

# **Financing Reforestation for Improved Watershed Management in the Philippines**

**Danilo C. Mero**

**I**n the early 90's, the Philippines experienced an energy crisis. The El Niño phenomenon hit the country, thereby adversely affecting hydropower generation in the central part of the island of Mindanao. The indicated industry loss of frequent electricity outages on the island at that time was estimated to be about 100 million US\$ per month.

In the province of Lanao del Sur, Philippines there was a controversy about the operation of a hydroelectric power plant (HEP) using a relatively large freshwater lake (area = 360 sq. km., mean depth = 60 meters, normal lake water elevation = 702 meters above sea level) as its reservoir. The controversy started when a group of local inhabitants around the lake (predominantly populated by Maranaos who are mostly Muslims) vehemently opposed the scheduled October 1990

final testing of the plant by staging a demonstration and resorting to legal means to stop the operation of the plant on the ground that it would seriously affect their socio-economic, religious and other activities when lake level would fluctuate at wide range. The National Power Corporation (NPC), a government owned and controlled corporation, prevailed in that controversy.

The NPC played a key role in the watershed management of the Lake Lanao-Agus River area. This role can be viewed from two different angles. In the first place, its interest, of course, was to sustain the operation of the six Agus hydro-electric power plants (with total generating capacity of more than 700 megawatts). This interest, according to the NPC, was coupled with an internal corporate drive towards environmental excellence. Secondly, NPC played a role as a catalyst in the process of balanced overall development within the Lake Lanao – Agus River watershed and the island of Mindanao. NPC's linkages with and active participation in the Lake Lanao watershed Protection and Development Council proved to be elemental in achieving this aim.

As initially indicated, the source of water used for power generation is Lake Lanao in the heart of Lanao del Sur. Thus, there is a basic concern for the watershed manager to secure the watershed in terms of sustainable water yield. In line with this concern, in 1992, NPC was able to secure fund for the development of about 1,000 hectares of tree farms within the Lake Lanao-Agus River watershed reservation in Lanao del Sur, Philippines. A financial contribution of about 1.1 million US\$ was made by the Mindanao Association of Industries (MAI) through the Mindanao Association of Electric Cooperative. This amount represented a corporate investment of industries and utilities for the improvement of hydro-electric power generation. It was used to finance development activities in reforestation and environmental rehabilitation for improved water yield.

A description of the highlights of the said project can probably lead to a better understanding of the socio-economic issues and concerns in watershed management.

## **Objectives of tree farm development project**

The general aim of the reforestation project was to ensure a more or less continual and sustainable hydro-electric power generation of the Agus plants through improved water yield of the Lake Lanao-Agus River watershed reservation. The specific objectives of the project were:

1. To develop about 1,000 hectares of tree farms within the Lake Lanao-Agus River watershed reservation in three years from 1993 to 1996;
2. To raise the stakeholders' level of awareness of the value of the watershed and the need for its protection and conservation; and
3. To gain the stakeholders' support for the project.

## **Brief background and description of the project area and the people**

### *The Lake Lanao-Agus River Watershed System*

Lake Lanao, the second largest freshwater resource of the country, is located in the heartland of Mindanao and has a normal water elevation of 702 meters above sea level with a surface area of about 36,000 hectares. It is fed and recharged by five major tributary rivers. The limnological study (Frey, 1968) revealed that the deepest part of the lake is 118 meter and the mean water depth is 60 meters. Its only outlet is the Agus River (the word "Agus" in the local dialect means flowing) which cascades 700 meters down to Iligan Bay at a distance of only 36 km. The total (Lake Lanao and Agus River) watershed area is about 186,000 hectares. The area is clustered with mountain ranges. As compared to most part of the country, the project area has a relatively cooler temperature with an annual mean maximum and minimum temperatures of 22.8°C and 21.7°C, respectively. Relative humidity fluctuates from 79% to 90%. The cooler months from October to February are also the humid months. The average daily evaporation

rate of the area is from 1.0 mm/day to 5.0 mm/day and the cooler months, as mentioned earlier, correspond to low evaporation rate. During these months, the days are rainy, humid, cloudy and windless. The mountain barriers of the lake receive an annual rainfall of 3000-3500 mm, mainly due to the southwest monsoon. For the region as a whole, the average is about 2500 mm.

### *The Maranaos*

The Maranaos or the “people of the lake” has an estimated 1980 population of 750,000 of which more than 90 percent are Muslims. The extent of their attachment to the lake was aptly illustrated by Lindy Washburn in her article, “Our Lake for Others,” which described the Maranaos this way:

As long as the Maranao have been a people, Lanao—the lake—has existed. To the lake they have bound their identity; in their own eyes and in the eyes of the outsiders they are Maranaos, the people of the lake. On their shores they established their villages and town and built their mosques; with its water they purify themselves for prayer; in its wetlands they cultivate their rice; from its depth they gather fish; across its expanse they transport their goods and people; from it they take water for drinking and cleaning. Each boulder and island in the lake, each hill and valley in the land surrounding it seems woven into the legends and epics of the people. And each Maranao can willingly trace his ancestry to the original “pat a pegampong” – four encampments on the lake, and their mythical founders. Thus it is with some justification and no little pride that the Maranaos consider Lake Lanao “Our Lake.”

## Major Project Components

### A. Social Preparation

The project's operation manager initiated a series of consultation meetings with various stakeholders, from the barangay level up to the municipal level. These meetings included very frequent congregations at the mosques during Fridays, the day of worship among Muslims. The main context of the said meetings focused on the need and importance of cooperation among the local folks in the preservation of the Lake. The people are usually enjoined to take heed of the divine injunction to protect and preserve natural resources, which is a gift from God. Coupled with these are scientific and helpful indigenous justifications for conserving the environment. The project manager solicited the people's willingness to participate in the program by enlisting them as farmer cooperators.

### B. Establishment of Tree Farms/Reforestation

Those who enlisted to participate in the project were then asked to apply and comply with some project requirements, such as:

1. letter of intent
2. authenticated proof of land ownership (xerox copy of land titles and real tax payment)
3. sketch of land property
4. referral from village chief
5. others

The project management team acted upon the application by scheduling the following activities to each prospective project cooperators:

- “ Land use. Survey mapping and planning (LUSMP). Notices were given to the applicants on the schedule date and time of LUSMP in their area. The project management (PM) then sent a team to the field with the cooperator providing some of the logistical

support such as area guide in the conduct of the said activity. The team processed the SUSMP data and came up with schedule of forthcoming activities of the project and a technical map of the area for tree farm or agroforestry development.

- “ Site preparation. This was done sometime after the LUSMP. It involved clearing, land preparation and staking. It was done by the farmer cooperators who were to be compensated by the project as part of labor cost.
- “ Tree planting. Seedlings were brought to the area for planting. The prescribed spacing was 3m x 3m for tree farms and 1m x 10m line planting for agroforestry farms (thus, the average number of trees planted per hectare was about 1,000). A representative from the PM supervised the actual field planting activity.
- “ Maintenance of planted seedlings. After two weeks, the area was inspected for survival, thereupon replanting of dead seedlings were imposed. This inspection activity was again done for purposes of payment of labor. Maintenance of the established tree farms were done after three years, when the trees were again subjected to final inspection.

At their end, the PM managed the following activities:

- “ Procurement of quality seedlings were sourced out from private nursery-operators. Tree planting materials were bought from nursery-operators or commercial seedling producers. The seedlings bought were then transported to the PM site for care and maintenance until they were brought to the field for out-planting.
- “ Disposal of seedlings to farmer cooperators and non-cooperators. Non-farmer cooperators who were also interested in the project could avail of free seedlings upon request and proper endorsement from the local leaders.
- “ Field supervision. All field activities of the project were done under

very close supervision from the project staffs assigned to the project. The signature of these field staffs were necessary for the financial payments to cooperators.

- “ Monitoring and evaluation. Monitoring and evaluation were done every other three months until the ninth month. During the initial (1<sup>st</sup> year) and final (3<sup>rd</sup>) inspection, representatives from the NPC main office in Manila came to validate reports of project accomplishment.

## **Results and Project Accomplishment**

- “ Community participation was ensured after six to nine months of social preparation prior to the initiation of the project. Community and religious leaders were very instrumental in convincing the people through their influence to give full support to the project. These leaders themselves were convinced that the success of the project depended much on the support that could be elicited from the general public.
- “ More than 150 individual cooperators representing their households participated by way of contracts for the development of their area into tree farms as well as agroforestry farms. Technical as well as management support and assistance were provided by the Paper Industries Corporation of the Philippines (PICOP). More than 1,500 hectares of private land were developed into tree farms and were planted with *Acacia mangium*, *Durio zibethenus*, fruit trees and other indigenous tree species. Non-cooperators requested seedlings from the project for their own reforestation and agroforestry activities, thus, indirectly supporting the project.
- “ Post-project monitoring and evaluation of the established tree farms indicated a very high tree survival rate of more than 95 percent and favorable growth rates. In 1996, the project management was turned over by PICOP to NPC who then continued the rehabilitation effort through internal corporate funds.

- .. Soon after the termination of the project, the tree farmers formed themselves into tree farmers cooperative by municipality. Later they formed themselves into a federation of tree farmers cooperative. One of the main purpose of their cooperative was to be a venue for update of its members on the development of their own farms and to see from among themselves the fruit of their labor.
  
- .. By the year 2001, most of the *Acacia mangium* trees are of harvestable age. The lanzones (*Lanzium edule*) fruit trees planted from the project farms were now producing fruits on season in commercial quantity. NPC was also involved in the process of assisting the tree farmers in the optimal utilization of their harvestable timber stock. Value added activities such as general lumbering and furniture timber stock. Value added activities such as general lumbering and furniture making were eyed as possible alternatives to stumpage sale.

### **Discussion and Analysis**

Reforestation or tree plantation establishment is one of the most direct ways of restoring a degraded area/land. Yet reforestation alone will not be successful unless it is combined with other practices. These practices include proper site selection and the use of quality planting materials. Coupled with the above mentioned practices, which are equally important for the success of a reforestation project, are: good planning, good management and full local community support.

In the national scale, Phase 1 of the Philippine reforestation (foreign aid worth 300 million US\$) was wasted due to very poor performance of about 10-15% seedling survival. Yet the government gambled with Phase II (180 million US\$) with a rate of survival of planted seedling reflected at only 20-25 percent. The experience showed that the availability of funds to finance reforestation is not at all a problem. There was only the problem in effectiveness and efficiency in program implementation.

In this national project, the agency primarily in charge of

reforestation, the Department of Environment and Natural Resources (DENR) has been taught a lesson on how to do the job better. Some few healthy comparisons between the Lanao project and that of DENR may drive this point well:

1. Generally, the DENR awards largescale reforestation contracts to small-time contractors who cannot afford to handle initial project fund requirements. Thus, DENR provides, the mobilization fund of about 30 percent of the total project cost. It may be noted that the contractor's overall project performance of about 10-25 percent in the national scale is less than this 30 percent release. In the Lanao project, NPC, the fund manager commissioned PICOP to handle the project. PICOP is well known in tree farming at the industry level, as well as in the farm level, for implementation. Moreover, payment to tree farmer cooperators, were made after completion of activity or task. Thus the certainty of success was very high;
2. In government projects, social preparation is generally weak. And in the case of government reforestation projects, contracts are won by outsiders. These contractors have difficulty gaining the support of the community because the project area is alienable and disposable land. In the Lanao project, tree farmer cooperators have property rights to begin with. They own the land or the community has control over the area through their leaders. They protect the land as their own. The project is sustained because the community or the cooperators impose upon themselves the sustainable management of their own land. There is continuity in management. This is management by self-motivation; and
3. The financing of Philippine reforestation from aid money cast the die for its predicted failure. Foreign aid money is usually used casually and not treated with much discretion. On the other hand, money generated from private industries are generally used for good intentions. In the Lanao project, the challenge and initiative to succeed is more than a driving force than the amount of money for the project. The target to plant 1 million seedlings was

surpassed by project cooperators and non-cooperators. A total of 3 million seedlings were procured based on the actual need. These seedlings were disposed of for field planting. Maybe NPC and PICOP did not financially gain much from the project but the goodwill it has created is more than enough to pay for the loss. Moreover, the long term future benefits on the intergenerational sustainability of the watershed is indeed worthwhile investing after all.

The following items are worth mentioning here: (1) The source of fund was the MAI. It acted generously upon the request of NPC not to return the amount of 1.1 million US\$ as refund for excess payment of electricity bills and used it for the rehabilitation of the watershed of Lake Lanao.; (2) NPC was the project fund manager, and (3) PICOP was the project contractor and the Maranaos were the cooperators of the project.

NPC's continuation of the tree planting effort in the Lake Lanao-Agus River watershed is well noted. It showed that the company policy has improved on the area of budget allocation for environmental rehabilitation and conservation. The company's focus on infrastructure for power generation and transmission is balanced with environmental and socio-economic consideration.

### **Future outlook**

As earlier indicated, this innovative experience in financing reforestation is a success story. It is humbly recommended that the DENR considers some of the salient features, highlights and learning experiences from this project for possible adoption and for possible policy changes in its reforestation program.

### **Acknowledgement**

The valuable support of Jelle Maas and Pita Verweij at ETFRN, in terms of their invaluable suggestions for the improvement of the paper, and the financial support by FAO which was facilitated

by Adrian Whiteman, Forestry Officer Sector Studies, are gratefully acknowledged by the author in the realization of this paper.

## REFERENCES

- Basic Community Organizing Handbook for Community-Based Forest Management Programs. 1996. DENR, Quezon City, Philippines.
- Cali, C.A. 1990 Assessment of growth and nodulation of *Acacia mangium* Willd. and *Sesbania grandiflora* (L.) Pers. In two Philippine soil types. Thesis (Ph.D.), University of the Philippines at Los Baños, College, Laguna.
- DENR Administrative Order No. 96-29, Rules and Regulations for the for the Implementation of Executive Order 263, Otherwise Known as the Community-Based Forest Management Strategy (CBFMS).
- DENR Memorandum Circular No. 97-12. Guidelines for the Formulation of Community Resource Management Framework and Annual Work Plan for Community-Based Forest Management Areas.
- Executive Order No. 263, series of 1995. Adopting Community-Based Forest Management as the National Strategy to Ensure the Sustainable Development of the Country's Forest Land Resources and Providing Mechanisms for its Implementation.
- Frey, 1968. Limnological Reconnaissance of Lake Lanao. Mindanao State University, Marawi City, Philippines.
- Gallardo, O.C. 1991. Reservoir Sizing by Transition Probabilities as Applied to Lake Lanao Controversy.

- Matela, A. G. (1984), "The Agroforestry Development Plan and Practices of PICOP", in: Jackson, JK (ed.) *Social Economic and Institutional Aspects of Agroforestry*, The United Nations University, Tokyo.
- Sajise et al. 1990. U.P. National Assessment Project. State of the Philippine Environment. U.P. Press, Diliman, Quezon City, Philippines.
- Serna, C.B. 1993. Community-Based Resource Management: Perspectives, Experiences and Policy Issues Related to Forestry and Upland Development. In: Community-Based Resource Management: Perspectives, Experiences and Policy Issues, Fellizar, F.P., Jr. (Ed), pp. 64-81, College, Laguna, Philippines.