

Forest management on Java in the development era

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I Introduction

As far back and along the path of its history, among the \pm 4000 islands found in Indonesia, the island of Java has held the forefront role in determining the colour and movement of national development.

In addition to becoming the centre of governmental and political activities, the island of Java also has been the centre of national economic transactions and the main habitat for the majority of the Indonesian population, which is striving for a secure, tranquil and prosperous life.

Today, approximately 60% of the total Indonesian population, constituting 74.7 million persons, lives on Java, which has an extent of 132,000 km², implying an average population density of 568 persons per square km.

The fertility of the soil on Java, almost non-existent in the other islands, has become the source of attraction and hope, making the island of Java seem to be the only place where happiness and prosperity would be found. This turn resulted in the process of greater population concentration on Java, beyond the bearing capacity of the existing soil.

Moreover, the forest area on Java has reached a relatively minimal extent of only 2,988,222 ha, comprising 23% of the inland area, having no longer an optimal geographical distribution and vegetation condition.

The need of the people for forest product, mainly wood, fire wood, charcoal and leaves has reached proportions beyond the capacity and potentials of the existing forests. Forest disturbance in the form of forest products thefts, forest land expropriations, unauthorized cattle grazing, grass cuttings, forest fires and illegal hunting, have been increasing continually. Efforts on reforestation and replanting have met numerous obstructions. All these have negatively affected the environmental condition. The deterioration of the environment has disturbed the water balance, resulting in floods and land erosion and losses of material and life, harvest failures of agricultural crops, disturbances of fishery activities

and other damaging consequences. The capacity of nature to serve people living on Java has become ever more limited. Thus, if technology does not grow and the techniques of processing are not speedily enhanced, the sources of living will become even more reduced and the forest will constantly become the object for compensating the deficiencies of the needs of the population in the forest vicinity.

II Forest management in the past

In the period before World War II, the problem of the population on Java of \pm 35 million persons was relatively not yet burdensome, while the forest area was still quite extensive and its condition was still relatively intact. The needs for forest yields could still be accommodated, the agricultural land was still adequate and quite fertile, problems attributed to floods and erosion were still limited. Also the political, socio-economic problems and forest disturbances had not been too complex. This had made possible the application of forest management, wholly on the basis of the principles of forestry techniques.

1 Policies

In the past, the set of policies on forest management, was practically not yet concerned with considerations related to problems at the national, regional and cross-sectoral levels as well as to socio-economic aspects.

The policies undertaken were more concerned with internal problems and were very rarely engaged in administering the interests of the nearby communities. This is evident from the plans of that time, in which forests seem to have been treated as an independent unit, with the sole aim to produce wood and/or other forest products.

2 Planning

The problems in forestry at that time were still restricted to technical routine matters, covering such

aspects as planting, tending, logging and infrastructure.

Thereby, the formulation of plans could specifically be focussed on activities on forest administration, such as making forest boundary lines, forest classification, forest inventory taking, measurement and mapping of forests and forest infrastructural works, which were subsequently contained in the Work Plan, which was basically only aimed at preserving wood production.

The administrative activities were more concentrated on teak forest areas, which covered 1,053,711 ha, with the aim of exploiting the high value teak timber. Administration of the non teak forests, however, covering an area of 2,018,450 ha had not yet been fully implemented, due to economic considerations.

Up to that time, plan formulations had been confined to the setting up of Work Plans for the teak forests, covering the fixed 10 years long term Work Plan, the 5 years provisional Work Plan, as well as the yearly Work Plan, which still had their weaknesses.

Even though at that time efforts had already been made towards the establishment of industrial forests as is shown in the compilation of the "Forest Industry" book by Van Monroy, in which various trees had been determined, estimated to have a potential to induce industrial growth in the prospective periods, yet the decision on the types of the trees had only been based on factors related to the plant growth potentials of sites, namely climate, soil and elevation and had been adjusted to the types of industrial plants which had been previously determined.

As the industrial projection had been based on estimates encompassing Indonesia as a whole, while the growth of the industries in the surrounding areas had not constituted a determining factor, the implementation of such industrial forest schemes had invariably involved the element of conversion to the already planted types of industrial trees.

III The current situation

The explosive population growth had henceforth brought about such problems as food supply, expansion of settlement areas, infrastructural availability, creation of employment opportunities, procurement of energy and other requirements.

Thereby the macro problems encountered in the construction era on Java, are:

** Population density and its high growth rate (2.4%);

** Greater population growth compared to the growth of employment opportunities;

** Agricultural imbalance in the economic structure;

** Limited natural resources.

Expansion of cultivated lands through deforestation must be averted as the existence of the forest is essential, in view of its vital functions through time.

Given the other necessary measures, aimed at reducing the population pressure, such as transmigration, family planning and so on, the basic problems encountered in Forestry are currently as follows:

** Forest areas may not be reduced, with respect to extent as well as quality, and the functions of the forest areas are to be restored and in fact increased.

** Production of food crops must be increased through various modifications of efforts on the multi-purpose functions of forests, with due account of the forest extent utilized as agricultural land.

** The forest protection function is to be increased from 23% to 30% by actively planting the lands outside the forest areas.

It is necessary through various approaches, to develop a system of forest administration, which could attain the aforementioned variety of aims, in which the forest could have a multi-purpose function.

The approach must constitute adaptive measures, oriented towards the view of utilizing the available resources in the form of forest to the furthest extent, in order to ensure the survival of mankind and to ensure the attainment of the prosperous society goal, with due account of the principles on forest administration and forestry. The forests on Java need to be developed in order to meet the needs of the population, increasing their prosperity as well as improving their living environment.

Thereby, the principles of forest management are currently no longer implemented on the basis of the conventional procedure and need to be developed in line with the needs of the relevant situation, in the form of a symbiotic policy pattern, in which not only conservation norms and economic principles are to be adhered to but also the principle on integration with the surrounding population must be followed. In order to implement the above mentioned tasks, dedicated foresters are required, having greater skills and attitude on forestry techniques, agricultural cultivation, animal husbandry, fisheries and so on, so that their task could be implemented in conformity with the needs of the relevant period.

IV The current approach to forest management

1 Policies

Government efforts, aimed at attaining the goal of a

just and prosperous society, materially as well as spiritually, follow the policies on the trilogy of development, namely:

- * Greater equity, comprising the 8 channels for attaining greater equity, among others clothing, food, housing, education, health, income, employment, business opportunities and opportunities to participate in development.

- * Economic growth of 7-8%;

- * National security and defense.

In line with the above pattern, policies on forest management on Java are directed at efforts to contribute to national development in the field of forestry through an integrated management approach, namely:

- ** Implementing activities on production Intensification and diversification, processing and marketing to meet the domestic needs in general, specifically to increase the supply of forest yields, as the basic materials of industries, aimed at exports, in the context of increasing foreign exchange earnings and expanding employment opportunities.

- ** Increasing to the maximum, the social benefits of forests and forestry activities, in the form of internal measures as well as external activities, such as improving the water system, averting floods and erosion, carrying out prosperity approach measures, mainly for the population around the forests, preserving the fertility of agricultural lands, making available recreational sites, camping grounds and hiking facilities.

- ** Implementing integrated measures on forest conservation and maintenance of a balanced ecological system in all river basins on Java, in the context

of supporting measures to improve the living environment.

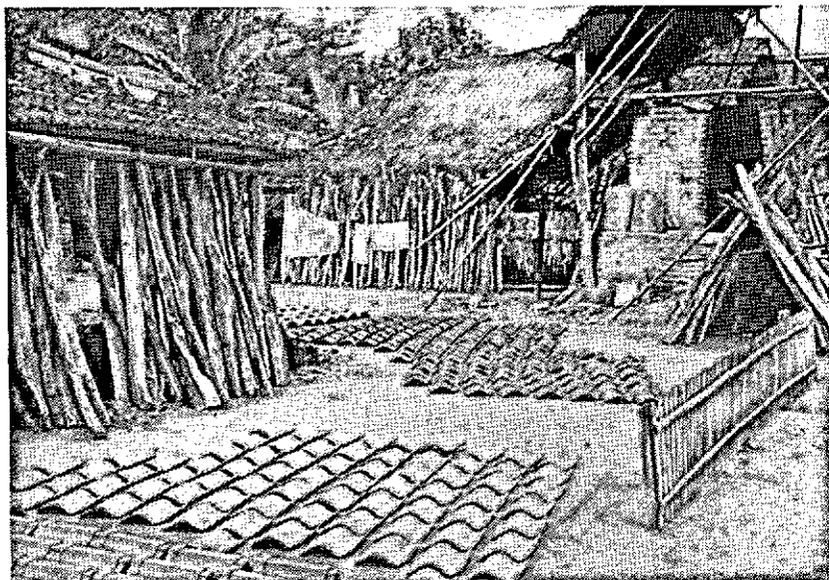
The above policies are contained in work programmes, which each year are constantly being developed and improved, covering various sectors of activities on planning, production, industry, marketing, technology, new projects, manpower, office administration, statistics and finance.

The aims of such policies are not only to quantitatively and qualitatively increase the achievements of the basic tasks on forestry, but also to participate in efforts to improve the social prosperity. From these it is expected that a favourable response would be induced, in the form of understanding, support and participation of the population with regard to the forests and forestry aspects, thereby making possible the realization of goals on forest conservation and ecological balance.

2 Planning

Planning is the entire process of idea development and thorough formulation of aspects or measures, to be taken in the coming periods, in the context of attaining a predetermined goal. As forest management policies involve the national interest, to be viewed not only from the standpoint of production aspects but also to be viewed from considerations on conservation and improvement of the living environment, it is necessary that planning today becomes dynamic, in conformity with the rate of environmental change.

As has become evident, the problems encountered are becoming more multi-complex, covering technical, political, economic aspects and problems



Much wood is needed for the manufacture of stones, tiles etc.
Photo: L. Oldenkamp.

on drought, floods, erosion, also problems related to technology. All these aspects need to be considered and formulated in the planning process.

Administration of non teak forests and teak forests, need to be intensified, in order to gain the optimum benefits from the existing forests. This implies that each KPH (Forest District) will have its work programme.

Forest management plans are devised to establish protected forest areas and wild-life preservation sites, which could improve their functions.

In encountering the aspects of technological and industrial development, specifically on the forest product industry, it is necessary to apply a "utility policy" scheme.

As a realization of such scheme, among others, a plan on Industrial Circle has been formulated, which constitutes a supporting area for industries, administered not on the basis of a Forest District but made in line with the production capacity of the existing industries. The differences between the industrial circle and the "industrial forest" as propounded by Van Monroy, are in the selection of the types of industries and planting sites, while account is also made of the needs of the existing industries. The existing trees are also utilized so that the conversion process does not always has to be made.

In order to surmount the hydro-orology problems, a Plan for the Development of river basin is formulated, integrated with activities on agriculture, irrigation, public works, animal husbandry and so on, normally referred to as the Integrated Area Development Scheme.

With regard to new activities, designed in the context of supporting environmental prosperity, project statements are compiled, such as the project statement on the multicropping mass intensification activities, cultivation of bees, planting of "elephant grass", medicinal plants, construction of base camps, check dams, water capturing installation, intensification of tumpangsari and establishing multi-purpose fish ponds and the project statement on the development of scenic forest sites, camping sites, cross-country facilities and wildlife conservation areas (Prosperity Approach project). Based on the 1975-2000 Master Plan on Forestry, the General 20 years Plan of Perum Perhutani has been formulated and subsequently specified into Five Years and Annual Work Plans for each unit, and into project statements, in conformity with the relevant type of activities.

Briefly, in this development era, planning activities have made significant progress, relatively to the preceding periods, in the context of supporting intensification and diversification activities of the

Enterprise. It has invariably been realized that as one of the essential elements in the management process, planning activities need to be continually improved, in order to formulate a working plan with a reliable forecasting capacity.

3 Production

Even though still following the system used before World War II, production activities, covering planting, tending and logging, have undergone many improvements and modifications, in the process of making adaptations to significant changes in the situation and in response to the continual growth of requirements.

The situation has changed considerably after World War II, in which a growing number of problems must be encountered, for which various measures are required to surmount all the aspects and impediments.

3.1 Reforestation

In the old days, reforestation efforts were not faced with numerous problems; the coverage of planting was restricted to the logged area, seeds and seedlings were available in abundance, environmental pressures were still limited and forest disturbances had been relatively insignificant, so that reforestation efforts were easily accomplished.

The multi-cropping system practiced at that time was more emphasized on economic considerations, specifically carrying out planting activities at a minimum cost. Even though at that time the income of the forest farmers had remained at a subsistence level, it had not resulted in a sensitive disturbance-prone situation.

Subsequently the situation has involved quite complex problems, as the planting works have not only encompassed logged over areas but also include quite extensive vacant lands, attributed to forest destructions in the transitional period.

In addition, population density and the social economic conditions of the population around the forests, had given rise to a continuing disturbance of the forest, on top of such problems as floods, erosion and drought. These had substantially impeded reforestation efforts.

In recognition of these problems, Perum Perhutani had endeavoured to take steps to surmount them. The measures have already been implemented since the beginning of this last decade, covering economic and socio-economic aspects, among others through:

- a The mass intensification of the multi-cropping system in the establishment of forest;
- b Speed-up and double speed-up of reforestation efforts to accelerate the solution to the very extensive vacant lands;
- c Enrichment planting at sparsely planted forests;
- d Implementation of the "Ma-Ma" system in the Malang and Magelang Forest Districts;
- e Spacing experiments.

Ad a Mass intensification of the multi-cropping system

The multi-cropping system for the cultivation of forest plants, using the *Leucaena glauca* as interplanting was introduced by Buurman at the beginning of the 19th century to Indonesia. The system is considered as not being in contradiction to silvicultural principles and is considered as having the lowest cost. It is still used to the present time.

In the past, the application of such system had put greater emphasis on economic considerations, namely the cultivation of forest land at a low cost. As a result the income of forest farmers had remained at a subsistence level.

Neglecting such a condition of the forest farmers is not only in contradiction with the aims of development to create a better standard of living but could also create a vulnerable situation with regard to forest conservation and security.

The current forest plants cultivation through the multi-crop system, must attain the following aims:

- * Creation of employment opportunities;
- * Increasing the standard of living of the population around the forests;

- * Cultivation of forest plants which can fulfill the functions based on economic, hydro-orological, aesthetical and other considerations.

The above measures are implemented, in addition to increasing the financing for plant cultivation. Also intensification of multi-crop system is implemented.

The intensification of the multi-crop system comprises the five farmer's basic activities, through the granting of credits and subsidy to forest farmers, in cooperation with other agencies, to implement the activities of:

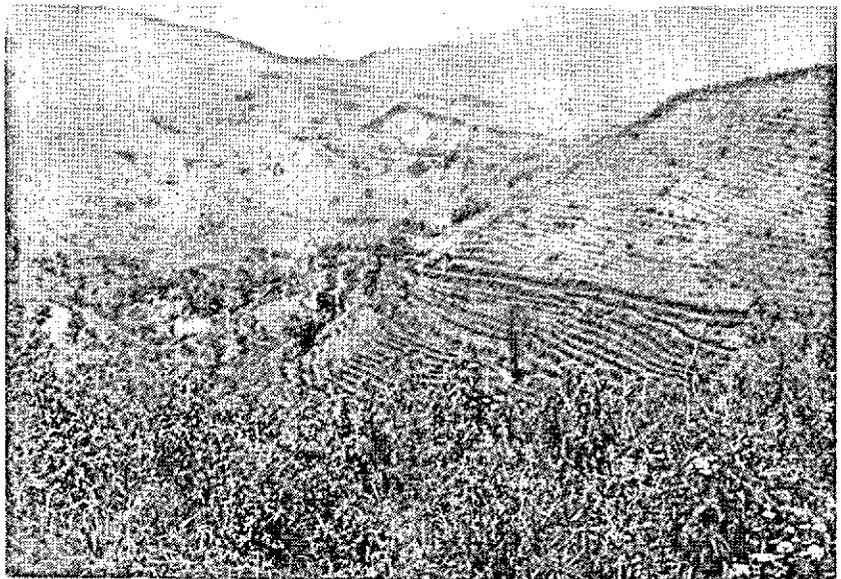
- * improved soil tillage;
- * planting of dry-land paddy and cash crops of superior seeds;
- * fertilizing with Urea and TSP;
- * eradication of plant insects and diseases, using insecticides and pesticides.

Through the intensification measures, the yield of dry-land paddy per ha, which originally had reached only ± 0.7 ton, could be increased to 2 to 3 tons and the growth of the main plant could be improved.

The mass intensification programme on the multicrop system has been well received by farmers and the population around the forest areas. Thereby this measure will continually be developed.

Ad b Speed-Up and Double Speed-Up of Reforestation Efforts.

As mentioned above, Perum Perhutani is faced with the obligation to immediately plant the extensive vacant lands. On these lands, the extent of the reforestation efforts must be increased each year, in order to gradually reduce and ultimately eliminate the vacant lands problem.



Forest area in mountainous regions on Java: few trees maintained.
Photo: L. Oldenkamp.

Even though reforestation efforts are carried out each year, covering a sufficient extent of areas, yet the vacant land coverage does not seem to be on a decrease and in fact is increasing.

Thereby, since 1974, speed-up efforts have been implemented to the reforestation programme and subsequently stepped up to a double speed-up of reforestation activities, in the context of endeavours to immediately settle the vacant land problem.

The speed-up and double speed-up of reforestation efforts, are implemented by:

- * greater annual increases of reforestation area coverage, using the multi-crop system, transplanting and the L.C.C. (Legume Cover Crop) system;
- * mobilization of funds, facilities and manpower;
- * increasing control and supervision of plant cultivation activities.

The L.C.C. (Legume Cover Crop) system, is the planting of leguminous species, such as *Callandra calothyrsus*, *Gliricidaeae* sp., *Leucaena glauca*, *Acacia villosa* and *Acacia auriculiformis* on vacant lands, aimed at the speedy covering of the soil. The plants are transitional plants, which could meet the hydro-ecological function and increase soil fertility. Later, the area could be planted with graded plants of the enterprise.

Through the speed-up and double speed-up reforestation efforts, it has been possible to complete the reforestation of the entire vacant lands of the Perum Perhutani areas in Central and East Java.

With the inclusion of West Java into the Perum Perhutani area since 1978, the concentration of reforestation efforts is now directed to West Java, which also has a quite extensive vacant land area. The activities in West Java are expected to be completed in 1981.

Ad c Enrichment planting

In the past, the condition of forest plants had been relatively intact and deficiently growing plants were very limited, so that in the case deficiently growing plants were found, speedy conversion into new plants could be implemented.

After the transitional periods, not only there are extensive vacant lands but also deficiently growing plants have become prevalent and this problem is meanwhile being handled through enrichment plantings.

Thus, in addition to the routine preservation efforts, measures have been taken to rehabilitate tens of thousands ha of deficiently growing plants through enrichment planting activities, which have absorbed quite a large amount of funds and manpower.

Enrichment planting is implemented by planting

types of plants, similar to the main plant type or other type as mixed plants, with the aim of increasing the teak as well as non teak forests potentials.

Ad d The Ma-Ma (Malang - Magelang) System

The Ma-Ma idea was initiated to surmount the specific problems found in the Malang and Magelang Forest District.

The specific problems concern the great need of the local population for agricultural land, in order to plant tobacco, potatoes, cabbage, carrots and other vegetable plants, which have a high economic value.

The available agricultural land, however, has become very limited as the planting of all of the vacant lands has been completed.

In the old days, such specific problems have been restricted to quite manageable proportions, yet subsequently the problem has reached a scope requiring specific handling and attention.

Consequently, measures to successfully complete the reforestation efforts have become more difficult. It was feared that failures would ensue, while the land configuration of a generally mountainous area in the Malang and Magelang Forest District, had in fact made it all the more important for the reforestation programme to succeed, in view of the essential protection function of such area.

The Ma-Ma project involves a multi-crop planting system, in the form of blocks with wider spacing of the main plants, through a rotation, relay or meza cropping system.

The already implemented project uses a strip system with 6 blocks, having a width of 25 m each, in which the first block is planted with cash crops only for 5 years, the second block is planted with fire wood and mixed plants for a period of 5 years, the third block is planted with mixed plants for 10 years, the fourth through the sixth blocks are planted with mixed plants for a 15, 20 and 25 years period.

Rotation and relay cropping is implemented, after the 5 years contract has been completed, by planting the ex-cash crop planted block with mixed forestry plants for a period of 25 years, while blocks planted with already 5 years old fire wood are being felled and are converted into blocks planted with cash crops for a 5 years contract period. The whole is subsequently rotated every 5 years.

The results of the Ma-Ma project are still being observed, yet have already yielded favourable indications.

Ad e Spacing experiments

In the attempts to expand the agricultural functions of forest areas in terms of area extent as well as

duration of planting, spacing experiments have been conducted.

The spacing project attempted to change plant spacing from 3 x 1 m to 6 x 1 m and to apply the multi-crop system from the usual 2 years to a 5 years period.

The change in plant spacing resulted in a wider area available for planting cash crops, which is + 66% with the 3 x 1 meter spacing and increasing to 75% with the 6 x 1 meter spacing, with a longer period (5 years) for the multi-crop planting, without reducing the capacity of the forestry main plants.

The purpose of the spacing project is to increase the agricultural productivity of forest farmers and to better ensure the success of the reforestation efforts. The spacing project is temporarily implemented on teak wood forest areas while the results are still being studied.

3.2 Exploitation

In the past, timber production had mainly been concentrated on teak logs, which had largely been aimed for domestic use and supply of rail track support and basic wood for the PJKA (Railroad State Enterprise). At that time, the forest had still been intact with an abundant potential, timber exports were still limited and the established domestic industries were still at their initial stages, so that forest production, which had been regulated through disciplinary cuttings, could still meet the existing needs. The situation has now changed considerably. The condition of the forest plants is not as good as it was in the past, the need for wood and other forest yields has been increasing continually, due to the continued growth of industries directed at exports as well as to domestic markets. Forest security problems have also become more and more serious. Thus the demand for forest products has outpaced the existing forest potential.

The measures already undertaken by Perum Perhutani to meet the demand for forest products, are among others:

- * implementing intensification efforts in cutting activities, specially in thorough cuttings.
- * increasing the exploitation of non teak forests, specifically the Pine and Agathis species.
- * popularizing the use of non-teak wood, which has a lower price, originating from outside Java.

Intensification efforts in clear cutting, consist of measures:

- ** to reduce waste to the minimum;
- ** to implement cuttings at the lowest possible part of the trees;

** to allocate wood use in the most optimal manner, aimed at increasing production for wood works and reducing production for firewood uses.

These measures are undertaken through the method of tree by tree cuttings, which is an improved procedure of the block cuttings, while still maintaining the labor intensive-system.

The principal aim of the cutting intensification procedures, is to increase the volume and quality of forest products.

Even though the condition of the forest has not improved relatively to the condition before World War II, the yields attained has been increased due to the intensification measures. Average production per ha has increased from 109 m³ in 1977 tot 123 m³ in 1979, while the ratio of firewood cuttings has changed from 1:2 to become 6:1.

In addition to the above efforts, other exploitation activities, such as the exploitation of non-teak forest timber, mainly Pine and Agathis trees and other non-timber products, have also been given due considerations, with the aim of their further improvements, in line with their relative importance.

4 Industry

Because the main forest product is timber, which has a voluminous form while its price is to a significant extent dependent upon aspects of supply, demand and transportation, the efforts to increase the sales price per unit could only be made by a product diversification procedure, through its further processing.

In the past, sawmill establishments had been constructed with the aim of increasing the value of woods which had been rejected by the market.

The function of sawmills has now been changed into wood processing enterprises, in the form of integrated wood industries, with the aims of:

- * increasing the value added from processed wood;
- * expanding employment opportunities and increasing the level of income;
- * supplying foreign markets, in the context of increasing foreign exchange earnings.

In addition to the teak wood processing industry, the following industries have among others been developed:

- ** distillation of kayu put oil.
- ** processing of pine resin and distillation of terpentine.
- ** silk yarn manufacturing.

Before World War II, the teak wood processed at sawmills only constituted ± 3% of the total products. The proportion of processed wood, in the form of



Agroforestry: combination of wood production and grass for cattle fodder (Malang, Java).
Photo: L. Oldenkamp.

finished and semi finished products has now increased to \pm 18%.

The expanding products of teak wood processing industries, in the form of sawn timber, finished and semi-finished goods and the products of non-wood industries, indicate the increasing progress attained.

Sawn timber products and the semi-finished and finished products, such as wall panelling, parquet and veneer, are mainly directed for exports. Also pine resin is exported.

In addition to the aforementioned industrial activities, undertaken by Perum Perhutani itself, the company also carries out activities which support the growth of private industries, by supplying raw materials to the existing industries as well as to industries yet to be established.

Emphasis is placed on supplying raw materials to high priority industries, namely industries of economically weak entrepreneurs, in such activities as carving handicraft, burning of brick stones, roof tiles and limestone and cooking of coconut sugar and the granting of licenses and special facilities to the designated industrial circle. Special attention is also given to other industries, including the preparations made to supply raw materials to the paper plant, to be constructed in Cilacap.

The above description may have given a general idea on the extent of the effort to establish and promote existing and prospective forest yield industries. The growth of forest yield technology presents an extensive and growing horizon to the development of finished product industries, with forest product as their main raw material requirement.

Population growth and the increasing scarcity of forest resources have given rise to the absolute necessity to develop forest product processing industries, based on a utility policy approach, and adjusted to the local condition and situation.

Even though still at its initial stages, the wood processing industry on Java has quite a good prospect, in view of the increasing trend of domestic demand for processed wood and the expanding processed wood market abroad.

5 Marketing

Efforts to increase the volume, quality and variety of products, through intensification measures as well as through industrial development, constitute the stepping stone to efforts to expand the forest products market, in the context of increasing the income and promote the growth of the company, especially to support national development.

Although the programme for marketing forest products has very little changed from the old days to the current period, efforts have been and are still being made to develop the programme, involving a prior marketing analysis and taking a variety of factors into account.

As is known, marketing activities are important with respect to the following:

- ** the activities involve the marketing of all forest products, so that these could be used by the whole population;
- ** the marketing activities contribute to the mobilization of rupiah as well as foreign currency denominated funds;
- ** the marketing activities establish sales prices, at

levels, which could cover the company expenditures and yield profits, while contributing to domestic price stability, which is also dynamic;

** the marketing activities supply the domestic industries with the necessary raw materials in the form of forest yields.

In the implementation of such activities, the following efforts have among others been undertaken:

* Diversification of markets, especially by expanding the foreign markets in Asia, Europe, USA and Australia;

* Export promotion of finished and semi-finished products and the gradual reduction of log exports.

The results of the marketing efforts have improved from one period to another, as the marketing programme could generally be implemented and the targets realized.

Proceeds from domestic marketing as well as exports in the last 6 years have more than tripled.

In addition to the continuing efforts to promote exports and domestic marketing through auction sales, contracts and direct sales, also efforts are made to promote the economically weak enterprises, specifically wood carving enterprises and industries which use firewood as their basic material, through the granting of licenses to purchase the basic material at special prices.

6 Public Relations

The role of public relations in the past had been very limited as the forestry activities were still more involved in special inward looking matters, obviating

the need to give special attention to external problems.

In conformity with the requirements placed by external development and the growth of the company, public relations has assumed a very significant role in the process of expanding the implementation of the company's programme, on the basis of the symbiotic policy pattern.

Perum Perhutani has accordingly improved its organization, in the context of efforts to support the growth of the company and development of the community by establishing a special division entrusted with public relation matters.

The public relations division has been developed in such a manner so that its benefits are actually felt and facilitate the operations of the company in the midst of the growing development activities and the changing process of the community.

The aims of establishing the Public Relations division are among others:

** To create a continual harmonious relationship between the interests of the company and the interests of the communities around it;

** To create a favourable attitude of the community to the forest and forestry aspects in general and Perum Perhutani specifically;

** To induce the participation of community members in the activities of Perum Perhutani.

The activities cover internal as well as external undertakings.

The internal activities are implemented among others by the publication of the Duta Rimba and Gema Rimba Magazine, Leaflets, the Mingguan Bina Media, the making of photographs, slides, sound on



Afforestation with Pinus for the production of paper, matches and resin (Central Java).
Photo: L. Oldenkamp.

slides, the film movies, the establishment of a library, talking library and so on.

The talking library is the central attraction of the library, consisting of taped recordings, beneficial to solving problems encountered and to inspire new ideas.

The external activities are implemented through extension programmes, among others through information services by cooperating with the Information Office of the Regional Government, showing of motion pictures, broadcasting programme through the RRI (Radio of the Republic of Indonesia) and the TVRI (Television of the Republic of Indonesia), issuing press releases, exhibitions, the MA-LU (Mantri - Lurah = Cooperation of Forest Supervisor and Village Chief) activities, organizing the "giriwana" rally, forest excursions and other activities.

On account of these Public Relations activities, a relationship of mutual understanding and cooperation between Perhutani and the surrounding community has been engendered covering not only domestic but also international affinities.

7 Efforts towards community prosperity and conservation of the living environment

Because forests have a dual function, namely the protection and production function, a management which is solely concerned with commercial aspects is no longer effective in the current condition. Thus efforts must be made to maintain a harmonious relationship between economic and socio-economic considerations. This requires the optimal utilization of forest resources to yield the maximum value and benefits in the interest of the prosperity of the community and the nation, involving the multiple use of forest land.

Situated amidst the currently transforming and growing social environment, any effort on forest development can be successful only if it is also integrated with the process of developing the community environment, particularly the communities in the vicinity of the forest.

Since 1974, Perhutani has accordingly developed efforts directed at facilitating the realization of the community prosperity aim and the goal for conservation of the living environment by implementing new measures. The new measures comprise the prosperity approach policies, the MA-LU activities and activities on development of scenic forests and management of protected forests.

7.1 Policy based on the prosperity approach

Measures based on the prosperity approach are

founded on security considerations and are aimed at increasing the forest effectiveness to promote the community around the forest and facilitate the efforts to maintain forest security.

The measures comprise the implementation of the mass intensification of the multicropping system, establishment of base camps, guidance on cattle grazing plants, cultivation of bees, construction of check dams and water reservoirs, implementing the MA-LU project, the firewood project and others.

The steps undertaken in the policy based on the prosperity approach are:

- * Research works directed at solving various problems which have arisen in the implementation of this measure so that its undertaking could be further improved.

- * Perum Perhutani acting as the pioneer, stimulator and sponsor, with the subsequent development and management activities being undertaken by the local Government.

- * Carrying out regular information services and guidance activities to the community in the forest vicinity so that the measure could be disseminated expeditiously.

The implementation of each of the steps is as follows:

a Multi-cropping mass intensification:

- As described in the preceding section, the multi-cropping mass intensification is undertaken with the aim of increasing the income of forest farmers and improving the reforestation results.

- Credits and subsidies are granted for the procurement of paddy production means and technical guidance is provided with the cooperation of the Agricultural Office of the Regional Government.
- Increasing the average productivity of paddy yield per ha from 0.7 ton to create 2 to 3 tons annually.

b Establishment of Base Camps:

- The base camps are to function as a proper and sanitary shelter place for workers, who previously had lived in huts made of palm leaves, under sub-standard housing conditions.

- The base camps are to function as the centralization of manpower to ensure the expeditious allocation of employment and to promote stable employment for forest workers.

- The base camps are used to provide skills, proficiency and promote religious life and also to educate the children of the contract-workers so that they could have a better future than their parents, thereby making it possible to diversify employment opportunities.

c Guidance on cattle fodder procurement:

- Provision of guidance to the cattle breeders in the vicinity of the forests on the utilization of savannah grass, the system of keeping cattle in the stable, the negative consequences of illegal herding and the methods of planting elephant grass.
- Promotion of cooperation between Perum Perhutani and cattle breeders in the form of exchanging the elephant grass, planted by Perum Perhutani with the fertilizers yield by cattle breeders.
- The ultimate purposes is to avert illegal herding in the forest.

d Cultivation of honey-bees:

- Establishment of the Centre on Honey-bee Matters, in the Perum Perhutani territory, functioning as:
 - * the centre of information, directory services and guidance of the community;
 - * the centre for developing honey-bee colonies;
 - * the centre for training prospective honey-bee cultivators;
 - * the centre of tools on honey-bee cultivation.
- Providing guidance on the procurement of bee forage.
- The purpose of developing honey-bee cultivation by the community members is to increase the income level of the community.

e Construction of check-dams & water reservoirs:

- Check-dams are constructed for the purpose of:
 - * creating means for controlling floods and erosion;
 - * forming new methods in agricultural undertakings fisheries, providing recreational sites and other facilities for community members in the forest vicinity.
- Construction of water reservoirs is meant:
 - * to continually meet the fresh water needs of the village communities in the vicinity of the forest area;
 - * to place water reservoir at locations situated close to the houses of the population around the forest area;
 - * to provide guidance to the community members on the maintenance of water resources.

f Medicinal and tuber plants:

- Aimed at maintaining the preservation of medicinal and tuber plants in the forests and increasing land productivity by utilizing the soil space between forest trees.
- The planting of medicinal and tuber plants is also meant to increase the income level of the population in the vicinity of the forest areas.
- It is also directed at encouraging self-reliant activities of the population by planting medicinal and

tuber plants in their gardens, thereby capable of increasing their income.

g Intensification of efforts to cultivate dry lands and house gardens:

- This is meant to increase the production and quality of plant yields in the villages around the forest areas, thereby increasing the income level of the village population.
- It is directed at efforts on village land conservation.
- It is aimed at stimulating the activities of the population to become self-sufficient in food production.
- It is also meant to induce participation of the population in programmes on forest and forestry matters.

h Multi-purpose pond fisheries:

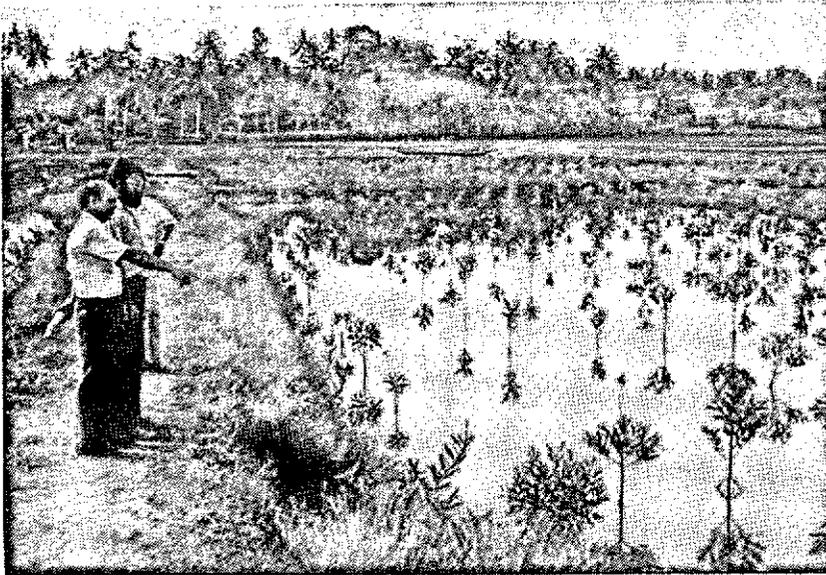
- This is meant to encourage farmers to preserve pond fish, in the context of efforts to increase the income level of farmers.
- It is also expected to contribute to the success of the water forest reforestation efforts.

i Firewood project:

- This is meant to provide sufficient firewood for the population around the forest area and for small industries using firewood as their basic material. Traditionally, firewood had been taken by destroying the forest areas.
- Location for the planting should give priority to the industrial circle of small scale industries and to areas vulnerable to forest security disturbances.
- The planting system is implemented as monoculture, fire-break, interplanting, sideline planting, ravine planting or the enrichment planting.
- Priority is to be given to the planting of Calliandra plants, which have the following characteristics:
 - * could easily grow with a wide habitat variation;
 - * easily reproduced;
 - * not harmed by cutting and could easily blossom again;
 - * could function as green fertilizer, firewood material, bee forage, decoration plant, soil conserving agent and so on.

j The MA-LU Project:

- It is a form of intensive cooperation and coordination between the Mantri (Forest Supervisor), acting as the plant expert and information center, with the Lurah (Village Chief) as a community leader. The provision of physical assistance and guidance services is expected to make the efforts based on the



Establishment of mangrove forest in combination with fisheries pond (Cilacap, Java).
Photo: L. Oldenkamp.

prosperity approach become more effective.

- The aim of the activities is to plant fruit producing plants and other types of superior plants on village lands bordering the forest area, so as to provide a vegetation coverage, thereby contributing to increase the protection function of forests from the current 23% to be targetted 30% and simultaneously increasing the source of income of the population.

- Plant seeds are procured from the aid given by Perum Perhutani, the extent of which depends on the local condition and the need of the relevant community, while the aid also includes the provision of information and technical assistance.

- It is also meant to contribute to such Government programmes as the activities on reforestation and animal husbandry.

k The Bi-Bi ("Biji" and "Bibit") project:

- This is an effort to promote the procurement and cultivation of seeds and seedlings for reforestation and replanting activities.

- The project is directed at involving forest farmers not only in agricultural farming but also in the supply of seeds and seedlings.

7.2 Promotion of living environment conservation measures

Efforts aimed at the promotion and conservation of the living environment are implemented through the establishment of beautiful forest sites, camping areas, organizing the "giriwana" cross country rally and maintaining natural conservation areas so as to educate the population to appreciate nature and to

arise the awareness of the people, especially the young generation on the important role of forests.

Various forest sites on Java, with one site separated from the other by a distance of around 100-150 km, have been designated as the areas for establishing the beautiful forest scheme, the camping grounds and cross country site facilities.

In addition, to increase the protection function related to hydro-ological aspects, efforts have been made to expand the management of protected forests, through measures on ravine planting and protection, enrichment planting, relay cropping, more intensive supervision and also to continually find other possible plantings which simultaneously could enhance the protection function.

It is realized that efforts, based on the prosperity approach and conservation of the living environment do not yet cover all environmental problems and needs. Nevertheless, from the experience in the last 6 years, positive results are beginning to show up in the form of the response and participation of the community members with regard to the forest and forestry activities.

Thereby, it is necessary that these efforts are continued.

V Conclusion

* In contrast to the situation in the past, the problems encountered on forest management on Java in the development era, have become more complex comprising the population density problem, socio-economic aspects, political aspects, technological aspects, security aspects and problems related

to the ecological balance. Thus a comprehensive forest management approach is needed, using the symbiotic policy formulation.

* Policies on forest management on Java, already implemented by Perhutani, have been directed at supporting the attainment of goals of National Development. These constitute the integrated management approach, which:

** undertakes activities on the intensification and diversification of production, processing and marketing of forest yields, in the context of increasing the income of the company and expand employment opportunities;

** increases the social benefits of forests, in the interest of the safety and prosperity of the surrounding communities;

** maintains, through the integrated approach, the conservation of the living environment.

* As a guideline to efforts aimed at realizing the goals of the company, a work plan has been formulated, by taking into account changes and needs of the environment, covering the aspects on technology, the industrial circle, product demand, economics, socio-political influence and so on. Such work plan is meant to ensure that work implementation is in conformity with the outlined policies.

* Planting activities have been directed at supporting the reforestation measures and to increase the income level of forest farmers. Even though the condition of trees is no longer as good as it was in the past, the intensification efforts have resulted in an increase in the average annual production volume per ha. Progress has also been made in activities on industrialisation and marketing.

* Activities, which support efforts to increase the prosperity of the community environment and to conserve the living environment, such as the multicropping mass intensification, provision of cattle food vegetation, cultivation of honey-bees, construction of check dams and water reservoirs, implementation of the MA-LU project, establishment of beautiful forest sites, camping grounds, organization of the "giriwana" rally and so on, have been well received by the community environment. The role of forests has been recognized by the people in general. Thereby these activities must be developed further.

* Moreover, public relations activities have been very beneficial in creating favourable opinion support and participation of the domestic as well as international community environment with regard to forests and forestry activities.

From the above information, it could be concluded

that the policies adopted by Perum Perhutani in the management of forests on Java have been in line with the needs of the current era.