JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
MALAYSIA
GOVERNMENT OF MALAYSIA

THE FINAL REPORT

OF

THE MASTER PLAN STUDY FOR THE FOREST

PLANTATION

DEVELOPMENT IN NORTHERN SABAH

IN

MALAYSIA

(SUMMARY)

November 1994

Japan Overseas Forestry Consultants Association

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1. INTRODUCTION

Economy of Sabah State depends on forestry highly. However, forest exploitation has caused a visible depletion of timber resources and rapid decline in timber production. In 1976, the Sabah State Government established Sabah Forestry Development Authority (SAFODA) and has made efforts to rehabilitate degraded forest lands by planting fast-growing species. Among other areas, the northern part of the state is less fertile and not so arable. There are lots of abandoned land areas covered with grass resulting from shifting cultivation in this area. Considering such the situation, the Government of Malaysia decided to promote regional development by means of forestry development in view of the poor soil conditions and deficient infrastructure in the Northern Sabah and requested the Government of Japan to prepare a master plan to design such the development scheme.

Based on above mentioned request, the Government of Japan sent a contact team to the Northern Sabah for the purpose of conduct survey and conferring with their Malaysian counterparts in December 1991. And in October 1992, another contact team was sent to Northern Sabah for a field survey and meeting with their Malaysian counterparts, and the scope of work and relevant minutes were signed.

In light of the natural and socioeconomic conditions and backgrounds of Northern Sabah, it is necessary to increase forest resources and improve the socioeconomic condition of the local people through regional development based on forestry. Therefore, this study, which was carried out from February 1992 to November 1994, is intended to prepare master plan for aiming at sustainable forest management to contribute to development of Northern Sabah.

2. OUTLINE OF THE PROPOSED PLAN FOR FORESTATION

Grassland or shrubs in the Northern Sabah have low productivity, therefore the most of these areas cannot use for agricultural land. However, if such land is forested, its fertility will be improved which enable timber production. If good forests are created by forestation, soil erosion in mountains will be reduced and the flow rate of rivers stabilized. Forests will also reduce the risk of damage by flooding. Forestation will contribute to lead development of wood processing industries which use logs produced from man-made forests. The development of wood processing industries is important for economic development in Northern Sabah. These are the reasons why forestation is necessary.

The total area covered by this study is about 323,000 ha, of which about 236,000 ha will be subject to forest management. Industrial forest management will cover about 54,000 ha of grassland and shrubs, and about 44,000 ha of low forests. According to this project, about 66,000 ha of newly planted clear cutting plantation and about 11,500 ha of enrichment planting will be completed in 2020.

Industrial plantation area in above mentioned areas are 42,000 ha. *Acacia mangium* will be newly planted in an area of 28,000 ha and *Paraserianthes falcataria* in 7,500 ha, and other species, such as *A. auriculiformis, Gmelina arborea, Tectona grandis* etc. in 6,500 ha. Stands classified as low forests will be undertaken enrichment planting.

The cutting period of *A. mangium* is seven years and they will mainly be used as pulpwood and chip for medium density fiberboard. Mean annual increment (MAI) of this species is estimated at 20 m³/ha on average in the first planting, and 25 m³/ha is result of effective tree breeding in the third planting. Meanwhile the cutting period of *P. falcataria* is ten years. Their main applications include blockboard, packing box panel, furniture and cabinet materials. MAI is estimated at 30 m³/ha on average in the first planting, and 33 m³/ha as a result of effective tree breeding in the second plantation.

Enrichment planting will be done by line planting method with an extraction width of 5 m. Two planting lines will be drawn within the width, and seedlings will be planted every

4 m in a zigzag pattern. The cutting period is forty years. Main applications include construction materials, plywood, flooring, furniture and heavy structural members.

The current level of infrastructure in this area is insufficient. Public roads and bridges should be improved in order to transport logs smoothly. It is planned that the density of forest roads will be 25 m/ha for clear cutting plantation areas and 20 m/ha for enrichment planting area. Bridge is also very important infrastructure for the forest management. Unless a bridge is constructed to cross the Bengkoka River, the economic value of logs produced in Pitas District will be remarkably low, and industrial forestation will not be viable.

Assuming that this project will start in 1997 and continue until 2020, net present value (NPV) of output–input for large and medium scale plantation areas calculated at a discount rate of 10% is negative, and the financial rate of return (FIRR) is 9.25%. This is resulted by combination of long term harvesting tree species which will not be harvested by 2020. If the financial analysis of this project is done by calculating expenses only for the species of *A. mangium* and *P. falcataria* which will be harvested within the period of this project. NPV calculated on the same conditions is MR38,419,000, and FIRR is 13.66%. Judging from these figures, profitability is fairly acceptable.

The global movement for the protection of tropical forests is strengthening. It is predicted that the supply of logs from natural forests in Sabah will fall short of demand within the State. A great hope is placed on logs from man–made forests in Sabah State.

Looking at timber trade in Asia, Malaysia has been the largest timber exporter, and the largest timber importer is Japan. For example, over 90% of imports of wood chips and particles within Asia is shared by Japan. Due to the decrease of domestic supply of pulpwood in Japanese, and the international movement to protect natural forests, Japanese pulpwood users will be forced to depend on its sources from man–made forests for the long–term stable supply of hardwood pulpwood. Therefore, *A. mangium* in Sabah will also be targeted as a source of hardwood logs to supply to Japan in the future.

Farmers dependent on shifting cultivation are living in proposed sites for industrial forestation. To carry out such forestation, the settlement of these farmers will be needed. The implementation of this project will provide more opportunities for earning incomes to the local people. Tree farming is to be introduced to generate income source to the farmers who live in the coverage areas of industrial forestation.

By 2020, it is expected that about 1.4 million m^3 of *A. mangium* logs will be produced annually from the plantations in this study areas as well as Bengkoka plantation of SAFODA. With such a large amount of output, these plantations will evolve significant contribution to develop forestry and wood processing industries in Northern Sabah.

3. RECOMMENDATION

Based on the results of the study, Study team would like to present the following recommendations.

1) Forest Management

Forest management systems to be adopted for this project are divided into four treatment categories, namely (1) afforestation, (2) reforestation, (3) enrichment planting and (4) natural regeneration treatment. These systems will be appropriately applied to forest lands within the coverage of this study.

Site for afforestation and reforestation combined will fall under the clear cutting and planting system. In this case, to avoid the uniform planting of a single species in a large area, natural forests will be remained on ridges, along valleys and steep slopes. And also, a planted area where would be the same tree age should be less than 100 ha.

2) Planting Species and Areas

The following is recommended as major planting species in view of soil and weather, growth, usage and economics, and areas to be planted.

Acacia mangium;
> Fast–growing species, clear cutting and planting system, 52,000 ha (including tree forming areas)

Paraserianthes falcataria;
> Fast–growing species, clear cutting and planting system, 7,500 ha

Gmelina arborea, Acacia mauriculiformis, Tectona grandis etc.;
> Fast–growing species (*G. arborea* and *A. mauriculiformis*), clear cutting and planting system, 6,500 ha

Subtotal areas   66,000 ha

Dryobalanops lanseolata (Kapur paji), *Shorea leprosula* (Seraya tembaga) and *S. parvifolia* (Seraya punai);

      For enrichment planting, indigeneous species

3)   Plantation Entity

      In this project, plantation entities are:

    (1)   SAFODA alone or its joint venture with a private company (or companies) for large-scale forestation

    (2)   SAFODA for medium-scale forestation

    (3)   Farmers for small-scale forestation

4)   Protection of Plantations

The present countermeasures against forest fires are not sufficient, and more efforts should be made to construct lookout towers, provide fire-fighting equipment, and enlighten people on fire prevention. The prevention of forest fires requires the local people to understand the forestation project. To promote their understanding, a system of information on the direct and indirect benefits of forestation should be established.

5)   Use of Timber from Man-made Forests

The major species to be introduced in this project is *A. mangium* mainly for pulpwood and medium density fiberboard chips. However, logs of high quality among all the produced should be used for molding and producing fiber joint boards, etc. as far as possible in order to improve their value added. *P. falcataria* and *G. arborea* should be first processed in Northern Sabah as much as possible so that wood processing industries will develop. An industrial park for timber industries could provide force of traction for such development. The Sabah State Government should give incentives for developing such a park in the region

for the purpose of the high-tech processing of small-diameter logs from man-made forests rather than the conventional sawing of large-diameter logs from natural forests.

6)   Provision of Infrastructure

The implementation of this project requires the provision of infrastructure, including forest roads and bridges. Such infrastructure will facilitate the distribution of forest products and other goods consequently make a great contribution to the regional economic development. Bridging the Bengkoka River is particularly needed. In addition, chip mills and log yards are also needed, and much attention should be paid to these facilities.

7)   SAFODA's Role

SAFODA is expected to play an important role in implementing this project. It will be the entity to operate plantations by itself or as one partner of joint venture and also promote activities, including the extension of tree farm, technical development, and enlightment on fire prevention. SAFODA will need administrative and financial assistance and support for unfolding the public function of forests, such as enrichment plantation, enlightenment on fire prevention. As far as enrichment plantation is concerned, SAFODA has no sufficient experience and should focus its effort on staffing, training, testing and research.

8)   Appropriation

Industrial forestation will need a huge fund. The Sabah State Government should take a special measure for fiscal investment in low-interest loans to large-scale forestation and fiscal investment in medium-scale forestation. The Government should also appropriate budget for SAFODA's extension activities, technical development and enlightenment on fire prevention in the case of small-scale forestation.

9)   Measures for Local People

The implementation of this project is expected to exert various effects on the local people, especially those dependent on shifting cultivation, tree farms, and forestry workers. Possible measures to be considered for them are as follows:

(1)   Settlement expansion and land reform for nontraditional shifting cultivators, and improvement in agricultural system by promoting agriculture and agroforestry for traditional shifting cultivators. In addition, promoting and expanding job opportunities in the forestry sector.

(2)   In most cases, small-scale forestation may be undertaken by farmers, including shifting cultivators. SAFODA's extension activities are expected for the spread of tree farms. It is assumed that a cooperative association like a forest owners association will be organized to cut and sell planted trees for the benefit of the farmers.

(3)   For forestry labour, as many inhabitants as possible should be employed. However, having fixed labour may create miscellaneous problems for plantation entities in the future. It would be preferable to perform forest operation by contract. Nevertheless, remarkable fluctuation in labour demand are no good for workers, and labour demand should be planned to keep the number of employees at a certain level.

CONCLUSION

The results of financial analysis of this project indicate that this project is fairly feasible and that the implementation of this project contribute to not only the development of forestry in Northern Sabah but also the development of processing industries of forest products in the downstream sector. Moreover, it will contribute in environmental improvement in Sabah as a part of tropical rain forest region. Therefore, it is earnestly recommended that this project should be implemented.