

INSTITUTE OF CURRENT WORLD AFFAIRS

DGD - 3  
Forestry developments in the Philippines

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Dear Peter,

When our pilot stuttered something about anticipating a little roughness on our descent into Manila due to a recent low pressure condition in the area, I began to expect some excitement. Apparently our flight arrived during the last throes of a typhoon. Eyeing the broken banana palms as I waded to my taxi in the blowing rain at the airport, I was relieved to know that the worst of the storm had passed.

The weather soon cleared to daily thunder showers which I took in stride. Initially I sought to make the acquaintance of a friend of a colleague at Berkeley, Oscar Gendrano, Executive Forester and Executive Officer of the Philippine Chamber of Wood Industries. Oscar very generously provided me with information on forestry in the Philippines as well as a tour of the College of Forestry and the Botanical Gardens at Los Banos. Auspiciously my visit coincided with the convening of the First Philippine Forestry Congress in Manila. With Oscar's assistance I was able to locate at this conference several individuals with whom I discussed various forestry programs and issues in the Philippines.

One such item of interest is the government's proposal to support rural electrification with several wood-fueled power plants. With regard to this program I spoke with P.V. Bawagan of the Forest Products Research and Industries Development Commission (FORPRIDECOM) of the National Science Development Board. It seems that as a consequence of the 1973 energy crisis FORPRIDECOM was assigned the task of determining the feasibility of using natural or plantation forests to provide fuel for generating electricity. After a survey of several Philippine wood industries which produce steam for use in wood processing and in the production of electrical power, the National Power Corporation decided the minimum economic size of a central steam power plant to be 75 megawatts (Mw). Additional calculations showed that a plant of this size would require approximately 434,000 bone dry metric tons (bdt) of wood per year. Given the cost of fuel oil, the energy production capacity of wood and the cost of wood transport, they estimate further that 50 kilometers would be the maximum economically feasible hauling distance for wood fuel.

Although the aggregate quantity of wood waste from Philippine logging and wood processing operations is considerable, it was determined that there is no single location where the desired quantity of wood refuse is presently available. Moreover the increasing utilization of wood waste by industry for pulp and energy production could be expected to reduce future supplies.

A more stable source of supply could be tree farms or plantations of fast-growing tree species. It was calculated that at the observed growth rates of several of these species, it would take approximately 50,000 hectares of Eucalyptus deglupta, 42,000 hectares of Albizia falcataria, 38,000 hectares of either Gmelina arborea or Anthocephalus chinensis or 9,000 hectares of Leucaena leucocephala to provide the annual quantity of wood necessary to fuel a 75 Mw power plant. Given the constraints on hauling distance, minimum plantation requirements, cooling water requirements and available government reforestation areas, the FORPRIDECOM study identified 25 potential energy plantation sites with a total area of approximately 320,000 hectares capable of supporting 19 wood-fired power plants with an overall generating capacity of 1425 Mw. According to the official report a wood-fired electrical generating plant could not only compete economically with an oil-fired plant but also generate an estimated net foreign exchange savings of approximately U.S.\$ 146 million in the first ten years of operation.

The government's first energy forest of L. leucocephala was planted early this year. Bawagan reported that they plan to manage the Leucaena on a coppice system whereby the tree will be cut at three to four year intervals and the stump allowed to resprout. He admitted their uncertainty as to how long the vigor of the plant can be maintained under this system and therefore when replanting would be necessary. Leucaena leucocephala has exhibited growth rates from 12.6 bdt to 149.5 bdt per hectare under various conditions. According to R. Baggayan, Chief of Reforestation and Afforestation of the Bureau of Forest Development, L. leucocephala does best in an agro-forestry context, that is, in tilled soils. This contrasts somewhat with the description of the proposed energy plantation sites, specifically, government reserve areas deemed unsuitable for agriculture or annual grazing. It will be interesting to note if the government gets the expected and required wood quantities from its fuel forests.

The final recipient of this wood, the wood-fired boiler generator, is reportedly still on the drawing boards. Although this pilot dendro-thermal plant is ostensibly for rural electrification, it is likely that the electricity generated will be turned into the national grid and swallowed by urban consumers unless the rural power distribution network is expanded as well. In addition to supplying fuelwood the Leucaena plantation could provide fodder and green manure. Bawagan said that no plans had been made to exploit this potential of the energy forests.

The idea of wood-fueled power generation is only one of several alternative energy production technologies which the Philippine

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1/ Semana, J.A., P.V. Bawagan, F.R. Siriban and V.E. Mendoza. 1977. A Feasibility Study of the Utilization of Man-Made Forests for Generating Electricity. Forest Products Research and Industries Development Commission. National Science Development Board, College, Laguna.

government is investigating. Biogas, i.e., methane production from livestock wastes, has received substantial publicity. During my visit I observed a newspaper article extolling the virtues of a liquid fuel derived from coconuts. One hopes the extensive experimentation with new technology is conducted with sufficient preparation and technical support. Poorly organized field trials risk not only an inadequate assessment of the technology but also skepticism and alienation in the rural population. Such attitudes only hinder the development process.

Generally speaking fuel scarcity is not reported to be a major problem in the Philippines. Wood is still plentiful in most areas and commonly used for cooking and heating. Only in some rice-producing regions has a shortage of wood forced the utilization of rice chaff as cooking fuel. Charcoal, largely produced from mill and logging residues at the site, is an inexpensive and, according to Bawagan, highly underrated fuel. More efficient kilns could produce a better charcoal with which improved packaging could resist destruction in transport. He argued, moreover, that a better designed cooking stove could improve greatly the energy efficiency of charcoal fuels. Bawagan admitted that his previous efforts to promote a more efficient stove design had been unsuccessful partly because of the failure to involve the consumer, i.e., the housewife and cook, in the design process. We discussed the fact that in advocating charcoal stoves, he faces much more than the issue of the energy efficiency or even the cost of the cooking fuel. The kitchen must be seen as a miniature food processing plant where the time and effort involved in the preparation of the food and the fire, the cooking and the clean-up are all important components in the efficiency calculations. The ease, and in some cases the prestige, of using a gas flame should not be underestimated.

Another aspect of Philippine forestry of particular interest to me is the agro-forestry program promoted by the Development Bank of the Philippines (DBP) with the assistance of the World Bank. With the overall goal of developing forestry at the rural community level this program, by encouraging and supporting the farmer to plant tree crops on his marginal agricultural land, seeks to assure a continuous supply of raw materials to local wood-using industry and to provide the farmer with an additional source of income. According to Greg Clemente, Technical Assistant of the Agricultural Projects Department, DBP, the various agro-forestry projects so sponsored are tied directly to local industry. Initially the company interested in participating in this program conducts a regional survey to determine those areas where it would be economically feasible to grow the desired tree crop. The farmers are then informed of the possibility of joining the project with the financial and technical assistance of the DBP and the participating local company.

Applicants for a loan under this program may be either individuals or groups of small landholders who intend to grow Albizzia falcataria, or similar fast-growing species, for pulpwood or Leucaena leucocephala for firewood, charcoal or leafmeal production. Except for those who engage in the production of firewood in the Ilocos region, all borrowers must enter into a marketing agreement with the local participating company. Under limits set by the World Bank the maximum area which

can be financed is 25 hectares for an individual and 50 hectares for a group. According to Clemente the median size of holding financed under this program is 10 to 15 hectares. Under a ceiling of ₱ 2000 <sup>2/</sup> the amount of the loan will vary depending on the scale and type of project and the borrower's need; additional funds are available if interplanting with agricultural crops is undertaken. All borrowers are required to contribute at least 10 percent of the total investment cost in the form of family labor. Interest rates are 12 or 14 percent per annum for loans secured by land or against the assignment of rights on the project site or other chattel. For Albizzia, loans are payable in 14 years including a grace period of 7 years; loans for leafmeal production are payable in 2 years whereas those for wood fuel are payable in 8 years including a grace period of 4 years.

It is estimated that with A. falcataria coppice on a four year rotation the farmer can remove in thinings 50 cubic meters per hectare at age four and return four years later for a complete harvest of 250 cubic meters per hectare. At the local company's roadside price of ₱ 60 per cubic meter the revenues amount to ₱ 3000 per hectare at year 4 and ₱ 15,000 at year 8. The interest on the farmer's loan is due in year 9, however, and eats up most of the income from the first harvest. After repayment of the loan the net present value of the income stream over two rotations calculates to approximately one-sixth of the face value of the gross revenue over this period. Given that the life span of the average Asian peasant is estimated at about 40 years, one must surmise that for the farmer the real present net worth of that income received sixteen years hence must be much less.

The individual agro-forestry project which lately has received some publicity is that of the Paper Industries Corporation of the Philippines (PICOP) in eastern Mindanao. PICOP representatives reportedly train the farmers in proper site preparation, tree planting and maintenance. Additionally the company offers instruction in improved agricultural techniques and health care and distributes livestock and seeds, encouraging interplanting of food crops, such as, rice, corn and sweet potatoes, among the young trees. Through a marketing agreement with the farmers, PICOP buys all the A. falcataria pulpwood that the farmers can grow. Although this scheme indeed has provided some small farmers with a new cash crop with an insured market, I wonder if over time the farmer will be treated fairly in this potentially abusive monopsonistic situation. As forest acreage decreases and the world's demand for pulp increases the price of pulpwood should rise. Will the Philippine tree farmers be able to participate in this windfall? Furthermore, I question the availability of surplus labor needed to support these projects. Baggayan mentioned that one of the big stumbling blocks in the government's reforestation program is a shortage of labor precisely when they need it most, that is, during the planting season. ^

No doubt an added objective of the government in promoting agro-forestry programs is the stabilization of the shifting cultivator. By distributing improved genetic plant and animal stocks and instructing the farmer in better agricultural and silvicultural practices, government and industry can improve the productivity of small agricultural

holdings. Thus they hope to break the cycle of impoverishment and abandonment of farm land and the encroachment of forest land.

The actual condition of the Philippine forest resource is a subject of controversy in Manila and elsewhere. Diverse statistics from those developed from satellite imagery to those issued by official government sources give the forest cover variously as from 20 to 50 percent of national land area. Likewise, the quoted annual rates of deforestation range widely from 80,000 to 204,000 hectares. The blame for these losses goes to several activities, including improper logging, shifting cultivation and illegal land settlement. Some argue that the settlers are professional squatters organized by land speculators who occupy land originally dedicated by the government to permanent forests for soil protection or forest products and then through political pressure force the government to release the forest land to supposedly landless peasants. Although the government reports to have increased reforestation from a pre-1976 average annual rate of 9000 hectares to 110,000 hectares in 1977, other groups claim that these are only paper victories. More precisely, when actually examined in the field many of the so-called reforested areas do not appear adequately stocked with living, vigorous trees.

The rising demand for forest products on the one hand and the environmental disasters which have resulted from forest land mismanagement on the other have not gone unheeded by the Philippine government. The Philippine leaders are well aware of the importance of conserving and enhancing the nation's forest resources. Recognizing that the efforts of the past decade have been insufficient to insure a green future, the government launched the Program for Forest Ecosystem Management (ProFEM) in July 1976. The stated objectives of the program are to restore adequate forest cover on critically denuded watersheds, establish forest plantations to supply raw material for existing and additional wood-based industries, encourage the development of parks and municipal forests for recreation, beautify major roadways, encourage greater public knowledge and participation in the production of food and wood and create employment opportunities. In the implementation of this program ProFEM Councils have been organized in every province and municipality. In order to cope with the seedling requirements local governments and schools have been required to establish nurseries and seed storage facilities. Students and government employees are required to collect and submit seeds of fruit-bearing or forest trees. In addition the government plans to expand its efforts in silvicultural research, forestry training and extension services and public environmental education programs. Evidence of the media campaign materialized in my room daily in the form of a newspaper serial strip which illustrated the carbon cycle and discussed the role of the forests in maintaining a healthy environment.

In the following year on June 6, 1977, President Marcos issued Presidential Decree no. 1153, otherwise known as the Tree Planting Decree. This presidential order obliges every Philippine citizen between the ages of 10 and 65 to plant one tree every month for 5 consecutive years for a total of 60 trees. According to Baggayan, Chief of Reforestation and Afforestation, individuals may comply with civic duty by planting seeds in containers at home and delivering the

healthy seedlings to local forestry officials. In other instances planting parties of students or neighborhood groups are supplied with seedlings and transported to designated reforestation areas. No doubt encouraging seed collection and planting by the general public is very useful in improving citizen awareness of environmental problems and knowledge of arboriculture but I think such a schema may have dubious silvicultural benefits. Negative genetic selection and poor seed viability are two possible hazards. A similar program in Korea resulted in seed collection from inferior tree specimens, in particular from those stunted trees whose seeds were easily accessible.

Also initiated under ProFEM was the Family Approach Reforestation Program. In this scheme families residing within or near forest areas are contracted by the government to plant designated open or denuded forest lands and to maintain and protect these new plantations for two years or until a survival rate of 80 percent of the seedlings is achieved. During the custodian period the family is encouraged to interplant with food crops. After the young trees are established the plantation is ceded to the government which in turn employs local people in the construction of forest roads, trails and firebreaks. Forestry project managers throughout the Philippines stress the urgent necessity of constructing better road systems for a more effective implementation of various reforestation activities.

The Philippine leaders' recognition and highlighting of forestry problems and the subsequent reorientation of government planning efforts are most commendable. The emerging programs meant to encourage reforestation and rural community development definitely deserve monitoring through the coming years. At the present time, however, I believe that it is too early to evaluate the successes of this new campaign. The new projects are barely visible in the glare of the publicity. Forestry officials with whom I spoke were perhaps too confident. At this stage a cautious optimism might be more appropriate.

My visit to the Philippines was an all too brief five days. The information which I have gathered and summarized above provides an outline of what is supposed to happen with a few comments as to what might happen. Certainly I look forward to returning to the Philippines in a few years to visit the various forestry projects and to talk with the foresters and farmers who currently are planting the fast-growing species, the "wonder" trees that purportedly will save the future of forestry and man.

Sincerely,



Deanna G. Donovan  
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