came about because the LGU declares it wants to be involved actively in protecting the watershed. Since 80% of the area belong to the Nueva Viscaya government—this interest is not really surprising but speaks highly of the commitment of the LGU in natural resource management. The LGU liaise with the people groups and the private sector in getting their support to help in watershed management initiatives—most particularly, on the social and livelihood issues. Specifically, it provided capability building activities to empower peoples' organizations and worked on linking these groups to entrepreneurs through livelihood projects. There are 18 Pos who belong to the Upland Farmers' Federation and these groups, with membership ranging from 25 to 207, have been participating in Magat watershed management initiatives. Thus, collective action is present. Through these groups, in collaboration with the LGU and the DENR, the Barobbod watershed within the Magat Watershed has been a recipient of the *Galing Pook* Award of Excellence in 1999, as one of the 10 outstanding CBFM programs in the country. The LGU has also pioneered tree planting activities in open areas—both in the uplands and in the lowlands through its "tree for legacy" program. This program has resulted in the greening of Nueva Viscaya and is a tremendous success. There are other projects spearheaded by the LGU in this watershed—and these

demonstrated the important role that 'champions' like the Provincial LGU could play in managing the country's watersheds.

Still, there are problems along the way that tend to slow down effective implementation of watershed projects in Magat. These include: a) conflict and disputes over land and water resources among various stakeholders; b) weak and unsustained support of civil societies and relevant stakeholders to some initiatives; c) limited technical capacity of the LGU to manage the watershed, and d) unclear and sometimes conflicting policies that make it difficult to implement the watershed management approach in natural resource setting.

The Manupali Watershed Experience

As described in the case study report of Rola, Sumbalan and Suminguit (2004), the Manupali watershed forms part of a bigger watershed- the Upper Pulangi Watershed, with headwaters emanating from the Mt. Kitanglad Range Nature Park (MKRNP). The latter is a 40,176 hectare Protected Area Park that covers the North-Central portion of Bukidnon. The Upper Pulangi has an area of 296,153 hectares. There is yet no clear linkage between the management of Manupali watershed and the bigger Upper Pulangi watershed. Seven of the fourteen barangays in Lantapan are under the management jurisdiction of the MKRNP. Lantapan LGU works closely with the Protected Area Management Board (PAMB) of the MKRNP in the management of these upland areas (termed the buffer zone) now used for intensive agriculture. In addition to the PAMB, which is the governing body for the MKRNP, and the LGU of Bukidnon, through the BWPDC, a significant portion of the area is under the control of the indigenous communities. For Lantapan, this group consists of the *Tala-andig*, headed by Datu Saway.

For Lantapan, in particular, the Municipality LGU has created the Municipal Technical Working Group for Watershed Management and Development. The composition consists of 10 members consists of LGU representatives, DENR, NGOs, and other stakeholders in the area. This group is responsible for the Comprehensive Watershed Management Plan for Lantapan. It has recently completed the drafting of a municipal watershed management plan—which focuses on the activities geared towards the management of production forest and the agricultural lands and water resources found in the area. Prior to the drafting of said plan, however, Lantapan has been recipient of many development and forest management initiatives on account of the important role that their area plays in the whole Manupali watershed. The major players have been the DENR, Department of Agriculture, LGUs, NGOs, POs and even the banana

plantation companies found in the area. The watershed management efforts included: a) agro-forestry program for small-scale farmers, b) protection of river banks through bamboo planting, c) and various IEC initiatives to make people aware of the importance of the watershed. The area has also been the project site of the SANREM project—which provided training on some aspects of watershed management and water quality assessment, along with community organizing efforts to enhance awareness on the need to manage the natural resources using the landscape-lifescape approach that is consistent with watershed management approach. The World Agro-forestry Center (also known as ICRAF) has also several demonstration sites on soil conservation practices. Lantapan has yet to activate the Lantapan Watershed Management Council, a policy-making body that will oversee the various management activities. The presence of the municipal environment and natural resources office (MENRO) could greatly facilitate the coordination of these upper Manupali watershed activities. But, MENRO is an optional provision according to the LGC, and poor upland municipalities like Lantapan cannot afford this office for the moment.

The budgetary requirement of the Lantapan Watershed Management Plan is estimated to be PhP4.7 million annually—part of which could come from the provincial LGU's PhP 14.97 million appropriations for the watershed management in year 2004.

The Mt. Kitanglad Range Natural Park (MKRNP), on the other hand, was one of the 10 protected areas that received funding from the World Bank-GEF through the Conservation of Priority Protected Areas Project (CPPAP). The funding lasted for seven years, starting in 1994. The project infused PhP6.9 million for the creation of non-destructive livelihood activities and PhP12 million for production-related activities. After the life of the CPPAP, the LGU has allocated PhP2.6 million in 2002 for watershed management activities. In 2004, the Protected Area Management Board (PAMB) has launched a fund-raising campaign and has obtained PhP48 million worth of commitment from the private companies over the next 20 years. Whether this amount is sufficient is yet to be determined but kind of commitment happens along the line of environmental service payments scheme. How to make this amount available to those providing watershed protection and how to make other water users pay remains a challenge as well.

In terms of intellectual capital—the CPPAP has provided the PAMB with the opportunities to exercise their management skills. The project also resulted in the creation of the Protected Area Superintendent (PASu) office which directly supervised the day-to-day management of the

protected area—this is currently headed by an experienced forester. At the Lantapan municipality—a staff of PENRO is assigned to deal with natural resource management issues in the area. The fact that this job is a temporary assignment made it difficult for the person to perform with utmost efficiency. Still, it is a major limitation that Lantapan has no municipal environmental office, which is something really needed in the area, as earlier mentioned.

The Bukidnon Watershed Provincial Development Council (BWPDC) provides training opportunities for the different technical working groups who are engaged in watershed management efforts. So far, these working groups have received training on watershed management, resource management appraisal, resource management analysis, technical writing, and others. The presence of the Central Mindanao University, through its College of Forestry, has also facilitated the transfer of technical skills to those directly involved in watershed management.

There exist several national and local laws that affect the Manupali watershed (see Rola, Sumbalan, and Suminguit, 2004). These laws provide the sound basis for protecting the environment and define appropriate land uses and recommended practices for the protection of the watershed. The laws on said topic are not wanting—as far as watershed management is concerned. At the national level, the link of the watershed to water resources needs further clarification, however, since watershed concern falls under different agencies while water resource concerns, to another.

While it would seem that there are financial capital made available to the area for watershed management efforts and more committed to it in the years to come—these may not be adequate and efforts to link payments to provision of environmental services still need to be worked out. Proper pricing of water to reflect watershed function service of the forest needs to be implemented. Also, the intellectual capital for Lantapan is very much wanting since there is no designated municipal environment officer. This is necessary in the strengthening of the management structure at the municipal level. Because agriculture is the main land use in the upper reaches of the Manupali, there is a need to have more training on sustainable agricultural practices of the municipal staff.

The Maasin Watershed Experience

The question on whether the natural resource management is being governed by the ecological unit-defined by the watershed seems to be a

non-issue in this particular case—as the watershed-water linkage has clearly been established in the early 1990s when the water crisis was felt in Iloilo City (Francisco and Salas, 2004). The ensuing information, education, and communication (IEC) campaigns undertaken by the Metro Ilo-ilo Water District and the *Kahublagan Sang Panimalay* Foundation promoted the 'think watershed' theme and is something that is still being continuously promoted by Kahublagan, even at the present time. It seems safe to assume that there is a high level of acceptance of the watershed-based management approach in the Maasin Watershed and the bigger Tigum-Aganan watershed, under which Maasin forms the upland portion.

The 1991 Local Government Code (LGC) or Republic Act (RA) 7160 provides the legal basis for local governance of the country's natural resources—including its watershed. Supported by this legislation, the Iloilo Watershed Management Council (IWMC), a multi-sectoral local body created by the Iloilo provincial local government was created through an ordinance to put into action the provisions of the LGC. The council is responsible for the conservation, development, protection, and utilization of the 15 watersheds in the Province of Iloilo. To carry out this task, the IWMC is empowered to form watershed boards for each specific watersheds or cluster of watersheds. To date, three watershed boards are already created (Tigum Aganan Watershed Management Board; Magapa-Suage Watershed Management Council; and Sibalom Watershed Management Board) with a fourth, coming up soon—Barotac Nuevo River watershed council.

It is also important to note that the Watershed Management Plan is already integrated in the municipality's Annual Investment Plan and Annual Development Plan. This link ensures that the plans for the watersheds now become part of the regular programs of the municipalities that comprise the watershed.

From all indications therefore, one could only conclude that there is a full acceptance among the local government units at all levels that their natural resources should be managed with the watershed as the relevant ecological unit. This was manifested in the creation of the watershed management council and the various watershed boards who are responsible in putting into action this approach of natural resource management.

The watershed communities can be divided into two broad groups: upland communities and lowland communities. The former are either living within the watershed or/or cultivating farms therein and/or collecting forest resources found within the forested portion of the

watershed. The lowland communities are those whose stake to the watershed comes in the form of the environmental services, e.g. water supply and ecological functions, derived there from.

The water crisis experienced in Iloilo City in the early 1990s has made possible the high level of awareness among the lowland communities on the importance of protecting the watersheds to support their water supply. They have felt the problem and have responded by participating in various tasks undertaken in watershed management efforts in the watershed in the early 1990s. The social capital that was formed in those early efforts to protect the watershed was harnessed through the continuing IEC program carried out by Kahublagan Sang Panimalay Foundation. The high level of social capital translates more concretely to the formation of some ---Barangay Information Centers (BICs), which are the front runners in implementing various programs in support of watershed management.

What about the upland communities? The funding provided by the Forestry Sector Project for the rehabilitation of the Maasin watershed included a 2-year funding for community organizing (CO) efforts. The efforts included building capacity to undertake cooperative endeavors, harnessing inter-personal relationship among the members, and provision of managerial and technical skills to undertake reforestation activities and management of the field-level activities. The results are the formation of several people's organizations in the various upland communities surrounding the Maasin watershed and their coalition into the KAPAWA. Overall, therefore, one can say there are strong social capital and intellectual capital that have already been put up for the Maasin Watershed—and these capitals can be tapped to spread the efforts of watershed management to the bigger Tigum-Aganan watershed.

The building up of social and intellectual capital, and to some extent the supporting institutional structures for watershed management was made possible by the infusion of large financial resources that were made available for the management of Maasin Watershed. The major source of funds was the DENR Forestry Project funded by the OECF and the ADB. Around PhP50 million of project funds were expended for site development activities in Maasin and the supporting Community Organizing Efforts. The Local Government, the NGO, the Metro Iloilo water district, other government agencies like the Regional Development Council chaired by NEDA, and various groups of civil societies have all contributed in the effort to reforest the degraded portion of the watershed.

What have the various watershed management initiatives achieved by the end of all these massive cash infusion? An investigation of the change in vegetative cover in the area seems to indicate substantial progress in land rehabilitation efforts. The fact that social capital has been enhanced and the intellectual capital of the upland communities have improved—also tend to indicate success of the project. However, there are indications or early signs that the gains achieved from the various watershed management initiatives could not be sustained if no serious efforts to protect the area will be made. In particular, the communities who were involved in site development activities and forest protection are no longer receiving income from the DENR-OECF forestry project. The project has lapsed and so is the funding. While training for livelihood activities were provided and some livelihood projects were put up—very few are involved in these projects. The limited employment opportunities in the area do not help improve the situation. Without other source of income—it is not surprising that the upland communities who were tapped to undertake the site development activities will be tempted to tap on the forest resources for additional source of income. Surely, serious efforts to protect the gains from past investments through continuing watershed protection are the main challenge confronting the Maasin Watershed. To address this problem—the provision of service payments to community members who will undertake watershed protection seems the only logical step. In the same vein, the beneficiaries of watershed protection efforts—particularly, the water consumers—households, industries, and agriculture, should be made to pay for the watershed services that watershed protection produce. When beneficiaries are made to realize that continuous provision of high quality water at the desired quantity—has a cost and is of value to them—then, environment payment scheme is a natural thing to do.

The Experiences with Community-led Watershed-Based Water Resources Management in Balian, Pangil, Laguna

The Balian Forest Reserve has the smallest land area, of the four case study watershed areas. Interestingly, however, it is probably the area which has the oldest history in managing watershed for the water resources it provides. The study by Contreras (2004) pointed out that as early as 1925, the community members of Balian have formed themselves into the *Samahan ng Balian para sa Pagpapauwi ng Tubig, Inc.* (SBPTI). The goal of this association is the management of the water system that is sourced from a spring within a small watershed in the Sierra Madre Range. The authority to manage the water system was secured from the Municipal council of Pangil.

The major threat to the watershed managed by SBPTI happened in the 1960-1970 period caused by the entry of commercial logging operations in the area. As a consequence of the alteration in forest cover, the people have begun experiencing a reduction in water supply in the 1980s. This event has triggered various watershed protection efforts, with the assistance provided by an NGO—known as the Southern Tagalog Regional Action Program (STRAP). Among the first efforts in this area is the declaration of the 50-meter radius buffer zone in all water sources—which was subsequently expanded to 100 meters, through a municipal ordinance. A review of the experiences of the SBPTI indicates that the community has always been supported by legal mandates in carrying watershed protection activities.

However, the passage of the local government code—has armed the Local Barangay Council (LBC) to take over control of the waterworks system of Balian. The LBC must have meant well as it attempted to improve the waterworks system through JICA funding but this failed due to non-compliance with project designs. What the LBC failed to achieve, the SBPTI rectified immediately when it demonstrated that it could undertake the improvement in waterworks through contributions and volunteerism of its members. Indeed, this action demonstrated the strong social capital in the SBPTI and its commitment to protect the source of its waters. The relationship of SBPTI and LBC remains problematic on this matter.

It is worth mentioning that SBPTI is joined by other groups—local fisher folks, upland farmers, STRAP, and GOs like DENR and DA in its efforts to carry out reforestation and protection activities in the 100-meter buffer zone of all springs in the area. The NGO-STRAP was instrumental in providing technical training on forest and watershed management aspects. In fact, it has helped in the formation of the *Lingap Kalikasan*—a multi-sectoral group based in the community which takes care of IEC efforts on watershed management concerns. This group was also provided training on technical aspects by STRAP—and has been quite active in watershed protection activities.

In contrast to the bigger watershed areas—the funding of watershed management activities is being generated mainly from contributions of members and volunteerism in project implementation. Social capital is high. Technical assistance, however, came from STRAP and some government organizations like DENR and DA. While one can easily point out that the volunteerism and contributions could only provide sufficient funding since the area being protected is quite small—the fact that these farmers are among the marginalized sector of society points to

their strong commitment to protect the ecosystem that supports their water supply. Creating that high level of commitment is made easy by the fact that the people have a very clear appreciation of the linkage between watershed protection and sustained water supply. Sending this message out to everyone within the watershed area is one important lesson that we can learn from this particular case study.

Synthesis: Lessons Learned on Watershed Management Implementation

The four case studies of varying scale (from the river basin represented by Magat to the smallest forest reserve in Balian, Pangil) interestingly validated the watershed management framework advanced in chapter 1 of the book entitled: “Winning the Water Wars: ...” . Specifically, the case studies have shown that the implementation of watershed management requires some level of financial capital, a community or group of communities with good enough level of intellectual and social capitals, and where the legal and institutional framework to support the watershed approach is present. The level of these various forms of capital varies across watershed—which leads to varying level of watershed management implementation as well.

A key factor that needs to be emphasized is the critical role of understanding the link between watershed protection and water supply services by the watershed populace. This link is most appreciated by watershed populace in the case of Balian, Pangil forest reserve and in the Maasin Watershed. The fact that the people of Balian are keenly aware that their water comes from springs sustained by well protected forest area has been important in mobilizing community efforts to protect the watershed. The water shortage problem in the 1980s all the more makes this ‘link’ visible to everyone. In the Maasin watershed, the water supply problem experienced by Ilo-ilo city residents had made many people aware that they need to protect their watershed. The ‘think watershed’ mentality was emphasized regularly in the long years of IEC in this watershed. In the case of the Manupali headwaters, the MKRNP, funds raised from the private sector for its protection, was a result of the advocacy that water-based economic activities in the lowlands can only be sustained through good watershed management, i.e. the protection of its headwaters.

Quite clearly—when people are aware of what the watershed does for their water supply—then, they know that it will be in their interest to participate in watershed protection. This message needs to be sent out

clearly and continuously through Information, education, and communication (IEC) efforts—as demonstrated in almost all the watershed cases.

The IEC efforts usually depend on the presence of effective NGO in the area—like Kahublagan in Maasin and STRAP in Balian. In some cases, the LGU themselves were quite active in IEC (and provision of technical training) like the Provincial LGU in Nueva Viscaya and in Bukidnon. To some extent, the water district or private sector could play role as was done by the Metro Iloilo Water District in the early 1990s—when the problem with water supply was first experiences. Even for a small watershed like Balian—the NGO has played an important role, though not really in the 'link' awareness campaign—but in the provision of technical skills on how rural communities can protect their watersheds.

The important roles of a well-formed community of people who are working together and actively participating in watershed activities is also demonstrated in almost all the study sites—though in varying degrees. In the Balian case for instance—the people are the prime mover of watershed protection. In the Lantapan watershed—the people are actively involved, pushed largely by LGU support and mobilization initiatives. The LGU in Magat has also mobilized the community but in both cases, more efforts need to be made. The community support in Maasin watershed has been institutionalized through the formation of various barangay information centers. There is a high level of social capital that can be mobilized to support watershed management efforts.

Clearly—the studies have shown that financial capital has an important role to play in building up all the other forms of capital. One can see for instance that Maasin watershed would rate very high in all the important elements or forms of capital needed for watershed management—but this was because it received so much funding to carry out IEC, Community organizing efforts, training, and even site development activities. The Barobbod watershed in Magat watershed is also a recipient of DENR-Forestry Sector Project funding, as well as the headwater of Manupali watershed in MKRNP. While this is true—the commitment by the various interest groups like the provincial LGU and now, the various local LGUs, the NGO, and the various agencies in the area and the private sector as well—is not something that could be bought by money—many of these agents have expended their own resources to bring about better watershed services? for its populace. Of course, an exemption to the importance of financial capital may be seen in the case of Balian forest reserve, which did not receive any external funding for site development efforts-- and yet was still able to achieve its

goal of protecting the buffer zone of water system. However, one could be quick to point out that in this instance, scale matters—Balian having only 31-hectare watershed—may be quite manageable compared to the other watersheds.

This paper would argue that indeed financial capital is very important in undertaking watershed management activities. Two things need to be remembered: First, watershed protection efforts cost money and whoever provides these tasks needs to be appropriately compensated. Second, watershed protection has value. The sustained flow of high quality water that feeds the household water requirements, fuels the industries and power sector, and irrigates farmlands in downstream communities—all are proofs that watershed protection is a valuable activity. As such, those who benefits from this service must be willing to pay for the service to obtain the water that they need. These arguments are the basic principles behind the 'environmental service payments' advocacy. If one agrees on these points—then, efforts must be forwarded relentlessly in order to obtain 'payments' that can support watershed protection efforts.

The case studies have shown that past efforts to protect the watershed have relied extensively on assistance provided through some national forest protection programs and other community-based livelihood activities and reforestation projects. All these programs have definite time table—the watershed efforts last only as long as the program lasts. The results are short-lived watershed management initiatives. Efforts to sustain the protection of the watershed and thus to sustain the flow of water services need to be explored. On this end—the principle of environmental service payments as mentioned earlier must be explored for implementation in the various watersheds of the country. They could potentially address the lack of sustained efforts on watershed protection experienced in many watersheds of the country.

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