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Realities of the Watershed Management Approach: The Manupali Watershed Experience

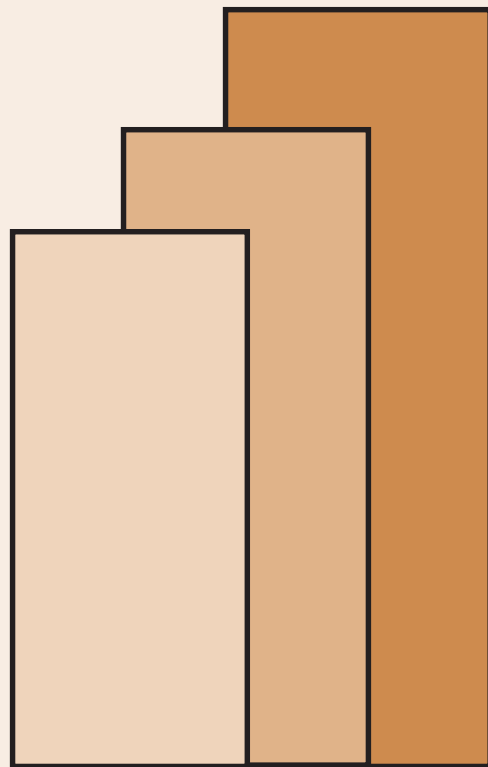
Agnes C. Rola, Antonio T. Sumbalan and Vel. J. Suminguit

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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
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**Realities of the Watershed Management Approach: The Manupali
Watershed Experience
(Final Report)**

Agnes C. Rola, Antonio T. Sumbalan and Vel J. Suminguit

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Abstract

Local research in the Manupali watershed, with about 60% of its land area belonging to the upland municipality of Lantapan, Bukidnon, found that water quantity and quality declined due to soil erosion and domestic waste contamination. As population grows and agriculture becomes more integrated to the market, water deterioration is projected to worsen. Both economic and environmental sustainability then depend on the following management bodies: 1) the management of the Mt. Kitanglad range, the headwaters of the Manupali, 2) management of the tributaries that are within the agricultural areas of Lantapan and 3) the management of the bigger watershed cluster to where Manupali belongs.

The first two management entities have management plans in place; with some funding pledges for the Mt. Kitanglad Range Natural Park (a protected area by law) Management Plan. The Lantapan municipality watershed management plan still needs funding support and an institutional body that can implement said plans. The bigger watershed cluster plan (Upper Pulangi) is being developed and success in the management depends in part on the commitment of the several communities that compose this cluster.

Some of the challenges that were identified in implementing the several watershed management plans charged with sustainability of the Manupali are financial sustainability, limited economic instruments, weak property rights, lack of administrative mechanisms, human capital and institutional constraints, and a legal basis for the management structure.

Keywords: watershed management, upland economic growth, watershed management plan, economic sustainability, environmental sustainability

Realities of the Watershed Management Approach: The Manupali Watershed Experience¹

(Final Report)

Agnes C. Rola², Antonio T. Sumbalan³ and Vel J. Suminguit⁴

I. Introduction

The Manupali Watershed in Bukidnon traverses the upper part of the Pulangi River Basin. Several tributaries of Manupali are located in the municipality of Lantapan, Bukidnon. In turn, all of Lantapan is located inside the Manupali watershed. The rivers, including the headwaters of Manupali emanate from the Mt. Kitanglad Range. The Manupali River is also an important water source that drains into the Pulangi River, a source of irrigation and electric hydropower in Bukidnon.

Why is there an urgent need to manage the Manupali watershed and watersheds of similar nature? Because of the economic growth in the town of Lantapan, competing use of water is inevitable. Small hold agriculture especially in the upper watershed has thrived with abundant water supply from streams and rivers. With the establishment of the rural water supply to cater to rural households especially in the more urbanized centers, there is a demand for clean and safe drinking water. The plantations and the commercial livestock operations recently established in the town are the other water consumers in the area. But recent studies revealed a rapid rate of degradation of the tributaries of the Manupali River. The supply of clean water in Lantapan is dwindling (Deutsch et al. 2001). This is caused by several factors. First, soil erosion is a result of intensive cultivation without soil conservation measures in the steep slopes. Downstream in the city of Valencia, cost of dredging of the Manupali River Irrigation System has significantly increased due to this increasing volume of sedimentation (MSEC, 2002). Second, the bacteriological contamination in the river water, a significant water source especially of the poor households, is also observed. Third, dramatic differences in stream discharge patterns were found in several rivers in the town probably because the “sub-watershed is mostly cleared of forests and has relatively little infiltration of rainfall to ground water” (Deustch and Orprecio 2004).

Among others, this seeming disconnection between increasing demand and declining supply of water is the rationale for the urgent need to manage the Manupali watershed. Management of the Manupali Watershed, is dependent on: 1) the management

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² Professor, Institute of Strategic Planning and Policy Studies, University of the Philippines Los Banos

³ Consultant, Protected Area Management Board (PAMB) of the Mt. Kitanglad Range Natural Park and Consultant, Office of the Governor, Province of Bukidnon

⁴ Member, Technical Advisory Committee, Bukidnon Watershed Protection and Development Council, and Site Coordinator, SANREM-CRSP SEA.

of the Mt. Kitanglad Range, the headwaters of the Manupali; 2) management of the tributaries of the Manupali watershed (Alanib, Kulasihan, Tugasan, Maagnao) that are within the jurisdiction of the Municipality of Lantapan, Bukidnon, and 3) the management of the watershed cluster (Upper Pulangi) to where the Manupali belongs.

So far, the Mt. Kitanglad Range Natural Park management, coordinated by the Protected Area Management Board (PAMB) has implemented the plan for protected area and production forests. The Lantapan municipal watershed management plan that will manage mostly the alienable and disposable lands and those of private agricultural lands, (coordinated by the local government unit) was approved by the Sanggunian Bayan (SB) last September 2003. The cluster (a group of municipalities sharing a watershed) management plan is in development stage for the seven watershed clusters that compose the province⁵, including the Upper Pulangui cluster, which wholly contain the Manupali.

This paper will describe the current management strategies in the Manupali watershed aimed for both the economic and environmental sustainability. In Section II, we describe the watershed in terms of the hydrology, as well as its biophysical and socio economic characteristics. The third section is a discussion of the current management activities. We will investigate the realities of watershed management at various perspectives: financial, technical, social/institutional, and political/legal. A discussion of the challenges in the implementation of the said plans is in Section IV. A brief conclusion and some recommendations will be discussed in Section V.

II. Description of the Manupali Watershed

A. The Hydrology of the Manupali Watershed

The Manupali River and four of its major tributaries have as their headwaters the Mt. Kitanglad Range Natural Park or the MKRNP⁶ (subsequently referred to as the Park). The Park encompasses 40, 176 hectares covering the North-Central portion of Bukidnon. Seven municipalities and one city of the province share the boundaries at the summit. The range is headwater source of several major river systems draining North and Central Mindanao. Its creeks and rivers flow in a radial pattern and feed the Cagayan, Tagoloan and Pulangi Rivers.

⁵ There are six watersheds in Bukidnon but for management purposes, Department of Environment and Natural Resources (DENR) and Bukidnon Environment and Natural Resources Office (BENRO), a local government agency divided Pulangui watershed into Lower Pulangui and Upper Pulangui watershed, hence there are seven watershed clusters.

⁶ The range has an undulating landscape, with more than a dozen peaks. Some of these are among the highest in the Philippines. Mt. Dulang- dulang, which has an elevation of 2,938 meters above sea level (masl), is the second highest peak in the country. Mt. Kitanglad peak follows closely with an elevation of 2,899 masl.

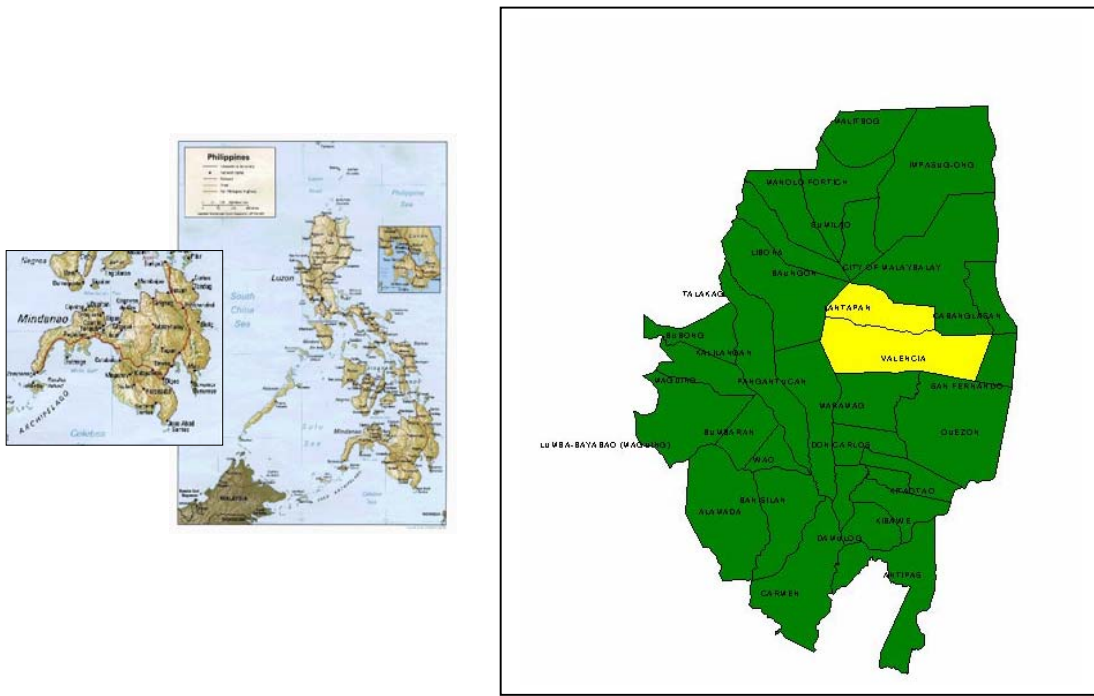


Fig. 1. Location Map of the Manupali watershed

Pulangui River originates from the mountainous portion of the Municipality of Impasug-ong. It flows in the southwesterly direction traversing Central Bukidnon and Cotabato province and empties into Illana Bay. For management purposes, Pulangui is divided into two: upper and lower. Upper Pulangui, where Manupali river is contained, has a total area of 296, 153 hectares (Table 1) with an estimated annual discharge of about 16,399 mcm. It is one of the seven watershed clusters in Bukidnon⁷ and Lantapan is wholly contained in this cluster.

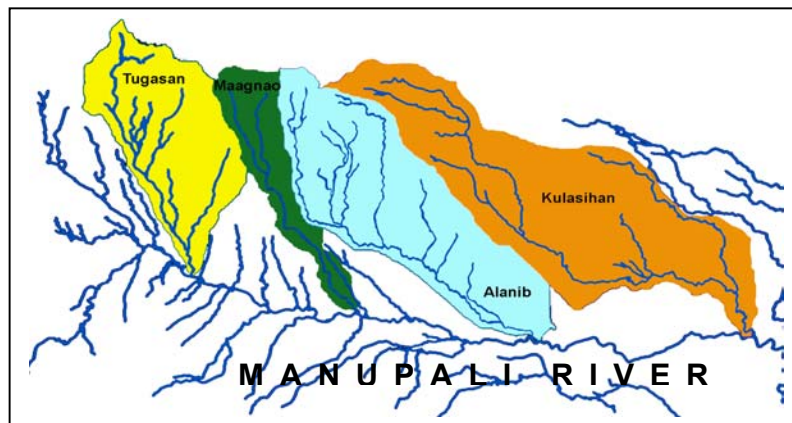


Fig. 2. The four main tributaries of the Manupali River in Lantapan, Bukidnon, Philippines

⁷ At the province level, Bukidnon contains the headwaters of six major rivers in the Mindanao isaland: Tagoloan, Cagayan, Agusan-Cugman, Davao-Salug, Pulangui (Upper and Lower) and Maridugao Rivers. Discharge from these river systems drain into 3 cities (Butuan City, Davao City and Cagayan de Oro City) and 5 provinces (Agusan del Sur, Davao del Norte, North Cotabato, Lanao del Sur and Misamis Oriental).

Table 1. Bukidnon watershed clusters and municipalities/cities covered.

| Cluster | Area in hectares | Municipalities/Cities covered |
|----------------|------------------|--|
| Upper Pulangui | 296,153.17 | Malitbog, Impasug-ong, Malaybalay City, Cabanglasan, Lantapan, Valencia City, San Fernando, Maramag and Quezon |
| Lower Pulangui | 154,956.34 | Maramag, Quezon, Pangantucan, Kadingilan, Don Carlos, Kitaotao, Dangcagan, Damulog and Kibawe |
| Tagoloan | 151,870.84 | Malitbog, Manolo, Fortich, Sumilao, Impasug-ong and Malaybalay City |
| Cagayan | 110,631.06 | Talakag, Baungon and Libona |
| Maridugao | 57,362.27 | Don Carlos, Pangantucan, Kalilangan, Kadingilan and Talakag |
| Davao-Salug | 36,445.31 | San Fernando, Quezon |
| Agusan-Cugman | 21,959.01 | Libona and Manolo Fortich |

Source: Egnar, 2003.

The Manupali River forms the southern boundary of the municipality of Lantapan and the northern boundary of the municipality of Valencia and has tributaries originating in both of these municipalities (Figure 1). The Manupali watershed contains 220 streams traversing a total of 636,000 meters and draining approximately 40,000 hectares (FORI, 1982 as cited in Bellows et.al. 1995). Lantapan covers about 60% of the watershed area. The different sub-watersheds in Lantapan are listed in Table2 and listed in Figure 2. The remaining 40% of the Manupali watershed is in Valencia.

The Manupali River is a tributary of the Pulangui River, which flows into the Pulangui IV Reservoir. The Pulangui IV Reservoir is one of the six reservoirs developed by the National Power Corporation (NPC) for the generation of hydroelectric power. It also supplies water to the Manupali Irrigation System which has a service area of 4,395 hectares in 2003.

Table 2. Total area and barangays covered, by sub-watersheds, Lantapan, Bukidnon, Philippines.

| Name of Sub-watershed | Total Area (ha) | Barangays covered |
|-----------------------|-----------------|---|
| Timago* | 2,451 | Basak |
| Kinusuhan | 750 | Basak |
| Tugasan* | 5,067 | Basak, Kibangay |
| Cawayan/Kimanga | 2,398 | Kibangay, Victory, Cawayan |
| Maagnao* | 3,595 | Kibangay, Victory, Songco, Baclayaon, Cawayan, Balila, Alanib |
| Alanib* | 7,110 | Songco, Alanib, Kaatuan, Baclayon, Poblacion, Balila |
| Kulasihan* | 13,274 | Alanib, Baclayon, Poblacion, Bugcaon, Kaatuan, Bantuanon, Capt. Juan, Kulasihan |
| Cabangahan | 820 | Bugcaon, Capitan Juan |

* Tributary to the Manupali River

Source: Lantapan Municipal Watershed Management Plan, 2002

B. Other Biophysical Characteristics of the Manupali Watershed

Slope and Elevation

Elevation of the Manupali watershed ranges from 320 masl (meters above mean sea level) at Bugcaon to 2,938 masl at the summit of Mt. Kitanglad peak. The mean elevation for the watershed is 1,561 m. The slope of the watershed ranges from slight to moderately rolling terrain and hills. About 70% of the area has slopes greater than 10% (Figure 3).

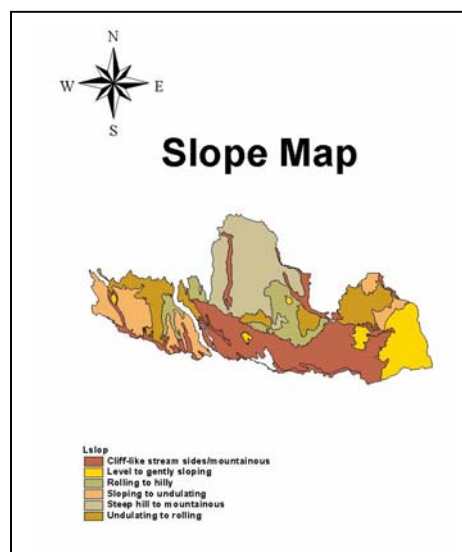


Fig. 3. Slope map of Lantapan

Climate

The climate in the upper reaches of the Manupali is characterized as having a short dry season lasting only from one to three months with no pronounced maximum rain period. The area is virtually cloud covered throughout the year. Temperature ranges from 22.7 °C during January to 24.6 °C in June. The area receives the highest amount of rainfall in June; March is the driest month. The climate in the lower portion of the watershed is characterized by high Relative humidity (RH). Rainy season generally starts within the month of May and lasts up to October. The average monthly rainfall is 224.54mm. In high altitude areas, higher rainfall is practically during dry months (LWMC, 2002).

Soils and Land Use

Bukidnon's soils are generally of medium fertility. The most pressing soil fertility problem is high soil acidity, a result of the erosion of surface soils and oxidation of organic matter following deforestation and regular cultivation. Except for the alluvial soils of the valley floors and those derived from limestone which are slightly acidic to neutral, practically all the uplands soils are moderately to very strongly acidic. In the more eroded areas this combination of low pH and low organic matter is frequently exhibited as soils of relatively low fertility, most often deficient in available phosphorus (and to a lesser extent potassium).

In Lantapan, the volcanic soil belonging to the *Adtuyon* and *Kidapawan* clay are highly suitable for agriculture. Fifty-four percent of the total land area is devoted to agriculture. The remaining area is forestal, built-up and open spaces. Land use pattern has not significantly changed for the past 8 years (Table 3). At the province level, the 2002 land classification shows that 321,576 hectares or 38.77% are classified as alienable and disposable while 507,802 hectares or 61.23% still remain as forestlands (Table 4). The vegetative cover of the forestland reveal that only 227,062 hectares are forested while the remaining 280,740 hectares are brush lands and open or cultivated areas.

Table 3. Land use pattern, Lantapan, Bukidnon, 1994 and 2002.

| Classification | 1994 (%) | 2002 (%) |
|---|-------------|-------------|
| Agricultural | 53 | 54 |
| Forestal (Pasture, Grassland and Forest Lands) | 41 | 37 |
| Built-up Areas (Commercial, Residential, Agro-Industrial) | 6 | 6 |
| Others | - | 3 |
| Total | 100 | 100 |
| Total (ha) | 31,820 | 32,970.90 |

Source: MOL, 1994 and 2002.

Table 4. Land use in Bukidnon, 2002.

| Land Use | Area (ha) | % |
|--------------------------------|--------------------|----------------|
| Total Land Area | 829,378 | 100 |
| 1. Alienable and Disposable | 321,576 507,802 | 38.77 61.23 |
| 2. Forest Land | | |
| <i>Vegetative Cover</i> | 22,899 | 4.51 |
| Old growth forest | 102,369 | 20.16 |
| Residual forest | 83,640 | 16.47 |
| Mossy forest | 90,945 | 17.91 |
| Brushland | 189,795 | 37.38 |
| Open/cultivated | 18,154 | 3.58 |
| Forest Plantation | | |

Source: DENR-PENRO, Bukidnon

Of Lantapan's agricultural land area, more than half is classified as being under temporary crops (Figure 4). A small fraction of this, at the eastern boundary of the municipality, was irrigated; this area was devoted almost exclusively to rice production. The moderately sloped and rolling lower footslopes immediately to the west produced corn and sugarcane; further up the watershed sugarcane planting diminished as increasing distance and lower road quality raised the cost of travel to the Bukidnon Sugar Milling Corporation (BUSCO) in Quezon and Crystal Sugar Mill in Maramag, rendering production of this high-valued crop less profitable. In the upper footslopes that made up the largest agricultural area of the watershed, corn was the dominant crop. At middle altitudes coffee is an important secondary crop, while at higher elevations corn was planted alongside coffee and temperate climate crops: beans, tomatoes, cabbages and potatoes. Other minor agricultural enterprise included cassava, abaca, and tree plantations

for firewood, livestock and non-timber forest products. Because of the intensive cultivation of annual crops, soil erosion is highly evident in relatively steep shoulder and side waterways. Because of the steep slopes, soil erosion may range from moderate to severe especially when planted with row crops. The present estimate of slight erosion in Lantapan is about 20.5%, moderate erosion, 39.36% and severe erosion, 40.14% (MOL, 2002; LWMC, 2002).

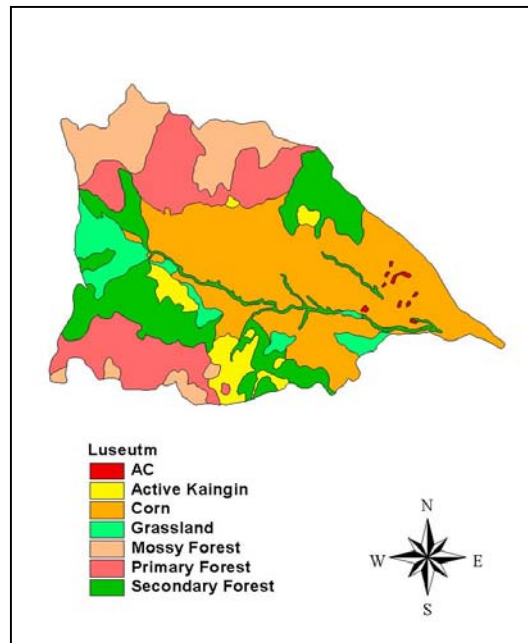


Fig. 4. Spatial distribution of land use/land cover in the Manupali watershed

Land in the Manupali watershed is legally divided between alienable and disposable lands in the lower elevations and forestlands at the upper elevations (Bellows et. al. 1995). Alienable and disposable lands can be titled and are subject to land reform regulations. Forest lands cannot be legally titled but ancestral residents can be granted land-use rights under the Integrated Social Forestry Program (ISFP). The area of the watershed belonging to the Mt. Kitanglad Range Natural Park (in conjunction with the NIPAS program) is owned by the state. Residency within the park boundaries is illegal⁸(IPAS 1992 as cited in Bellows et.al. 1995), except in the designated park buffer zone, which is considered multiple use zone.

⁸ As of the latest census of households by a research group in the protected area, there were 451 households who are actual occupants in the buffer zone (Canoy and Suminguit, 2001). The total occupants are 2512 members.

Water Resources

Table 2 above describes the various river systems in Lantapan. Actual data of water quantity in the watershed is not available. But a study⁹ of the four sub-watersheds draining to the Manupali gives one a glimpse of the state of the water resources in the area. The sub-watersheds differ in terms of forest cover, population and agricultural land use, and these measures are correlated with measures of water quality and stream flow. Indicators for the monitoring included total suspended solids (TSS) measures, bacterial concentrations, and stream flow and discharge measurements.

Results show that both water quality and quantity are degrading through time (Deutsch and Oprecio, 2004). The amount of TSS, as an indication of soil in runoff water to streams, progressively increased moving west to east across the four sub-watersheds. The two western sub-watersheds (Tugasan and Maagnao) had considerably more forest cover and lower human population density than the two eastern sub-watersheds (Alanib and Kulasihan). Results reveal that soil erosion from areas including agricultural land, clear cuts, construction sites and stream banks was greater in the more developed portions of the Manupali watershed.

During the droughts, runoff to the Kulasihan River was significantly reduced and erosion would, therefore, also be reduced. The increased average TSS in the Tugasan and Maagnao Rivers over the longer sampling period may indicate degradation of these sub-watersheds from increasing human population and land clearing.

Dramatic differences in stream discharge patterns were also found. The Maagnao River had relatively stable flow, even during severe droughts, ranging from about one to three cubic meters per second. In contrast, the Kulasihan River was very unstable in its discharge, ranging from zero to 10 cubic meters per second. The discharge of the Kulasihan River was largely influenced by rainfall events.

Findings about the water resources degradation in the Lantapan municipality triggered the need for a management plan for the whole watershed. This is coupled with the increasing water demand from non-traditional clients. In 1999, two banana plantations established operations in Lantapan. Eleven commercial poultry and piggery enterprises are present in the municipality as of 2001. All these operations demand a great deal of water. For instance, the average water requirement for banana plantation is 45 m³ per ha per day. If there will be 500 ha of banana farms to be irrigated, then the banana plants alone would consume 22,500 m³ per day (Tabien, 2000).

Biodiversity Resources

Mt. Kitanglad Range Natural Park – one of the famous landmarks in the province of Bukidnon has a bountiful flora and fauna population. The existing 106 families in 512 genera and 996 species characterize the biodiversity of the Bukidnon flora, and can be

⁹ The four subwatersheds, namely Tugasan, Maagnao, Alanib and Kulasihan were the sites of a monitoring study of the SANREM CRSP SEA team from 1994-2002.

found in the various forest types in Bukidnon (Lacandula, 2000). Some of the Flora found in the range are the following: Molave/Narra, Dita, Balite, Yakal, Bagtikan, Malapapaya, Almon, Bamboo, Tangisang Bayawak, Red Lauan, White Lauan, Abaca, Bamboo Tinik, Cogon, African Tulip, Rattan, Bugawak, Almaciga, Igem, Kaatuan Bangkal and Nito.

It is also a haven for 16 species of endemic birds in Mindanao and 131 species of butterflies with 114 (87%) species endemic to the area. Sixty-three (63) mammal species exist in the area, 27% of which are endemic. The famous endangered Philippine eagle can also be found nestling in the area (Lacandula, 2000). Other Fauna species found in the area are the Long-tailed Macaque, Philippine Warty Pig, Philippine Brown Deer, Large Flying Foxes, Dugong, Philippine Eagle, Philippine Duck, Rufous Hornbill, Tropic Hornbill, Red Jungle Fowl, Pigeons and Doves, Bleeding-Heart Pigeon (Heaney, 1993; Pipoly and Madulid, 1995; NORDECO and DENR, 1999).

C. Socio-Economic Characteristics of the Manupali Watershed

*Origin of the Ethnic Groups*¹⁰

The municipality of Lantapan is originally an abode of the Bukidnon natives belonging to the Talaandig Tribe. Before the influx of the migration of other ethnic groups from other parts of the Philippines into the municipality, the Talaandigs as a tribe were observed to be semi-nomadic people. Talaandigs practice shifting cultivation or *kaingin* farming. Because of the vastness of the area compared to the very limited population, they transfer from one place to another, subsisting on the resources within their environment. Talaandigs usually have their “tulogan,” a settlement where they built their relatively permanent dwellings, to which they return home at the end of the day. They also have temporary shelters by their farms. When they shifted their fields (that is why *kaingin* farming is translated in the established literature as “shifting cultivation”), they build a new temporary shelter next to the farm, abandoning the previous one. “The transfer from one place to another” is unlike the hunting and gathering society that moves very often. In the case of the shifting cultivators like the Talaandigs, the farming activities transfer to a new plot every one or two cropping seasons when fertility of the clearing is relatively exhausted. But again the new plots, as much as possible have to be relatively close to the tulogan, the relatively permanent settlement. They clear small patches of land usually situated along borders of forested areas for their staple food like rice, corn and other crops, intended basically for food consumption. To augment their food crops they hunt wild pigs, deer and other fauna during certain months of the year. Hunting and gathering is supplementary source of subsistence; horticulture is their main source of caloric intake. Among the people living along big rivers, fishing was occasionally their source of living. They usually follow fishing seasons during the year. Because of conflicts with the neighboring tribes, the natives learned to live in communities. The Talaandig community was usually fenced with tall bamboos and timber. Houses were also built on top of tall trees.

¹⁰This section is a summarized version of work written by Suminguit, Burton and Canoy, 2002; and Paunlagui and Suminguit, 2001.

That was their system of living before the arrival of the “dumagats”¹¹ to Lantapan. When these early migrants came they noticed wide tracks of open land left untilled and communities were located at the edge of vast forestland or in the middle of a thick forested area. The early “dumagats” spread the news of the promise land at Lantapan resulting to the influx of migration from early 1950’s to about the 1960s. This was also the time when the national government had a program (i.e. the NARRA) that encouraged people to settle in Mindanao in general.

Due to differences in worldview with regards to land ownership, most of the indigenous peoples (i.e. the Talaandig), lost their clearing to the “dumagats” and in turn encroached further into the forested areas. The Talaandigs, like most indigenous peoples in the world, believe that land is NOT something to OWN but something to USE (usufructuary rights). The dumagats, who were mostly displaced landless peasants elsewhere, came with the notion of private ownership of land -- that land can be privately owned and titled. Dumagats acquired land from the Talaandigs either through friendly means or through outright landgrabbing.¹² The “dumagats”, after a number of years dominated the open area while the natives choose to settle in the forested rolling areas or buffer zone.

Big waves of migration continued until about the 1990s. As a result, Lantapan is now a melting pot of different cultures. The current ethnic groups can be identified by their spoken dialect (Canoy and Suminguit, 2001.). The Visayan (or Cebuano) speaking group comprises the majority (about 41%) of the population. The “Binukid” speaking ethnic group, the original group in the municipality, is now outnumbered by the Visayan speaking group. The Igorot speaking group from the Mountain province in the island of Luzon comprises 12% of the total population.

Population Growth in Lantapan

As a consequence of the migration brought about by the need for land by lowland dwellers and the government programs that promote such, Lantapan’s population increased during the past thirty years. In 1970 to 1990, this was observed to increase by 4% annually, much higher than the Philippine average of 2.4%(Table5). The lower watershed’s population (elevation < 1,100 masl) has increased by about 5% in 1970 to 1980, and went down to about 3% in the 1990-2000, a bit higher than the national average. In contrast, population in the upper watershed has declined sharply. In this past

¹¹ “Dumagats” is the term given to people coming from the coastal towns of Misamis Oriental, Cebu and Bohol province.

¹² Gift giving and intermarriage were friendly means of acquiring the land. After being considered a friend or an adopted member of the tribe, the dumagat was usually granted the right to use the land since sharing of resources was inherent in the Talaandig culture. Little did the Talaandig know that dumagat already applied title for the land. The not-so-friendly means was the application of land title to the fallow fields of the Talaandig without seeking permission thinking that the fallow fields were abandoned vacant lots. When the Talaandig returned to the previous fallow field, somebody already occupied it with a land title. Having only bolos or spears, while the Dumagats had shotguns, some Talaandigs chose to withdraw into the interior of the mountain.

decade, it is estimated that the population growth rate is only 0.67%. This is due to several factors according to residents: 1) the implementation of the NIPAS law; 2) the vigilance of the indigenous tribe members themselves as they claim the area as ancestral domain; 3) perception that a rebel group guards the area as well; and 4) out migration of the youth seeking other opportunities elsewhere: study, work, marriage outside the community.

Table 5. Population growth rate, by location, Lantapan, Bukidnon and Philippines, 1970-2000.

| | 1970-80 | 1980-1990 | 1990-2000 |
|------------------|---------|-----------|-----------|
| Lower watershed* | 4.95 | 4.26 | 2.62 |
| Upper watershed | 2.96 | 4.47 | 1.94 |
| Lantapan | 4.16 | 4.00 | 2.36 |
| Philippines | 2.75 | 2.35 | 2.34 |

Source of basic data: National Census and Statistics Office, various years.

*This estimate includes the middle section and the river flats of the watershed.

Income and Employment

Agriculture and agriculture- based industries are the engines of growth in Lantapan and the province of Bukidnon. In 1988, 71% of provincial employment was in agriculture, 5% in industry, and 23% in services (NSO 1990). In Lantapan, dependence on agriculture almost certainly exceeded the provincial average. Farm sizes were small by upland standards: in 1980, the modal farm size class (1-2.99 ha) contained 46% of farms, and 75% of all farms were smaller than 5 ha. Most households lived close to the poverty line; in 1988 food, fuel and clothing accounted for 59, 4, and 5% respectively of household expenditures in the municipality (NSO, 1990).

Current municipal level data showed that there is diversity in the sources of incomes (Rola et al. 2003, Rola and Coxhead, 2002), which is quite atypical of an upland community. The surge of the non-traditional sources of incomes is very recent, as far back as late 1990s. Upland households are increasingly producing commercial crops, have other sources of income, and partake of markets as consumers, especially of rice. Since commercial crops such as vegetables are intensively cultivated in the uplands, soil erosion is probably the major resource management/environmental challenge confronting the watershed¹³.

III. Managing the Manupali Watershed

A. The Watershed Management Plan

¹³At the province level, soil erosion poses a serious threat to most of the present and potential agricultural areas. Almost 110,000 ha (13%) is found to be already classified as moderately to severely eroded (Bukidnon Watershed Development Plan 2000).

Figure 5 illustrates the physical linkages in the management structures governing the Manupali watershed, as previously discussed. The actual mechanism on how these different entities can work together to manage the Manupali has still to be spelled out. Over and above these plans is the ancestral domain management plan as provided in the Indigenous People’s Rights Act (IPRA).

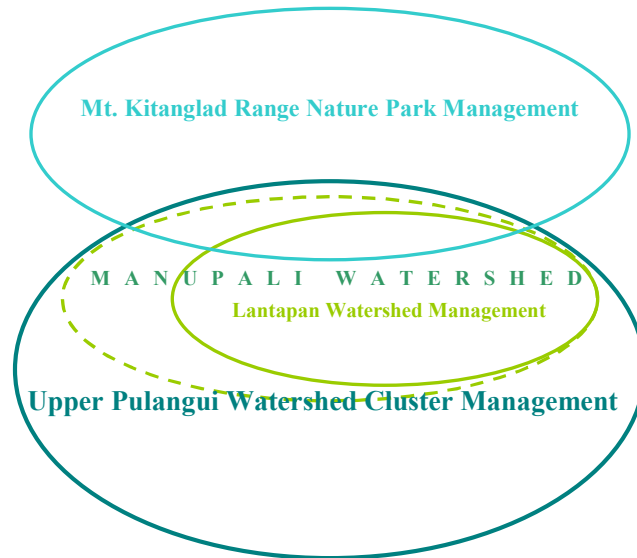


Fig. 5. Linkages of Management Entities of the Manupali Watershed

Presently, the Park’s plan in support of the National Integrated Protected Areas System (NIPAS) is operational. Lantapan has just completed drafting a municipal watershed management plan¹⁴, to guide in the management of the production forest, the agricultural lands and the water resources in its domain. The cluster management plan is still being developed.

- i) The MKRNP management plan

The management of the MKRNP institutionalizes the sustainable management regime exercised by the empowered communities (of both the IPs and the tenured migrants) who enjoy a firm tenure over the resources, and are actively involved in biodiversity conservation and protection activities, and supported by the government and a public which has internalized conservation values and respects cultural integrity.

Among its management strategies are the following:

- a. Adoption and implementation of an effective park protection, zoning, and resource management program;

¹⁴ However, even before this plan, Lantapan also came up with a Natural Resources Management Plan (NRMP) in late 1990s.

- b. Formulation of an integrated policy and livelihood support and assistance framework for the conservation, sustainable use and economic development of protected areas beneficiaries in partnership with the local communities;
- c. Ensuring biodiversity conservation awareness and information programs; and
- d. Institutionalization and strengthening of capacities for effective protected area management and supervision.

Part of the management is to ensure that water quality and quantity are maintained in the watershed. The management plan was completed in 2000. To make the plan workable and operational, several seminars and training workshops were held to orient and familiarize the local officials of the buffer zone on the implementation procedures. Seven of the 14 barangays in Lantapan are located in the buffer zone, and are thus under the jurisdiction of the MKNRP management.

ii) Lantapan watershed management plan

Even without the plan, Lantapan has been initiating projects for rehabilitation of its critically denuded watershed through the support of government agencies (DA, DENR, Barangays, Municipal Government), NGOs, POs, and two (2) banana plantation companies. Some of the activities towards watershed management in the town are: 1) information drives for local people to be aware of the natural resources in Lantapan and the need to conserve and protect its resources, 2) bamboo planting along riverbanks, and 3) agro-forestry program for the small-scale farmers. The activities did not only involve the water issue but also issues on soil, forest, biodiversity and community awareness and cooperation. The existing environmental projects in Lantapan are summarized in Appendix Table 1. The proposed development projects and the budgetary requirements are listed in Appendix Table 2.

iii) Upper Pulangui (cluster) watershed management plan

The watershed management plan of the cluster of municipalities contained in the Upper Pulangui has not been formally formed. This is the responsibility of the province-level Bukidnon Watershed Protection and Development Council (BWPDC). In 1995, BWPDC was established in “order to fully protect and preserve the remaining forests in Bukidnon Watersheds and rehabilitate open areas with their headwaters”, as per the Presidential Memorandum Order 270.

B. Financial Considerations

Financial support for the protection and development of the MKRNP management has had humble beginnings. In 1993, municipal mayors had to fund meetings from their own pockets. The park was also one of the country’s 10 sites covered under the

Conservation of Priority Protected Areas Project¹⁵ (CPPAP), a seven-year project that took off in 1994.

During the life of CPPAP, fund amounting to P6.9 million were provided to the indigenous peoples for non-destructive livelihood activities (NDLA), mostly in terms of agro-forestry related projects; and PhP12 million for production related livelihood activities¹⁶. With the termination of the CPPAP in June 2002, the LGUs and their barangay counterparts took over funding the management of the plan. Other entities such as the DENR and the NGOs, the local indigenous and migrant communities who are directly dependent on the park continue to maintain their stake (Canoy and Suminguit, 2001). In the later years, the local governments have also increased their funding for watershed management activities to as much as P2.6 million for Calendar Year 2002 (Mirasol, 2003). In March 2004, PAMB solicited funds from the private companies who are resource users of the watershed services by organizing a water policy forum. An amount of P48 million was pledged for the next twenty years (Sumbalan 2004).

On the other hand, the Lantapan Watershed Management Plan is for five years and is seen to guide the implementers in providing appropriate interventions to solve the acute water supply problem (LWMP 2002). The budgetary requirement for the plan is PhP 4.7 million. At the province level, all municipalities and cities have just formulated and submitted their final watershed management plans. The LGUs in Bukidnon have appropriated a total of P14.97 M for watershed management for CY 2004 (BWPDC minutes of the meeting, Feb. 20, 2004).

C. Technical /Administrative Capacities

The Mt. Kitanglad Range Natural Park Protected Area Management Board (MKRNP-PAMB) started operations in 1993, the Protected Areas and Wildlife Division (PAMD) of the DENR spearheading the effort. The office of the Protected Area Superintendent (PASu) became functional in 1994. The Protected Area Superintendent (PASu) is directly accountable to the PAMB and while the Provincial DENR supervises the day- to- day activities. The current PASu is an experienced forester. He is assisted by three employees who are not foresters, all highly aware of watershed management as a result of attendance to the various training programs in the province.

¹⁵ The grant is managed by the World Bank, in partnership with the Government, the Philippines (represented by the DENR) and the NGOs for Integrated Protected Areas (NIPA). All of these three are bound in a tripartite agreement. The NIPA is a national consortium of NGOs that manage the local host-NGOs selected at the site coordinating the project together with its counterpart entity, the DENR-Park Superintendent's Office (PaSU), and its corresponding PAMB.

¹⁶ The NDLA's rest on the principles of balancing sustainable development and biodiversity conservation to uplift the socio-economic conditions of the IPs and tenured migrants in order to mitigate human pressure on the protected watershed. A total of 79 POs are implementing NDLA Projects in the park and some of them became beneficiaries of CBFM Projects and are currently managing integrated livelihoods undertakings.

In Lantapan, there is no Municipal Environment and Natural Resources Office (MENRO), this position being optional by virtue of the Local Government Code of 1991. The current de facto MENRO is a staff of the Provincial Environment and Natural Resources Office (PENRO). This person has two bosses and thus, difficult to define where loyalty is. Alternately, Lantapan can deputize its Municipal Agricultural Office (MAO) to take charge of the conservation activities.

The BWPDC, through the BENRO which serves as its secretariat and interim implementing arm, has coordinated capacity building for all technical working groups from 20 municipalities and 2 cities. Nine training modules for watershed management, resource management appraisal, resource management options, technology of participation, policy analysis, technical writing, and strategic action planning have been completed. But the institutional structure for these trained personnel to function is still lacking.

In terms of formal training, the nearest state college that has a formal forestry course is the Central Mindanao University (CMU). The College of Forestry was established in 1966. Watershed Management (FRM 66) was offered as a major course in the BS Forestry curriculum since 1967 and in the Environmental Science Program. FRM 66 is described as the “Regulation, use, conservation, practices and treatment of aggregate resources of a drainage basin for the production of water; control of erosion practices, stream flow and floods.” In effect, the forestry graduates until this time may have taken a watershed management course with technical and physical aspects only and without regard for the role of people, policies and institutions. The short-term trainings are expected to deal with the social science component.

D. Social Governance/Institutional Capacities

PAMB is composed of 59 members from government and non-government sectors, and from local communities. The Regional Executive Director of the DENR-Region 10 acts as the chair of the board, while the Provincial Planning and Development Coordinator of Bukidnon serves as an ex-officio member. Members of the board are the municipal mayors of the eight towns sharing the boundary, 28 barangay captains of the village centers of the buffer zone, 9 tribal leaders, 8 representatives from the non-government organizations, three representatives from the media; 1 from the other government agencies and 1 from the people’s organization. The PAMB serves as the site policy-making body of the park.

But on the ground management is by indigenous communities, the local governments, and the PASu. The DENR represents the government of the Philippines. Other institutions involved in the management are the special interest groups such as the tenured migrants, industry sector (such as agribusiness (banana, poultry) and relay communication operators) as well as voluntary organizations (such as the mountaineering societies, research and academic organizations (Mt. Kitanglad Range Management Plan, 2000).

Other resource institutions involved in the conservation activities within the park includes the Center for International Forestry Research in the testing of an Adaptive Co-Management (ACM) approach to forest conservation and livelihood assistance to a community of farmers who are holders of community-based Forest Management Agreements (CBFMA). The Voluntary Services Overseas (VSO), on capacity building for CBFMA holders at the buffer zone. AusAID likewise promotes in the protected area farming systems improvement and the promotion of contour/conservation farming. Heifer Philippines International on animal nutrition and environmental management and providers of support to a local citizen water watch involved in monitoring of water quality and quantity, among others.

The upper watershed agricultural areas in Lantapan are theoretically under the jurisdiction of the MKNRP management. The lower watershed is under the auspices of the Lantapan government. On February 12, 2002, the Hon. Atty. Narciso M. Rubio, Municipal Mayor of Lantapan, issued Executive Order No. 2002-02 creating the Municipal Technical Working Group (MTWG) for Watershed Management and Development. Initially, it is composed of 10 member representatives from LGU (municipal and provincial), NGOs and other organizations. This group crafted the comprehensive watershed management plan of Lantapan. The Lantapan Watershed Management Council, a multi-sectoral body oversees the implementation of environment related programs and projects of the municipality. Presently, environment related programs are being implemented through the Municipal Management Office (MMO) and support staff such as NRM Program, Land Care, Clean and Green, Solid Waste Management Program, CBFM and other existing structure.

Beyond Lantapan, the BWPDC manages the watershed clusters. The BWPDC is, theoretically, a powerful body mandated to protect and preserve the remaining forest of Bukidnon. It is composed of the following: a) Provincial Government, b) Representative from concerned National Line Agency, c) Local Government Units (LGUs), d) Institutions, and e) NGOs covered by specific watershed clusters in the province. A technical advisory committee (TAC) advises the BWPDC in identifying programs and projects, but the BWPDC makes decisions by consensus.

E. Legal Structures/Political Capital

Various laws govern the management of the country's natural resources, in general and the watershed resources, in particular. Among these are the legislative provisions such as those in the Local Government Code (RA 7160), the various administrative orders of the DENR, and the ordinances of the local communities.

National Laws affecting Manupali Watershed

1. The Forestry Management Services of the DENR wrote Proclamation No. 127, establishing parcels of land in the municipalities of Lantapan, Valencia, Pangantucan and Maramag as watershed forestry reservation for the purpose of protecting, maintaining or

improving their water yield and providing a restraining mechanism for inappropriate forest exploitation and land use.

2. Republic Act No.7586 or National Integrated Protected Area System of 1992 (the NIPAS Act and accompanying implementing rules and regulations (DAO 25)) recognizes the critical importance of protecting and maintaining the natural biological and physical diversity of the environment and declares it the policy of the state to secure for the Filipino people of present and future generations the perpetual existence of all native plants and animals through the establishments of a comprehensive system of integrated protected areas within the classification of national park and provided for in the Constitution.

The NIPAS Act sets aside specific areas with unique features for this purpose. The Act also recognizes that administration of these protected areas is possible only through cooperation among national government, local government and concerned private organizations.

Mt. Kitanglad Range is one of the country's priority protected area following the NIPAS law. Republic Act 8978 is the enabling law signed on November 9, 2000. In following the processes of the NIPAS law, Mt. Kitanglad was proclaimed as a protected area under the natural park category through Presidential Proclamation No. 896 dated October 24, 1996.

3. Certificate of Ancestral Domain Claim (DAO 02). The recognition and protection of the rights of indigenous cultural communities to their ancestral lands to ensure their economic, social and cultural well-being is provided for in the 1987 Constitution. Furthermore, EO 192 empowers DENR to exercise exclusive jurisdiction on the management and disposition of all lands of the public domain. Similarly, RA 7586 (see above) provides for the due recognition of ancestral domains and other customary rights in protected areas.

DAO 02 acknowledge the above laws and orders, and recognizes the importance of promoting indigenous ways for sustainable management of natural resources such as ecologically sound traditional practices of indigenous cultural communities.

4. Comprehensive Agrarian Reform Law (RA 6657)

The 1987 Constitution provides for an agrarian reform program to redistribute all public and private agricultural lands (regardless of crop or tenurial management) to landless farmers and regular farmworkers. The Comprehensive Agrarian Reform Law (CARL) was enacted in 1998 and the Comprehensive Agrarian Reform Program (CARP) is to run for ten years. A significant proportion of the fifteen (15) million hectare of "timberland" under the control of the State are to be distributed to individual and community groups of resident upland tillers under various forms of stewardship. This is now known as the Integrated Social Forestry Program (later to be known as the Community based Forestry Program) with Certificate of Stewardship given to communities. These are to provide them secure tenure and usufruct rights for twenty- five (25) years with the option to

renew for a similar period. The implementing agency is the Dept. of Environment and Natural Resources (DENR) rather than the Dept. of Agrarian Reform (DAR).

In Lantapan, there are so far, 343 Certificate of Land Ownership Award (CLOA) and Emancipation Patents (EP) under 2,348 hectares.) DAR Bukidnon, 2003). Several groups of farmers also were able to partake of the stewardship contracts from the DENR, exact data are not available at this time.

Local Laws affecting the Manupali watershed and the Upper Pulangui watershed cluster

In Lantapan, there is an ordinance encouraging farmers to practice soil conservation measures. The incentive was that those practicing would have the priority participation in the DA's production program.

The following ordinances are being implemented by the local government of Lantapan to protect its environmental resources, which focus on 1) waste disposal, 2) management of stray animals, 3) sustainable agriculture, and 4) watershed protection. (Tabien, 2000):

A. Waste Disposal

1. Ordinance No. 50 Series of 1996 – Anti-Littering Act and Adoption of Zero Waste Management
2. Ordinance No. 63 Series of 1999 – Prohibiting the disposal of garbage, farm waste materials and dead animals in all rivers and to its bank

B. Management of Stray Animals

1. Ordinance No. 49 Series of 1995 – Regulating and/or limiting the number of hogs, livestock and poultry raised in backyards or residential areas
2. Ordinance prohibiting the stray animals within the watershed

C. Sustainable Agriculture

1. Ordinance No. 65 – Requiring all farm tillers to adopt contour farming on all sloping areas

D. Watershed Protection

1. Ordinance No. 54 Series of 1996 – Imposing Fines/Penalties for acts which endanger the environment such as the conduct of illegal logging/cutting within the municipality of Lantapan in support to illegal logging law of the Philippines.

Putting the ordinances into effect remains a challenge because of weak law enforcement and violations are not monitored.

F. Other agencies with watershed management programs in Manupali

- i) Department of Environment and Natural Resources (DENR)

The Provincial Environment and Natural Resources Office (PENRO) of Bukidnon, a national line agency, is the technical counterpart of BWPDC. PENRO has been doing the characterization of major sub-watersheds in Bukidnon since 1995. It has no particular project in the Manupali area, but its Community Environment and Natural Resources Office (CENRO) in Malaybalay, Bukidnon has reforestation projects in Lantapan through its Reforestation and Afforestation Division. Activities include plantation establishment and protection. In 2003, a 7-hectare plantation establishment for watershed rehabilitation was contracted to Basak Upland Farmers Association, Inc. at Basak¹⁷, Lantapan, Bukidnon (DENR-CENRO, 2003).

ii) The National Power Corporation (NPC)

The National Power Corporation (NPC) is committed to protecting the watershed areas under its jurisdiction. Over the last ten years, it has been initiating watershed management programs in these areas. In the Pulangui-Agusan-Talomo Watershed Area, NPC has been implementing projects related to watershed management through its watershed management division (Appendix Table 3). Budget allocation for watershed management activities by the NPC has been sustained from 1994 to the present. Currently, NPC has a total of 26 personnel in the Pulangui-Agusan-Talomo watershed area team. Only seven (7) of the technical personnel have degrees in BS Forestry. Others have degrees in Agriculture (4) and Engineering (3) (Appendix Table 4). NPC is also represented in the TAC of the BWPDC.

iii) National Irrigation Administration (NIA)

The National Irrigation Administration in Bukidnon has four (4) National River Irrigation Systems (RIS)¹⁸, including the Manupali RIS. The NIA provincial office has no projects related to watershed management, as it sees this to be the job of the DENR. However, as one of the member institutions, NIA actively coordinates with BWPDC in the conduct of watershed related activities. NIA's existing projects mainly focus on the repair and rehabilitation of the irrigation system like desilting canals and repair of structures and service roads. At present, they allocate a total of PhP700,000 for these projects.

IV. Challenges in Implementing the Manupali Watershed Management Approach

Political, social and financial support of environmental programs especially that concerning the MKRNP is due to the sensitivity of the political leadership on the environmental issue, the community involvement as a result of the high environmental awareness as a consequence of environmental destruction, and the participation of the private sector who acknowledges that the environment is an integral input in the sustainability of their business operations. The following is an analysis of the challenges

¹⁷The area is located near the Mt. Kitanglad Range Natural Park Buffer zone.

¹⁸The others are Pulangui River Irrigation System (RIS), Muleta RIS and Roxas-Kuya RIS. The total service area of these systems is 20,696 hectares.

in the implementation of the watershed approach as illustrated by the Manupali with at least three management entities.

A. Financial Sustainability

As of the moment, the MKNRP has come up with the financial requirements to implement the plan at least for the next five years. This was facilitated by several factors: 1. engagement of local communities in the activities and hence, some savings in the protection and guarding of the park; 2. local governments committed funds as a result of mutual trust among the membership of the management body, the PAMB; and 3. the trust and confidence given by the private sector to the PAMB in the management of the PA.

At the municipal and cluster levels, there is no guarantee that funds will be available for implementing the management plan. According to local officials of Lantapan, the town may be compensated for their stewardship of the water used by resource users like the NPC, and the NIA, and even the Valencia Water District. The rates of payments are actually still a subject of study.

B. Limited Economic Instruments

One source of revenue of the Park comes from user fee charges for the environmental services that it offers. For 2003, some Php 520,135.00 have been collected from visitors entry fee and land use fee/rental of the different establishments located at the range summit (Sumbalan 2004).

At the municipality and the cluster level, there has not been enough effort to also generate revenues for the resources use, basically because there are no or very limited economic instruments that can guide the local government to enact these. In Lantapan, water supplied to households is subsidized by the local government. Water user charges for plantation agriculture have not been properly defined. To really implement the watershed approach, resource user such as the NIA, should be willing to pay the upland dwellers for the service of the sustained water supply downstream.

There is also a need to look at national policies that govern watershed resources, particularly water. Our national law states that this resource is a common wealth and hence, cannot be priced. But given that water is getting scarce, this becomes an economic good. It is imperative for local governments or the cluster level watershed managers to define proper pricing for the resources and the services these resources provide. Fines and penalties for violations of the provisions of the plan also needs some economic instruments.

C. Administrative Mechanisms in watershed management

At the buffer zone, 370 Kitanglad Guard Volunteers (KVG) administratively under the DENR guard the forest and watch out for forest fires. These members of the local indigenous communities or the IPs promote biodiversity conservation in the

protected area and do patrol activities within the park. They report on illegal activities to the DENR and PASu aside from posing as escorts to DENR personnel during visits and are responsible in hauling apprehended logs within the park. They are annually deputized by the DENR to do the community-based park protection.

In Lantapan, the MENRO who is detailed from the BENRO is tasked to coordinate the implementation of the Lantapan watershed management plan. There is no expertise at the municipal level to carry out the plan. BENRO is responsible for technical services. In the set-up, BENRO provides the manpower with technical knowledge in overseeing the watershed program. There are plans to recall the BENRO employees detailed in the municipalities, due to financial constraints. In an ideal situation, A and D areas in the buffer zone should be the responsibility of the LGU.

D. Human Capital Constraints

Lantapan needs to build capacity in sustainable agriculture (SA) as part of watershed management. Presently, there is one forestry graduate employed in the Municipal Agricultural Office (MAO), it is not known whether the person understands SA. The agricultural technicians of the MAO can be trained to do some monitoring of soil resource degradation. The Lantapan has a trained water watch volunteer group that can be engaged by the LGU to monitor water quality.

E. Institutional Constraints

PAMB seems to be doing a good job in managing both the protection and the production forests of the park. What seems to be weak is the management of the forest and agricultural areas in Lantapan. The institutional mandate is actually not clear. For instance, national DENR conducts projects in the municipality. Several entities within Lantapan who do environmental projects are not coordinated. Ideally, the creation of a Municipal Environment and Natural Resources Office (MENRO) will ensure the coordination and sustainability of the program (Appendix Fig. 1).

The BWPDC, which manages the several watershed clusters in the province also has an unclear mandate. In reality, as a Council, it can only recommend policies because it is the SB and SP that have the mandates to formulate policies at municipal and provincial levels. As a Council it cannot execute plans because it only meets once or twice a year. Even convening the Council is extremely difficult (in terms of cost, time, and meaningful participation) because it has around 80 members (mayors and heads of offices). The quality of the members varies greatly because some members are new comers (e.g., newly elected mayors) and may lack the technical expertise to fully comprehend the importance of watershed management or technical expertise to propose sound policies. Continuity of membership is also a problem because elected officials come and go, especially if they lost the following election. Similar observation can be

said of project-based NGO members; when the project is over, so does the membership of the NGO representatives.

The BWPDC has a Technical Advisory Committee (TAC), to provide technical advise to the Council. Like the Council, the TAC cannot do **actual implementation, coordination, and monitoring of watershed programs**. The TAC regularly meets every quarter, but that is not enough to effectively manage the watersheds. In other words, the watersheds of Bukidnon would not be effectively managed by an ad hoc body that meets about four times a year.

There were efforts to counter this problem by the creation of the EXECOM, to serve as the implementing arm of the Council (see Appendix Figure 2). The members are the head of BENRO, representative of DENR, SP Committee Chair on Environment, and representative of NGO. But EXECOM is a smaller version of the TAC, populated by people who have full time responsibilities elsewhere in their respective offices. Like the Council and TAC members, the EXECOM members cannot commit 100% of their time to watershed management.

The BWPDC/TAC also needs a champion who can effectively communicate recommendations to higher decision-makers; and continuing capacity building of the BWPDC, TAC members, and TWGs at the municipal level. There is also a need to review the usefulness of having all sectors represented in the Council because it makes the Council oversized and difficult to convene and manage. Selection of TAC members should not be solely based on sectoral representation but technical expertise in order for them to make substantial contribution. The role of each TAC member as representative of an institution or organization needs to be very clear so that the said member knows what to contribute and what input is expected from him/her in the TAC activities.

At the moment, much of the activities of BWPDC/TAC are carried out by BENRO. But BENRO 's mandate is to perform the devolved functions of the DENR like the community based forestry management.

F. Lack of Legal Basis for the Management Structure

The MKRNP was enacted under the national law and aside from PAMB, which is mandated under the NIPAS law and the Kitanglad Act, it has a PASu under the DENR who is responsible for carrying out enforcement and prosecution functions. To illustrate, seventy-nine cases had been filed against forest violators around the park. Of these cases, the assigned prosecutors had attended 17 court hearings that led to final judgment of the accused (Sumbalan 2004). As a result, the encroachment into the protected areas by those seeking for agricultural and other economic opportunities has been minimized during the past decade.

On the other hand, there may be a need for a legal framework for the Upper Pulangui cluster management, similar to that of the MKRNP. Because of the lack of legal

support, the organization is fluid and basically depends on the goodwill of the current crop of politicians in the several municipalities included in the cluster.

G. Weak Property Rights

Earlier, the results of the monitoring of the plan implementation of Mt. Kitanglad revealed that some respondents are not enthusiastic in participating in activities because they don't have the secured rights to the land (Barretto and Casiple, 2002). Furthermore, the current conflicts of the IPs (in terms of ancestral domain claims as discussed in Catacutan et al. 2001) and the LGU in Lantapan for the rights to the use of water is another concrete example of the weaknesses of the property rights that are assigned to natural resources. In this conflict, the IPs residing near the mouth of the rivers and waterfalls are not willing to share the water for lowland household consumption, an LGU project on rural water supply. With these current conflicts, economic development in the area would be in jeopardy.

V. Conclusions and Recommendations

Will the several management entities now in place in the Manupali protect the watershed and facilitate sustainable economic growth? No one really knows the answer to this question, but the current activities aim to at least delay what is perceived to be an impending collapse of the watershed system of the province. One lesson learned in this exercise is that watershed protection can be implemented successfully by changing the locus of decision-making from national to local agencies. Decentralizing management does not merely mean devolving responsibilities previously concentrated with the national bureaucracy but also means accompanying devolution with decision-making authority to various stakeholders. Decentralization provided a venue for the participants such as the non-government organizations, local communities, indigenous peoples, and other related projects to come together for a common purpose, which is survival. The experience in Mt, Kitanglad demonstrated that sensitivity and recognition of cultural and local knowledge, as well as, flexibility to negotiate with various stakeholders sustain watershed protection and development activities (Sumbalan 2004).

In Bukidnon, watershed cluster plans have yet to be completed. The constraint as discussed is the weakness of the institution that supports this. The BENRO in the past has focused in capacitating¹⁹ the municipal officers to be able to develop their own watershed management plans. The municipal and city watershed management plans will be the basis for the formulation of a Bukidnon Watershed Management Plan. This needs to be done with some urgency. In Lantapan, the uncertainty of funds, the lack of local capacity and management structures and the weak or insecure property rights of the different cultural

¹⁹ This capability- building program is in line with the Provincial Government of Bukidnon and the Philippines-Canada Local Government Support Program in coordination with the Municipality/City Governments of Bukidnon who signed a joint MOA to carry out the Inter-LGU Capability Building Program on Watershed Management among the six (6) major river watershed clusters. The Local Government Support Program (LGSP) finances the trainings while BENRO facilitates the activities.

groups to the land and water resources are beginning to cause conflicts in the implementation of the said plan.

Recommendations

To effectively implement the Manupali watershed management plan, government and other stakeholders have to meet some real challenges.

First among these is the institutional reform challenge. Cluster watershed management may need a national legal document rather than just the province level ordinance. Presently, this is a loose grouping, and when personalities change after the elections, the plan may break down. Institutional reform also entails the strengthening of the property rights structure that now governs the resources. There must be some clear relationships between the provisions of the IPRA and the other national laws on the right to access to resources. DENR policies at the national level should also be consistent with the local traditions and cultures in terms of property rights definition.

Secondly, funding has to be sustained. One needs to redefine beneficiaries of “national wealth” to include the municipalities in the upper watersheds who are directly responsible for managing or mismanaging the sources of water. Because NPC is a direct resource user, funding can be taken from NPC 1 centavo per kilowatt hour. NIA can also give part of its budget in desiltation for upper watershed maintenance by creating incentives for farmers to do soil conservation practices. There must be a specific LGU annual budgetary allotment for watershed protection. The municipality also has to think about charging water user fees and other fees for eco-tourism activities. Sustainability of funds should be coming from these local sources.

Thirdly, capability building is still a challenge. But the kinds of expertise for watershed management are now much different. Trainings can be in the field of watershed management, policy analysis, GIS/GPS/Remote Sensing, Database Management, proposal writing, and data analysis. Technical Working Groups (TWGs) consisting of technical staff at both the municipal and provincial levels should be the main target of capacity building because they are more or less permanent stakeholders. Personalities who come and go (i.e. the members of the TAC of the BWPDC) can be provided orientation or appreciation seminars on watershed management, GIS, and policy analysis. Water watch groups can be supported in a sustained basis to be an LGU partner in water monitoring.

Last but not least, the watershed management entity has to develop policy instruments, in terms of resource user fees and regulatory standards consistent with the international standards. Water user fees are needed to sway behavior of users that water is a scarce commodity.

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Appendix Table 1. Existing environmental programs and projects in Lantapan, 2002.

| Project Title | Implementors | Source of Funds | Budget (no data yet) |
|---|-----------------------------------|---|----------------------|
| 1. Community-Based Forest | <u>PLGU</u> BENRO/DENR | DENR | |
| 2. Non-destructive Livelihood Project | PAMB-KIN-MKNRP <u>MLGU</u> | | |
| 3. Implementation of NMRDP | LGU | LGU & partner NGAs, NGOs, POs, & the private sector | |
| 4. Municipal Watershed Development Project | LGU | LGU | |
| 5. Cinchona Reforestation Project | <u>DENR</u> DENR | DENR | |
| 6. Muleta-Manupali Watershed Development Project | DENR | DENR | |
| 7. IPM-KasaKalikasan | <u>DA</u> DA with MAO | DA | |
| - vegetable | | | |
| - corn | | | |
| - rice | | | |
| 8. Conservation farming research | <u>NGOs</u> ICRAF | USDA | |
| 9. Tree domestication research | ICRAF (w/ CMU, ERDS, DENR) | SANREM | |
| 10. Soil modeling (parameterization) | ICRAF (w/ UPLB, MSEC) | ICRAF, ACIAR | |
| 11. Landcare (Lantapan Landcare Association –LLCA) Activities include adoption of SWC technologies i.e. contour farming, nursery establishment and management | <u>POs</u> Landcare | LGUs, NGOs, NGAs & fellow POs | |
| 12. Association of Tree Seeds for A/F in Lantapan (ATSAL) | MKAVI and DOLE | MKAVI and DOLE | |
| 13. River monitoring | Tigbantay Wahig Alsa Kalikupan | Auburn University – SANREM/LGU HPI-SANREM | |

Source: Lantapan Watershed Management Plan, 2002

Appendix Table 2. Proposed development projects by eco-zone in the four main tributaries of the Manupali Watershed

| Program/Projects | Unit of measurement | Unit cost | Budgetary requirements ('000) | | | | | Total |
|--|---------------------|-----------|--------------------------------|-----|-----|-----|-----|---------|
| | | | 1 | 2 | 3 | 4 | 5 | |
| Tugasan River | | | | | | | | |
| 1. Water bodies | | | | | | | | |
| -Mico-watershed management project | Has. | 26,000 | 65 | 65 | 65 | 65 | 65 | 325,000 |
| - River bank forest protection | Has. | 15,000 | 3.8 | 3.8 | 3.8 | 3.8 | 3.8 | 18,750 |
| 2. Built-up | | | | | | | | |
| -Animal dispersal | Head | 10,000 | 10 | 10 | 10 | 10 | 10 | 50,000 |
| -Adopt a mal-nourished child | Child | 30,000 | 6 | 6 | 6 | 6 | 6 | 30,000 |
| -BIDANI project | Brgy | 14,000 | 14 | 14 | 14 | 14 | 14 | 70,000 |
| -Water sealed toilet | No. of bowl | 50.00 | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 31,250 |
| 3. Agriculture | | | | | | | | |
| -high value vegetable production | Has | 10,000 | 10 | 10 | 10 | 10 | 10 | 50,000 |
| 4. Forestland/timberland | | | | | | | | |
| -CBFM | has | 10,000 | 2 | 2 | 2 | 2 | 2 | 10,000 |
| -Reforestation | | | | | | | | |
| -Salt program | | | | | | | | |
| TOTAL | | | | | | | | 585,000 |
| Maгнаo River | | | | | | | | |
| 1. Water bodies | | | | | | | | |
| -Mico-watershed management project | Has. | 26,000 | 65 | 65 | 65 | 65 | 65 | 325,000 |
| - River bank forest protection | Has. | 15,000 | 3.8 | 3.8 | 3.8 | 3.8 | 3.8 | 18,750 |
| 2. Built-up | | | | | | | | |
| -Animal dispersal | Head | 10,000 | 10 | 10 | 10 | 10 | 10 | 50,000 |
| -Adopt a mal-nourished child | Child | 30,000 | 6 | 6 | 6 | 6 | 6 | 30,000 |
| -BIDANI project | Brgy | 14,000 | 14 | 14 | 14 | 14 | 14 | 70,000 |
| -Water sealed toilet | No. of bowl | 50.00 | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 31,250 |
| 3. Agriculture | | | | | | | | |
| -high value vegetable production | Has | 10,000 | 10 | 10 | 10 | 10 | 10 | 50,000 |
| 4. Forestland/timberland | | | | | | | | |
| -CBFM | has | 10,000 | 2 | 2 | 2 | 2 | 2 | 10,000 |
| -Reforestation | | | | | | | | |
| -Salt program | | | | | | | | |
| TOTAL | | | | | | | | 585,000 |
| Alanib River | | | | | | | | |
| 1. Water bodies | | | | | | | | |
| -Mico-watershed management project | Has. | 26,000 | 65 | 65 | 65 | 65 | 65 | 325,000 |
| - River bank forest protection | Has. | 15,000 | 3.8 | 3.8 | 3.8 | 3.8 | 3.8 | 18,750 |
| 2. Built-up | | | | | | | | |
| -Animal dispersal | Head | 10,000 | 10 | 10 | 10 | 10 | 10 | 50,000 |
| -Adopt a mal-nourished child | Child | 30,000 | 6 | 6 | 6 | 6 | 6 | 30,000 |
| -BIDANI project | Brgy | 14,000 | 14 | 14 | 14 | 14 | 14 | 70,000 |
| -Water sealed toilet | No. of bowl | 50.00 | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 31,250 |
| 3. Agriculture | | | | | | | | |
| -high value vegetable production | Has | 10,000 | 10 | 10 | 10 | 10 | 10 | 50,000 |
| 4. Forestland/timberland (CDF program) | has | 10,000 | 2 | 2 | 2 | 2 | 2 | 10,000 |

| | | | | | | | | |
|------------------------------------|-------------|---------|------|------|------|------|------|-----------|
| -NDL activities | | | | | | | | |
| -Agro-forestry | | | | | | | | |
| -Nursery establishment | | | | | | | | |
| -Riverbank rehabilitation | | | | | | | | |
| -ISF project | | | | | | | | |
| -Reforestation project | | | | | | | | |
| TOTAL | | | | | | | | 585,000 |
| Kulasihan River | | | | | | | | |
| 1. Water bodies | | | | | | | | |
| -Mico-watershed management project | Has. | 26,000 | 65 | 65 | 65 | 65 | 65 | 325,000 |
| - River bank forest protection | Has. | 15,000 | 3.8 | 3.8 | 3.8 | 3.8 | 3.8 | 18,750 |
| 2. Built-up | | | | | | | | |
| -Animal dispersal | Head | 10,000 | 10 | 10 | 10 | 10 | 10 | 50,000 |
| -Adopt a mal-nourished child | Child | 30,000 | 6 | 6 | 6 | 6 | 6 | 30,000 |
| -BIDANI project | Brgy | 14,000 | 14 | 14 | 14 | 14 | 14 | 70,000 |
| -Water sealed toilet | No. of bowl | 50.00 | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 31,250 |
| 3. Agriculture | | | | | | | | |
| -Farm clustering | Has | 10,000 | 1000 | 1000 | 1000 | 1000 | 1000 | 5,000,000 |
| -Fresh water aqua culture | has | 200,000 | 40 | 40 | 40 | 40 | 40 | 200,000 |
| 4. Forestland/timberland | | | | | | | | |
| -CBFM | has | 10,000 | 2 | 2 | 2 | 2 | 2 | 10,000 |
| TOTAL | | | | | | | | 5,805,000 |

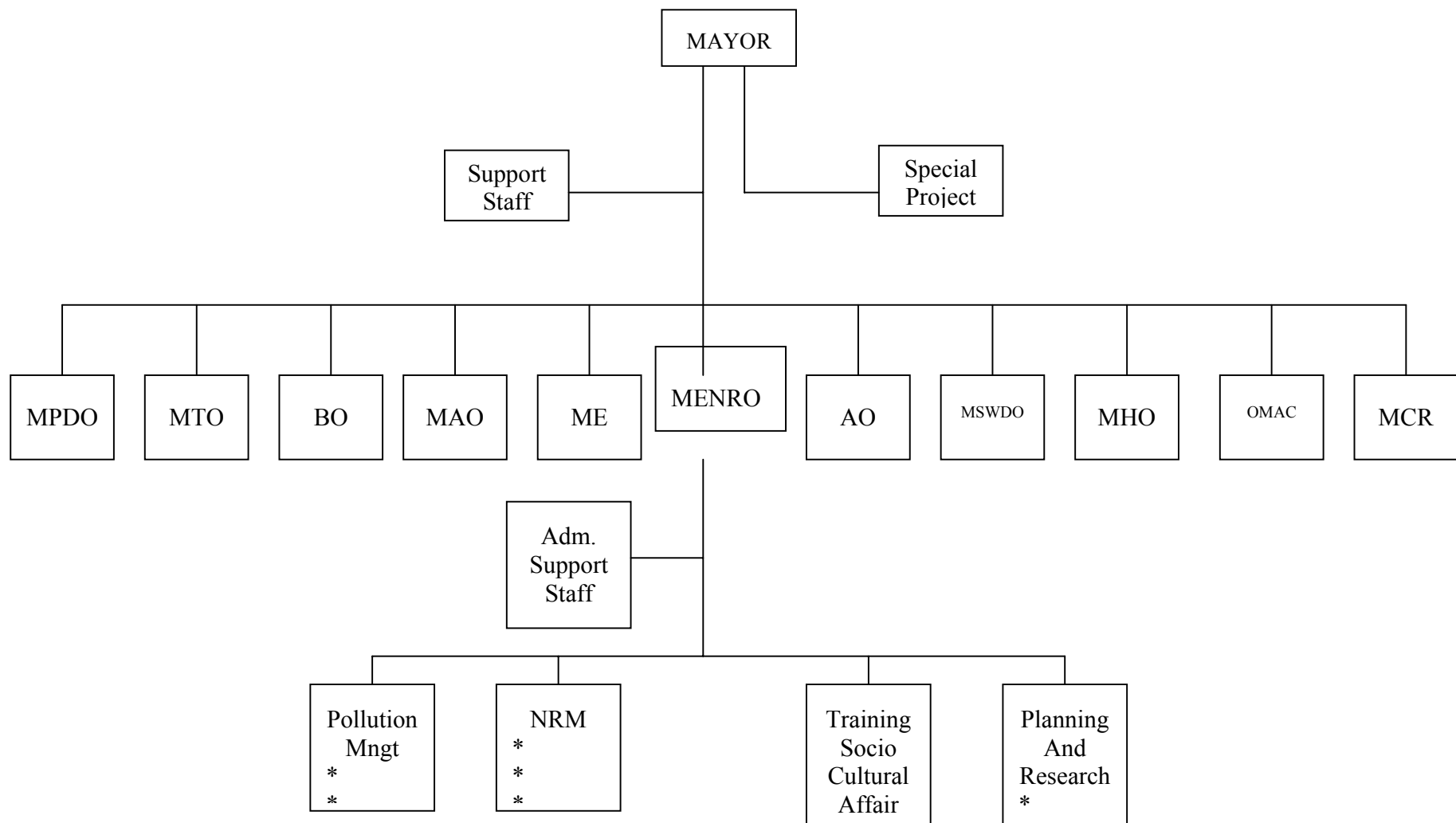
Source: Lantapan Watershed Management Plan, 2002

Appendix Table 3. Watershed management projects of the National Power Corporation and budget allocation, Valencia, Bukidnon, 1994-2003.

| Projects/Year | Budget Allocated (PhP) |
|---|------------------------|
| 1994 1. Contour hedgerows | 2,982,438.53 |
| 1995 1. Bamboo propagation and planting 2. Pilot conservation farm establishment 3. Fresh-water pearl culture- pilot office 4. Agroforestry promotion/expansion 5. Bio-engineering pilot project to demonstrate the technology and training of farmers 6. Community health assessment 7. Gathering of more data on soil properties, land uses, and resource related factors of environment 8. Collection/production of Acacia seeds for community dispersal and supply to other NPC Regional and Plant Office. | no data |
| 1996 1. Nursery Operation 2. Plantation Establishment 3. Land Use Development 4. Maintenance/Protection of Mt. Kitanglad Reforestation project | 3,352,500.25 |
| 1997 1. Nursery Operation of Pulangui and Agnus watershed areas 2. Plantation Establishment 3. Land Use Development of NPC landholding 4. Maintenance/Protection of Mt. Kitanglad Reforestation Project 5. ISO 14000 Certification 6. Multipartite Monitoring of ECC compliance 7. Resource development and conservation measures | 6,639,492.67 |
| 2003 1. Nursery Operation 2. Plantation Establishment 3. Land Use Development 4. Maintenance/Protection of Mt. Kitanglad Reforestation Project 5. Socio-economic survey 6. Watershed database acquisition/updating 7. Perimeter survey 8. Infrastructure construction development and maintenance 9. Extension and community development 10. Soil erosion and control measure | 5,919,281 |

Source: National Power Corporation, Annual Report 1994-2003.

**Appendix Fig.1. Organizational structure of LGU – Lantapan
(Showing the proposed MENRO)**



Appendix Fig.2. Operational structure of Bukidnon Watershed Protection and Development Council

