Rainforestation Project in the Mt. Malindang Range Natural Park: Socioeconomic Effects a Year Hence

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Abstract

Mt. Malindang Range Natural Park is a protected area in Misamis Occidental, Philippines. It was the site for a biodiversity research programme (BRP) by Filipino and Dutch natural and social scientists in 1999-2005. As a spin-off of the BRP the Park is now the beneficiary of a massive rainforestation project being implemented by *Trees for Travel* Foundation and DENR-PAMB with the participation of the local government units and the Park residents.

A socioeconomic monitoring of the rainforestation project is being done to assess how the project improves the well-being of residents – mostly Subanen or with Subanen lineage – in five barangays within the core and buffer zones of the Park. Well-being components focus on employment and income generation, and access to social services such as education, health care, electricity, and potable water. A triangulation of qualitative (focus group discussion, key informant interviews) and quantitative (surveys) data, both primary and secondary, was employed.

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Preliminary results show that the gathering and growing of wildlings/seedlings give employment to the local people, increasing the income of workers involved by 20% to 200%, depending on the number of days they have been hired. As a result, workers are able to access safe water, provide electricity to their households, purchase radios and mobile phones, plan for the schooling of their children, and more importantly, have added rice and fish in their diet. Moreover, a vibrant local economy is emerging due to an increase in the purchasing power of households. Men and women are given equal employment opportunity in the project, though only 11% of those hired are women due to the women's preference to tend to their children, household chores and home gardens.

The introduction of vermiculture to produce organic fertilizers for farms and the project nursery has increased both agricultural output and the survival rate of seedlings. Given the project's balanced perspective on the Park's ecosystems and human well-being, residents are increasingly becoming mindful of protecting the Park.

Keywords: rainforestation, biodeversity conservation, livelihood security

Rationale

Mt. Malindang Range Natural Park (MMRNP) is a protected area situated in portions of Zamboanga del Norte and Zamboanga del Sur in Region XI and much of Misamis Occidental in Region X, occupying most of the area 800 masl of the province and has a maximum elevation of 2,404 masl (NIPAP-DENR, 2000). Though degraded, Mt. Malindang hosts diverse and rare species of flora and fauna, which include rare and endangered species such as the Philippine Eagle, Flying Lemur, Philippine Deer, Tarsier, Rufus Hornbill and the Giant Scope Owl.

The MMRNP covers 53,262 hectares but the forest cover has been continuously declining. A Landsat (TM) image analysis done by ALTERRA for the Park shows that the forest cover was down to around 12,000 hectares in 2004. Deforestation started in the 1950s and its natural resources continue to be threatened by anthropogenic activities, mainly by local residents. In 2004 there were about 4,000 families living inside the Park and about 15,000 families residing within 5 kilometers from its boundaries. These were mainly Subanen or with Subanen lineage, and an increasing number of migrant Bisayâ. No current population estimates have been cited.

Most of the families in and around the Park are marginal and subsistence farmers. They would often turn to the forests for additional income through the illegal cutting of trees for timber and firewood, and illegal hunting or gathering of non-timber forest products. The result of this deforestation has reduced the water supply for the adjacent agricultural areas in the uplands and lowlands, as well as the rice fields in the coastal areas. Deforestation is also causing more erosion, flooding, and landslides in the area.

The Park is currently a beneficiary of a massive rainforestation project. Rainforestation is a reforestation strategy where plantations of indigenous tree species are established in a substantial area of deforested land to create 'near natural' forests that resemble the original tree species composition of a natural rainforest (Mt. Malindang Rainforestation Project, Monitoring Report Phase I, 2009). The project is a direct spin-off of the Biodiversity Research Programme (BRP) undertaken by Filipino and Dutch natural and social scientists in 1999-2005. A Dutch funding organization, *Trees for Travel* Foundation (which invests in carbon dioxide sequestration projects, e.g. tree planting in combination with forest conservation) is financing the project, with co-financing from the Philippine government through the Protected Area Management Bureau (PAMB) of Region X. *Trees for Travel* Foundation, which will be the legal owner of the CO_2 credits from the new plantations and forest conservation, is supported by people and transport companies aiming to compensate for the greenhouse gases resulting from air flights and other forms of transport. The project establishes plantations (50 has/yr.) of indigenous tree species within the boundaries of the Park. Twenty percent of the plantations (10 has/yr) are for village forests and are

planted to fast growing tree species and fruit trees to sustainably supply local need for fruit, timber, and fuel. The project intends to put in place comprehensive, sustainable and participatory approaches and get the commitment among the different stakeholders to prevent further destruction of the Park's natural resources and to sustain its life-support services.

Review of Literature

Culture, the Local Economy and Environment. The discourse on the twin crises of culture and environment and the essential connection between biological and cultural diversity underscore the role of the social sciences in environmental protection and management. Sto. Domingo (1996), Bennagen and Lucas-Fernan (1996), among others, assert that the causes of environmental problems partly lie in the interactions among social and ecological processes. Using the people-environment nexus, it has been argued that the erosion of biological diversity can be traced to cultural crisis brought about by sociocultural changes or weakening of sociocultural institutions and identity, commodification of land, extinction of traditional knowledge system and the unregulated use of technology.

Bennagen and Lucas-Fernan (*ibid.*) say that experiences on the interrelationship between human societies and environment are varied. For instance, some indigenous communities have contributed to environmental degradation by over-exploiting certain resources. "In making their swidden or kaingin, the fallow is shortened thus making regeneration into forest difficult. Pigs and deer and other wildlife are over hunted and over-trapped. Some have gone into illegal logging while others have caused intentional fires and for the re-growth of grazing lands." Moreover, other factors such as pressures from migrant settlers and suffering from displacement due to counter-insurgency operations in their areas also affect resource management.

Particularly on the Mt. Malindang Subanun, it was found out by the Socio-economic and Cultural (SEC) Studies of the BRP that the early subsistence economy produced minimal disturbance to the environment but the eventual commercialization of agriculture disturbed not only the environment but also the Subanun way of life (Roxas and Poblete, et. al., 2005; Castro and Viloria, et. al. 2006; Roxas and Gomez, et. al., 2006). The new livelihood presented a technology initially unknown to the Subanun

but who, in struggling for survival, have enhanced their skills for innovations and combined the introduced technology with their indigenous knowledge. Some adjustments were conservationists, others, not. Further, the increasing population of migrants in what was considered the ancestral domain of the Subanun and laws that prohibit access to forests render the Subanun hold on their territory precarious. The SEC Studies saw a clear connection between environment and livelihood: as people aspire to gain a living, they impinge on their environment. Approaches that put people at the centre of development were therefore seen by the SEC Studies as increasing the effectiveness of support aimed at alleviating poverty and sustaining biodiversity.

The above findings are supported by literature that reveal the unrecognized links between environment (especially biodiversity conservation, ecosystem services) and human well-being. The literature cite the existence of a relationship between environment and human societies, asserting that environmental change affects poor people's well-being, both positively and negatively, and that poverty causes further environmental degradation (Conservation International-Philippines' citing World Commission on Environment and Development, 1987; Durning, 1989; Cleaver and Schreiber, 1994; Ekbom and Bojo, 1999). Additionally, the literature contend that mismanagement of the natural resources generally causes widespread poverty, weak food security, and poor health in the country. With deforestation, there is habitat destruction and subsequent reduction in biological resources. Degradation of air, water and land resources is recognized as having worsened, but not attributed to the direct impact of extractive industries (logging, mining, over-collection/harvesting) and unsustainable resource utilization, weak institutional arrangements, and weak policy frameworks.

The Millennium Ecosystem Assessment (MA, 2001-2005) is a response to government requests for science-based information, to enhance conservation and the sustainable use of ecosystems, while addressing the goals in human well-being. Among others, the MA components include poverty reduction and environmental protection. Recognizing that people are integral elements of ecosystems, the key components of human well-being are the *basic material for good life* - adequate livelihoods, sufficient nutritious food, shelter, access to goods; *health* - strength, feeling well, access to clean air and water; *good social relations* - social cohesion, mutual respect, ability to help others; *freedom*

of choice and action - opportunity to be able to achieve what an individual values doing and being (*Ibid*). There prevails a great challenge in adopting the MA approach to address the needs of human well-being across ecosystems. Most importantly, the aspects of social desirability, economic development, and ecological integrity must intertwine in approaching the issues to achieve sustainable development in the hinterlands where it is most elusive.

The ecosystems and human well-being framework being forwarded by the MA reiterates the advocacy of the Kyoto Protocol in 1997 for emission reduction targets in developing countries while obtaining sustainable development. In line with the latter, a project known as ENCOFOR (Environment and Community – based Framework for Designing Afforestation and Revegetation Projects) tries to integrate synergies between carbon sequestration and creation of benefits for the local environment and stakeholders *(joanneum.at/encofor).* ENCOFOR operates on collaborative efforts of stakeholders to design Clean Development Mechanism Afforestation/reforestation (CDM-AR) projects in such countries as Bolivia, Ecuador, Kenya, and Uganda. The application of the CDM-AR approach is seen in the Reforestation and Carbon Project in Sanga District, Niassa province, Mozambique *(http://www.greenresources.no/).* It aims to sequester carbon through planting and maintenance of commercial forests, to establish and manage commercial plantations to meet the growing sustainable forest management, to promote environmental protection and conservation, to facilitate socio-economic development of community forest plantations by provision of free seedlings and technical advice, thus reducing pressure on existing forestland and supporting infrastructure development within the region. The Mt. Malindang rainforestation project takes inspiration from efforts such as this.

On gender roles with regard to forest management, Joshi (2007) and Agarwal (2002) have pointed to the participation of both men and women in reforestation efforts as significant. Agarwal particularly observed that reforestation projects in India and Nepal that were implemented without a gender perspective faced problems when replanting, protecting the forests and implementing rules that protect the forest resources.

Conceptual Framework

It is widely recognized that the fundamental ecological processes are being influenced by anthropogenic activities. Once extractive activities take its toll, there is habitat destruction and subsequent reduction in biological resources. In general, the framework hinges on sustainable development where the environmental and socioeconomic considerations take center stage in any development endeavor. This entails monitoring the socioeconomic dimension of biodiversity as people are integral parts of the ecosystem. As Caldwell (cited in Sto. Domingo, 1996) contends:

> *The ways in which people relate to their environments and other living species, appear to be influenced by their entire cultural matrix... the tendencies of modern cultures have caused the continuing attrition and destruction of the biosphere (such that) fundamental cultural changes will be required if the many efforts now focused in various aspects of environmental and biospheric protections are to succeed.*

Mentioned earlier are literature pointing to the unrecognized links between the environment and human well-being. Poor people are said to be often impoverished by a declining resource base and forced by circumstances to degrade the environment further. This implies that high poverty indices show negative impact on the environment.

The lives of the indigenous populations are closely interlinked with their natural environment for their livelihood and sustenance. The sustainability of their knowledge systems and resource management practices require proper resource utilization and environmental conservation.

Figure 1 presents the conceptual framework showing the collaborative efforts of the private and government institutions (*Trees for Travel*, a Dutch Foundation, and the PAMB-DENR), academe (MSU-Iligan Institute of Technology for the socioeconomic monitoring and Central Mindanao University for the biophysical monitoring), local government units and the local residents (Subanen and non-Subanen). It is expected that with the rainforestation project, access to social services

and economic welfare by Park residents will be enhanced. Indicators for access to social services include education, health care, power/electricity, and potable water while economic welfare pertains to employment, income and durable items owned. It is hoped that through the rainforestation project the twin goals of livelihood security and biodiversity conservation in the Park will eventually be achieved.

The figure below shows the analytical framework of the study:

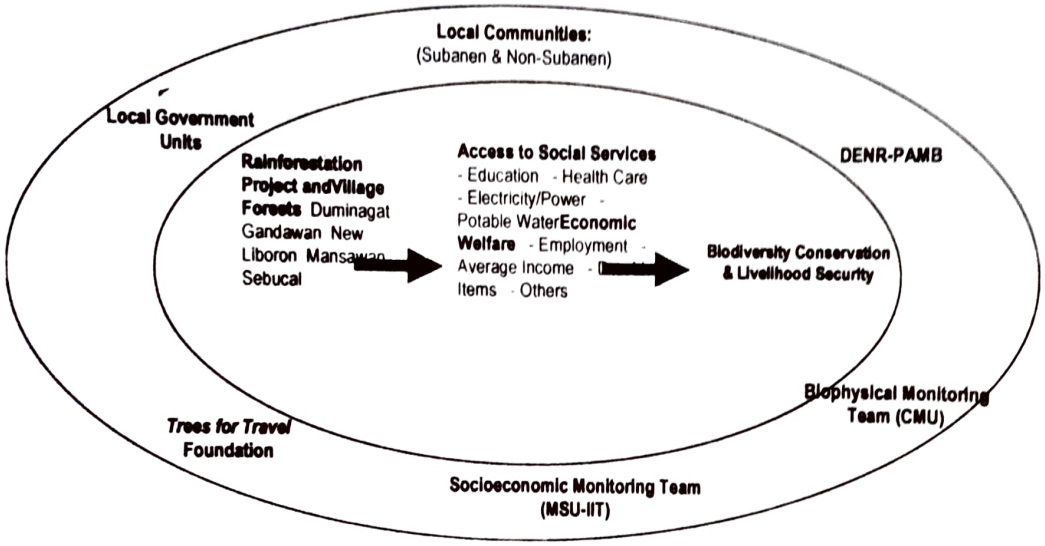

Figure 1. Analytical Framework of the Study

Objectives of the Study

The general objectives of the project are as follows (Mt. Malindang Rainforestation Project, Monitoring Report Phase I, 2009): sequestering CO_2 by creating plantations of indigenous trees; sustainably managing the areas by a guaranteed yearly payment scheme to local residents for at least 30 years; safeguarding biodiversity by creating buffer zones (plantations of near-natural forests) around the old-growth forests and providing alternatives for fuel and timber wood in village forests for the local communities; protecting the watershed and safeguarding the water supply by planting on steeply eroding slopes; improving the livelihood of local people by providing employment opportunities in, for example, nurseries, planting, and maintenance; and promoting the project as an example of sustainable development.

The specific objectives of the socioeconomic monitoring are the following: monitoring the improvement in the livelihood of residents in the buffer zone (Mansawan, Gandawan, and New Liboron) and in the strict protection zone (Duminagat and Sebucal) of the Park where Subanen and other local residents will be provided equal opportunities to work in the project; assessing the Park residents' access to basic social services (health, education, power/energy, water supply) and how this is enhanced by the rainforestation project.

Methodology

The methodology is a triangulation of the quantitative and qualitative techniques in research. For the quantitative method, a socioeconomic survey using a standardized survey instrument was employed to elicit data. Where available, secondary data supplemented the primary data that were gathered. Qualitative data were obtained through interviews with key informants consisting mainly of the Subanen men and women who play a vital role in the Park and through focus group discussions. Actual observation of community life and resources enhanced the data recording and analyses.

The Research Area

The monitoring area covers barangays Mansawan, Gandawan and New Liboron in the buffer zone and barangays Lake Duminagat and Sebucal in the strict protection zone of MMRNP. The barangays, except for Sebucal, are situated in the municipality of Don Victoriano, a fourth class municipality in Misamis Occidental. All five barangays are contiguous but have varying elevations and undulating mountain slopes. Mansawan, which is 1,269-1,303 masl, is the entry point to the other barangays and is accessible to transportation. It has a large area of 1,606 hectares (PALS, 2000, cited in Roxas, Poblete, et. al.). Adjacent to it is Gandawan, a crater valley, with elevations ranging from 1,240 to 1,280 masl. Its plains measure about 102 hectares (ibid.) New Liboron, previously called Palo Cinco, is located south of Mansawan and west of Gandawan. Its residents are relocatees from Liboron, a part of the strict protection zone. The relocation was deemed important by the Provincial Government of Misamis Occidental and the provincial PAMB to avoid further disturbance to Liboron's fragile ecosystems. While almost all of the Old Liboron households were relocated to Palo Cinco, five households opted to move to Tonggo, in the municipality of Tudela. Old Liboron is the site of the rainforestation nursery and has a reforestation area of approximately 330 hectares.

Lake Duminagat, found in the strict protection zone, has elevations ranging from 1,440 to 1,678 masl. and has a land area of 909 hectares. Sebucal, also found in the strict protection zone, is an interior barangay of the City of Oroquieta. It is called "the navel of Mount Malindang" as it lies below other barangays in the buffer and core zones, with an elevation of only 400-800 masl. It has a land area of 5,241 hactares (Sebucal PRA-CAFOD, 2000).

Discussion of Phase One Results

Initial activities during the first phase of the Project (August 2008-August 2009) included the setting up of the rainforestation nursery in Old Liboron to propagate approximately 120,000 seedlings and young trees of indigenous species. A bunkhouse was constructed near the site for meetings and to accommodate guests and the Project staff.

Forty hectares of near natural forest plantations were established inside the strict protection zone. Ten hectares of village forests were also established, or two hectares in each of the five barangays mentioned. The village forests were initially planted to rubber and falcata, but due to the high mortality rate of rubber, it was replaced with abaca. There is ample space for villagers to plant vegetables and other annual crops for their own consumption.

Against this background, this paper focuses on the initial socioeconomic effects of the on-going rainforestration project in the MMRNP which covers the buffer and strict protection zones. It outlines the socioeconomic and demographic data and access to social services of Park residents for the period September 2008 to August 2009.

Socioeconomic and demographic Data

As of August 2009, the situs of the Rainforestation Project has a total population of 1,754 distributed in 355 households located in five barangays: 58 in Sebucal, 132 in Mansawan, 68 in Gandawan, 65 in Lake Duminagat, and 32 in New Liboron. Except for Gandawan, the Subanen predominate. About 93.8% are found in Lake Duminagat. More Bisaya and mixed population are found in Gandawan. (Appendix 1.)

The family size is relatively higher in Sebucal and Mansawan, or an average of five children per family. The typical Gandawan family has an average of four to five children while families in Lake Duminagat and New Liboron register two to three average number of children. Between the core zone communities, Lake Duminagat has more households than the less accessible Sebucal, yet its average number of children is lesser. Lake Duminagat residents account that the cold weather condition of their place – an average of 15° Celsius and reaching a low of 12° Celsius during rainy days – pose a risk to the survival of the newborn, given their make-shift dwellings that afford them poor protection from the elements. They say that they usually bring the "puya" (newborn) to the adjacent lowland municipality of Mutia for a few months. On the other hand, there may be unmet family planning needs in Sebucal, Mansawan and Gandawan.

The Park displays the classic case of convergence of low income people and natural forests (Sunderlin, Angelsen, et. al., 2005; Johns and Maundu, 2006). Sebucal and New Liboron households engaged in

farming invariably report incomes averaging P1,500 a month. The Biodiversity Research Programme (BRP) earlier reported average monthly incomes in Mansawan, Gandawan and Duminagat to be P4,350, P2,357 and P2,060, respectively (Roxas, Poblete, et.al., 2005). Residents in these three communities claimed nothing much has changed in their income status since the BRP period. Average monthly income of Mansawan households is higher due to their easier access to the Poblacion and the engagement of some in non-farm activities (i.e., sari-sari stores). Gandawan and Lake Duminagat households generally only do farming and have difficulty transporting their produce to the centro (Mansawan) and then to the Poblacion.

Access to Social Services

Education. Educational opportunities of the residents in the five barangays vary. Among the five areas, getting an elementary education is the most common while getting a college education is limited and difficult. Most residents of New Liboron, or 86.84%, only have elementary education, with an additional 10.53% who finish the elementary grades. In Sebucal, only one percent finished elementary although 74% has had three to five years of elementary education. In contrast, the more accessible barangays of Mansawan, Lake Duminagat and Gandawan have higher percentages of residents with high school, or 33.52%, 27.61% and 25%, respectively, with the highest percentage of those from Gandawan who finished high school. A high school facility is available in Mansawan; meanwhile, most Gandawan residents are Bisaya who have relatives in the lowlands and therefore had better chances of finishing high school.

Pursuing college education is a higher need in a population whose access to it is limited. Higher education institutions cluster in Oroquieta or Ozamiz City. Only a few families can afford the cost as gleaned from only a few cases who obtained college education in Duminagat (6.13%), Gandawan (5.23%) and Sebucal (1.79%). However, improvement in the economic condition of households due to the rainforestation project may bring about positive alterations in the distribution of the population toward the higher educational brackets as key informants expressed that the increase in their income had resulted in their being able to plan for the schooling of their children. This is expected to improve the

population's capability to achieve socioeconomic and environmental awareness, values and skills consistent with sustainable development goals.

Access to Electricity. The main source of electricity of the five barangays is solar energy, except for Sebucal which has a mini-hydroelectric facility. The installation of these solar energy sources were post-BRP accomplishments, a voluntary effort of a group of Mt. Malindang trekkers from the Adventist Community Services, led by Engr. Roy Arguillano, in 2007. The local government units in the Park shouldered materials used in the installation. The cost of electrical connection for households is P500 and the battery charging per household is P20/charge, enough to light one bulb for a month. Listening to the radio for a few hours a day would require at least three battery charging a month. Gandawan and New Liboron have the highest number of households having electrical connections, or 89.71% and 84.38%, respectively. Only 52.30% of the households in Lake Duminagat and 31.81% in Mansawan have electricity, the former owing to the more impoverished condition of households, the latter due to the smaller solar energy output vis-à-vis the large number of households.

The mini-hydroelectric plant in Sebucal along the Panubigon Creek, a tributary of the Layawan River, provides the cheapest source of power in the Park, or a flat rate of only P5.00/ month, resulting in 90% of the Sebucal households having electricity. As of this writing, a mini-hydroelectric facility is being constructed in the nursery site to provide lighting there.

Access to Safe Water. All households in the four communities in the Park, except for those in Sebucal, have access to potable water. As a result of the sparse geographic distribution of a few houses in Sebucal, 10% of residents are unable to avail themselves of the barangay water system.

Also, as of this writing, the rainforestation nursery workers could already access safe water due to the installation of a hydraulic ram pump in the nursery site and Engr. Arguillano's team is credited for this. The Protected Area Superintendent reported the drastic decline in the incidence of diarrhea among nursery workers since the installation of the ram pump.

Durable Items Owned

An inventory of durable items owned by local residents show that modern means of communication like the radio and mobile phones are common. Focus group discussions (FGDs) reveal that income from the rainforestation project has allowed a number of households to purchase radios and are happy to be "in touch" with the world outside Mt. Malindang. A few household heads also plan to purchase mobile phones. The possession of a sing-along/karaoke for entertainment by 10 households in the Park was also noted. Taking stock of the recent ownership of durable items and plans for new purchases is a good indicator to measure socioeconomic improvement of local households.

Gender Differentiation

Reproductive roles differ for men and women, but the differentiation is not rigid in many reproductive activities: in managing the household, in resource extraction, in farming, and in selling the harvest. Men, however, generally do tasks which require greater physical strength.

Findings show that childcare and food preparation are still under the domain of women while construction and house repair are associated with men. Men and women both wash clothes, clean, purchase home and farm needs, feed domestic animals, fetch water, and gather firewood. Men take charge in the farming of cash crops, while the women in the growing of rootcrops and vegetables for the family's own consumption. Women are increasingly active in the selling of produce to secure proceeds and to better meet food and household needs. Men on the other hand, reportedly divert sizable amounts of the income for cigarettes and liquor.

Direct observation and key informants reveal that while basically there is a pattern of egalitarianism emerging in accessing political resources and benefits, control of community infrastructure, projects, and information remain in the hands of men. Prestige and recognition, therefore, are generally afforded to men. Accessing political position is also dominated by men. Women, nevertheless, are empowered when it comes to controlling the meager income of the family.

Appendix 2 shows gender differentiation which is specific to Sebucal residents. Findings are similar to that of the other Park

communities. Note that controlling land is marked not applicable since the residents do not have titles to their lands, the Park being owned by the government.

Financial/Economic Consequences of the Rainforestation Project for the Barangays

Employment Generation. The gathering and growing of wildlings/seedlings in the nursery, and the replanting and nurturing of the seedlings in the forest plantation and village forests provide employment to the local people. Hiring is on a 15-day rotation basis, with 30 – 32 workers per batch. The participatory nature of the project is evident in the barangay officials' authority to hire workers based on the outcome of community consultations. Those hired were required to attend an orientation on the rainforestation project and on the nature of their work assignment.

A total of 407 Mt. Malindang residents – 404 from the buffer and strict protection zone communities and three (3) from the neighboring community of Tonggo – have already been hired and paid PhP150/day from September 2008 till end of August, 2009, resulting in a total wage bill of PhP1,822, 500. Appendix 1 shows the number of persons hired per barangay. Men and women are given equal employment opportunity, but only one per household could be hired for each rotation. However, only about 11% of the workers are women, as many prefer to tend to their children, and to household chores and gardening, content that their men have found employment in the project.

Around 90-95% of the households in the buffer zones have at least a member hired in the project. Comparing the number of households against the number of workers hired, it can be inferred from Appendix 1 that more than one household member has been hired for the project in Sebucal and in Gandawan, more than two in New Liboron, but less than one in Mansawan. Mansawan is the farthest barangay from the project site and other livelihood opportunities in the project become unattractive to some.

Total man-days rendered from September 2008 to August 2009 reached 12,150. Workers from New Liboron rendered the highest number

of man-days (3357), a privilege given to them as they are the relocatees from the nursery site (Appendix 1).

The number of days work ranged from 2 days to 262 days, the former obtained by those who served only as porters of nursery construction materials from Mansawan to Old Liboron, the latter rendered by one of the core leaders of the nursery workers, and as such was hired continuously during the period studied. Those observed to have excellent work attitude and outstanding working relations with peers became part of the core group, allowing them practically continuous employment in the project. Nursery leaders were chosen by the Project Staff composed of the Protected Area Superintendent and employees of the PAMB. Community workers who displayed an unlikeable attitude were not given another chance in succeeding rotations.

Income Generation. On the household level where most household heads claimed only around P1,500- P4,350 income from on-farm activities, the increases in income owing to employment in the project reportedly ranged from 20% to a high of 200% for the September 2008 – August 2009 period.

On a macro-level, the income infusion to the communities for the services rendered by their respective workers is quite significant *vis-à-vis* low community incomes before the rainforestation: P346,050 for Sebucal, P355,050 for Mansawan, P261,450 for Gandawan, P312,750 for Duminagat, and P503,550 for New Liboron. This has stimulated the local economy as more purchases of basic needs from local stores are now taking place. Local stores now sell more rice as many households are already able to include rice in their meals. Fish vendors from the lowlands have also been frequenting Mansawan as fish is becoming part of the diet of households. The improved diet is expected to have positive consequences on the health of Park residents.

Provisions for Sustainable Development and Project Maintenance

Efforts toward the sustainable management of the reforested sites and village forests, as well as the protection of the old-growth forests for a period of at least 30 years are in place, and these are funded. Eighty percent of the maintenance funds for the first year went to the establishment of vermiculture and 20% for scholarship grants.

Vermiculture. The Provincial Environment and Natural Resources Officer trained the project workers in vermiculture and how it could sustainably provide organic fertilizers to the nursery seedlings, the village forests, and to farms and home gardens. Increases in the survival rate of seedlings and farm/garden yields have been reported, as a result. To ensure a robust harvest of vermicast, goat-raising is done near the nursery as a source of animal manure which is required in vermiculture. Goat's milk is expected to be another source of nourishment and income to Park residents.

Scholarship Grants. Fernando Rebicoy, Jr. of Gandawan and Ryan Pata of Lake Duminagat are both beneficiaries of a two-year Forestry Technology scholarship at the Mindanao State University Lopez Jaena campus. Additional scholarships of a similar nature shall be granted to qualified local youth as the rainforestation project progresses. Three new grants have been given for SY 2010-2011. The scholarship contracts cite the role of the grantees in ensuring the sustainability of environmental and biodiversity management in the Mt. Malindang Range Natural Park long after the rainforestation project would end.

Conclusion

The rainforestation project has allowed almost all the buffer and strict protection zone households to gain access to another income source. Food diets have improved, to include rice and fish, with positive implications on the health of residents. Moreover, a vibrant local economy is emerging due to the increased incomes of households. Scholarship grants toward sustainable forest management provide empowerment for the eventual management of the Park mainly by its residents.

Park residents expressed hopes for an improved quality of life through the sustainable livelihood that the project engenders. With the project addressing not only environmental issues in the Park but also the general well-being of its residents, a new hope emerges among stakeholders that long-lasting outcomes towards biodiversity conservation and livelihood security can be achieved.

Recommendations

Based on initial findings, the socioeconomic monitoring team recommends the following:

1. To put in place mechanisms for knowledge management to ensure provision of inputs for appropriate decision and policy making that will lead to sustained improvements in the well-being of Park residents. A good starting point is for the LGUs administering the Park from the barangay level to monitor the documentation of pertinent socioeconomic data in the Park such as population changes, health and nutrition, and education.

2. To further augment income and ensure forest protection, it would be best if trainings on alternative livelihood would be conducted for men and women in both the buffer and strict protection zones. The BRP includes in its recommendations the production of honey and spices, and the use of indigenous materials for handicraft, among others.

3. To promote and organize multipurpose cooperatives in the Park, particularly coops that supply basic commodities, including rice and fish, and ensure their availability at reasonable prices, too.

4. To create a scheme of payment for environmental services for the sustained and efficient provision of water to communities dependent on the Park's watershed. The concerned LGUs, in partnership with other Park stakeholders, can use this both as a conservation measure and revenue-generating activity, with portions of the revenues going to the Park residents as incentive for protecting the watershed.

5. To develop Information, Education and Communications (IEC) materials in English and in the vernacular that deal with the rainforestation's best practices for others to emulate; and, to

generate linkages and support towards ensuring the rainforestation project's sustainability.

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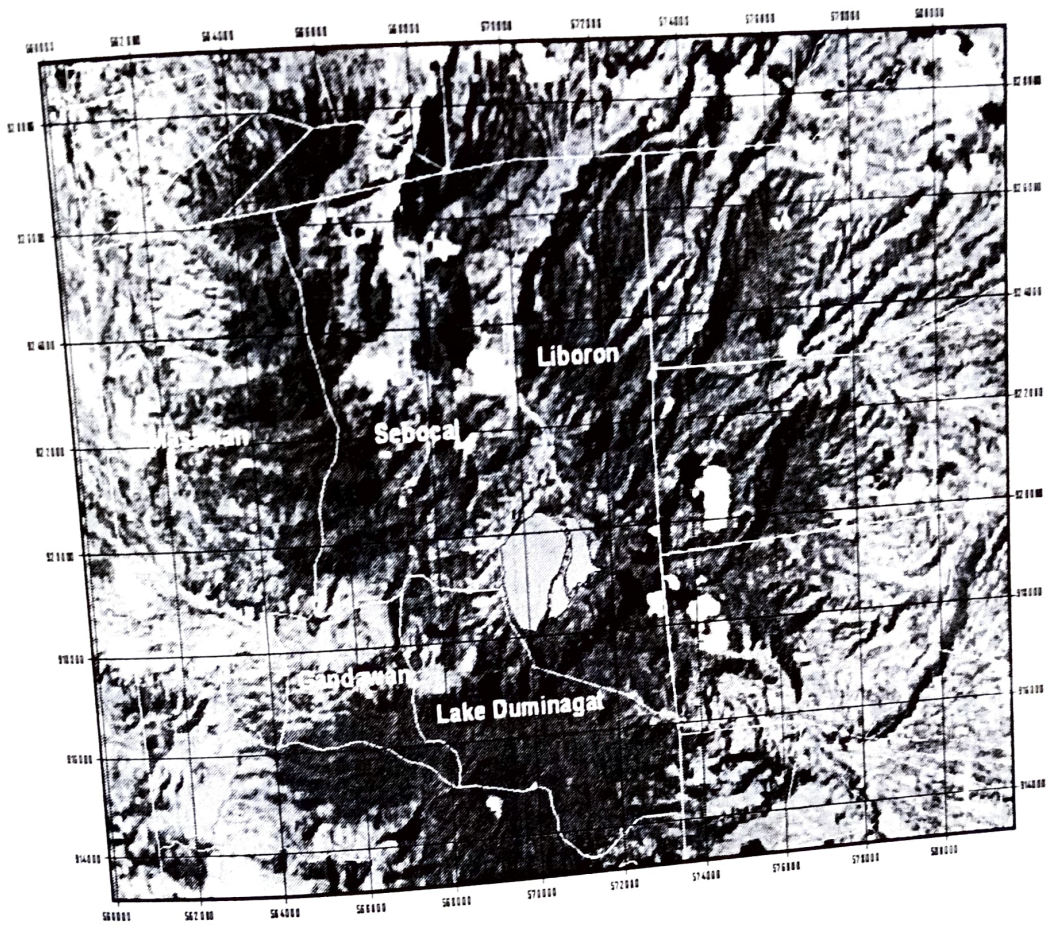
Appendix 1. THE RESEARCH SITES

Rainforestation Project in Mt. Malindang Range, Misamis Occidental, Philippines



Appendix 2. MONITORING EVALUATION MATRIX
Reforestation Project in Mt. Malindang Range, Misamis Occidental, Philippines
September 2008 – August 2009

	Sebucal	Mansawan	Gandawan	Duminagat	New Liboron
A. Socio-Demographic Data					
1. Total Population	290	550	484	290	144
2. No. of Households	58	132	68	65	32
3. Ethnicity					
a. Subanen	72.40%	77.52%	15.38%	93.85%	94.37%
b. Bisaya	27.60%	12.65	43.59%	3.08%	2.11%
c. Mixed	-	15.69%	41.02%	3.08%	-
4. Average No. of Children	5	5	4-5	2-3	2-3
B. Access to Social Services					
1. Education					
With elementary school	74%	30.14%	64.18%	66.98%	86.84%
Elementary graduates	1%	38.51%	2.99%	1.42%	10.53%
With high school	21.21%	23.94%	13.43%	23.58%	2.63%
High school graduates	2%	9.58%	14.18%	1.42%	
With college education	1.79%		2.24%	5.19%	
College graduates			2.99%	0.94%	
2. Access to Electricity					
a. No. of HHs with electricity	52 (90%)	42 (31.81%)	61 (89.71%)	34 (52.30%)	27 (84.38%)
3. Access to Safe Water					
a. No. of HHs with access to Safe Water	52 (90%)	132 (100%)	68 (100%)	65 (100%)	32 (100%)

C. Economic Data					
1. No. of employed persons (on-farm)	40	35	36	19	59
2. Monthly income	P1,500	P4,350	P2,357	P2,060	P 2,250
3. Daily income	<PhP50	PhP40-50	PhP40-50	PhP40-50	<PhP40-50
4. Durable items owned					
a. Households w/ Radio	10	5	19	9	8
b. Cellphone		6	17	12	4
c. Sing-along			6	2	2
d. Sala set		1	5	2	
e. Others		1	9	7	
D. Impact of Rainforestation Project					
1. Increase in Population	None	2	None	None	None
2. Livelihood Generated	Project workers	Project workers	Project workers	Project workers	Project workers
3. No. of workers hired	82	92	77	74	79
4. Ratio of number of households to number of workers hired	1 : 1.50	1 : 0.70	1 : 1.13	1 : 1.14	1 : 2.47
5. Total no. of working days	2307	2367	1743	2085	3357
7. Range of working days	2 - 262	1 -201	3 -176	3 - 147	2 – 194
8. Daily wage of residents hired in project	PhP150	PhP150	PhP150	PhP150	PhP150
9. Additional community income due to project	PhP346,050	PhP355,050	PhP261,450	PhP312,750	PhP503,550

Appendix 3. Gender Data (Sebucal)

Activity Profile: Checklist of the Reproductive Activities (Sebucal)

Reproductive	Men	Women
Reproductive Activities		
1. Childcare		/
2. Home maintenance	/	
3. Food preparation		/
4. Fuel related (gathering firewood)	/	/
5. Washing of Clothes	/	/
6. Cleaning	/	/
7. Market related	/	/
a. farm needs		
b. home needs		
8. Feeding the Domestic Animals	/	/
9. Fetching Water	/	/
Total	7	8

Legend: /- presence

Gender Access and Control (Sebucal)

Resources	Access: Men	Access: Women	Control: Men	Control: Women
Political				
1. W/in the house (decision making on no. of children etc.	/	/	/	/
2. Outside the house:	/	/	/	/
a. Pol. position in purok/brgy	/			
b. land management				
c. infra/com. projects	/	/	N/A	N/A
d. information	/	/	/	
e. contact w/ outsiders (NGOs/POs)	/ /	/ /	/	
Benefits				
1. Income		/		/
2. Clothing		/		/
3. Training/knowledge/ skills	/	/	/	/
4. Prestige/Recognition	/		/	

Legend: /- presence

Access:		Control:	
Men	= 9	Men	= 6
Women	= 9	Women	= 5

Appendix 4. PHOTO DOCUMENTATION

The Socioeconomic Monitoring Team pose at the entrance of the Mansawan Village Forest in April 2009.