Title: Promotion of Tropical Non-wood Forest Products (NWFPs) in Thailand

Serial Number: PPD 4/98 Rev. 1 (I)

Implementing Agency: Forest Research Office (FRO), Royal Forest Department

Host Government: The Royal Thai Government

Starting Date: December 8, 1998

Actual Duration: 8 months

Actual Pre-project Cost: US$ 111,586
PART I. EXECUTIVE SUMMARY

1. Background Information About the Project

(a) The Key Problems It Intended to Solve (pre-project situation)

The interest in NWFPs is now emphasized on sustainable management and utilization of these resources. At present, the existing knowledge on appropriate technology for harvesting, processing, utilization and marketing is not available. Currently the method of collection and processing is by traditional small-scale methods. The forest dwellers and rural communities are primarily dependent on the collection and sale of NWFPs without any processing. Many of these products are becoming scarce in the natural forest. Some of these non-wood forest products particularly bamboo, rattan, gum and resin, edible insects, mushrooms are promising as products which can facilitate sustainable management of the forest area via viable economic returns from NWFPs.

At present, there is a lack of documented information on the followings:
- A comprehensive list of NWFPs in different part of Thailand
- List of NWFPs and their seasonality for collection
- Methods and problems of collection, processing and storage
- Marketing channel and trade of these products
- Socio-economic importance and product development
- The economic benefit of collection and sale of NWFPs of the forest dwellers

The pre-project is intended to determine the potential NWFPs and means of increasing sustainable production and utilization to promote socio-economic benefits of the local forest communities.

(b) The Specific Objective and Outputs

- Specific Objective:
To determine current use of NWFPs and the potential and means of increasing sustainable production of these forest resources in Thailand.

- Outputs
(1) Four technical documents on the current situation of production, utilization and marketing of NWFPs from 4 pitotsites in Thailand were prepared (in Thai language with English summary) namely:
   (a) A Case Study On Survey of Current Situation and Potential of NWFPs at Baan Mae-Mae Community Forest, Amphur Chiang Dao, Chiang Mai Province.
   (b) A Case Study On Survey of Current Situation and Potential of NWFPs at Dong Phu Community Forest, Amphur Rasisalai, Srisaket Province.
   (c) A Case Study On Survey of Current Situation and Potential of NWFPs at Baan Samakae Community Forest, Amphur Srisawas, Kanchanaburi Province.
   (d) A Case Study On Survey of Current Situation and Potential of NWFPs at Pru Kanthulee, Amphur Ta Chana, Suratthani Province.
2.1 The project proposal on “Promotion of the Utilization of Bamboo from Sustainable Sources in Thailand” was developed after carrying out an analysis and evaluation of the 4 selected community forests, taking into account the misutilization of bamboo resources at various stages such as harvesting, extraction, handling and processing of bamboo, the possibility of utilizing the resources and the need of the rural communities to have an economic alternative that will help them to improve their living standard. This project proposal was submitted to ITTO for consideration on 17 June 1999 and reviewed by the workshop on Promotion of Tropical NWFPs in Thailand held at Ubonratchathani Province on 6-8 July 1999.

2.2 A workshop on the “Promotion of Tropical Non-wood Forest Products (NWFPs) in Thailand” was held at the Nevada Grand Hotel, Ubonratchathani Province during the 6 to 8 July 1999. Forty participants from the Royal Forest Department, universities, non-government organizations, and community leaders were invited to participate in the workshop. Twenty two observers were also requested to join and participate in the workshop (as shown in the workshop report) The workshop had discussed and analyzed the needs and problems of the forest dwellers and stakeholders in harvesting, processing, and marketing of NWFPs and selected the promising tropical NWFPs as follows:

(a) Rattan
(b) Sugar palm
(c) Spices and medicinal plants

The participants were divided into 3 groups based on their interests to formulate the project proposal (in Thai) Three project proposals were partly drafted under the following titles:

(a) The promotion and development of sustainable utilization of rattan in Thailand.
(b) The promotion and development of integrated and sustainable utilization of sugar palm (*Arenga pinnata*)
(c) The promotion and development of sustainable utilization of spices and medicinal plants in Thailand.

2.3 During the workshop a project proposal on “Promotion of the utilization of bamboo from sustainable sources in Thailand” was presented by the National Consultant for review by the participants and it was well accepted and agreed upon the submission of the project proposal for ITTO consideration on 17 June 1999, which is the deadline for the xxvii Session of the ITTC & Associated Sessions of the Committees during 1-6 November 1999 at Yokohama, Japan.

2. Project Achievements

(a) Outputs Achieved

(1) The project progress report no.1 was submitted to ITTO on March 25, 1999, including the tentative programme for the workshop on “Promotion of non-wood forest products (NWFPs) in Thailand” to be held at Ubonratchathani Province in July 1999.
(2) The preliminary results of the survey from 4 sites were reported to the pre-project for review and discussion in early April. Preparation of the posters of the 4 case studies was conducted in April and May to be presented at the xxvi Session of the ITTC & Associated Sessions of the Committees at Chiang Mai Plaza Hotel, Chiang Mai Province during May 28 to June 3, 1999.

(3) The draft final reports of the 4 case studies were finished in June and the documents were distributed to all participants during the presentation to the workshop for information, comment, discussion, and suggestion. They were also used as baseline information for the formulation of the project proposals. The summarized version of the reports were presented in the workshop report.

(4) The project proposal on “Promotion of the utilization of bamboo from sustainable sources in Thailand”. Serial Number PD 56/99 (1). (already submitted to ITTO)

(5) The project proposal on “Promotion and development of sustainable utilization of rattan in Thailand” is prepared.

(6) The posters (in Thai language) of the 4 case studies were presented at the workshop (6-8 July 1999) at Ubonrachathani Province.

(7) The draft project proposals prepared by the workshop participants in Thai language were attached in the workshop report.

(b) Specific Objective Achieved

The pre-project is seeking to identify ways, not only to improve and regenerate the cultivation of the different products, but to promote and develop the entire production system, from cultivation to processing and marketing, in order to ensure that these NWFPs will have a sustainable future. The results of the case studies revealed that bamboo is widely used but there are many species which can be managed and have not yet been promoted; further research on the utilization of bamboo is needed. Bamboo and rattan, both of which have multiple use for construction and building, furnitures, weaving, handicrafts and for subsistence are prominent NWFPs in each of the 4 project sites. The rattan supply now has to be imported from elsewhere to support the industry. In the north and northeast, the potential of promoting edible rattan is recognized. Only one and a half years after planting, the rattan can be harvested for edible shoots and in the next five to six years it can also be utilized for handicrafts and furniture. There is possibility to develop edible rattan shoots as an agricultural crop and small-scale enterprise for canning rattan shoots can be established such as in bamboo shoots.

Another product with potential for development is the sugar palm (Arenga pinnata Merr) in the north, west and south of Thailand. Consideration for project preparation will be discussed for the future. Edible leaves, spices and medicinal plants are also identified as NWFPs with potential for further promotion. It can be seen from the outputs that the specific objective was fully achieved.
(c) Contribution to the Achievement of the Development Objective

In order for the conservation of natural forest and the sustainable management of forest and plantation, appropriate NWFPs which will have a sustainable future, should be promoted and developed for the entire production system.

From the 4 case studies and the results of the workshop, four project proposals are recommended in priority as follows:-

(1) Promotion of the utilization of bamboo from sustainable sources in Thailand.
(2) Promotion and development of sustainable utilization of rattan in Thailand.
(3) Promotion and development of integrated and sustainable utilization of sugar palm (Arenga pinnata Merr.)
(4) Promotion and development of spices and medicinal plants in Thailand.

The last two project proposals will be prepared when the situation is appropriate in the near future.

All the projects were discussed by the workshop participants who came from different disciplines and organizations, i.e. foresters, researchers, community leaders, extensionists, farmers, small-scale industrialist, and NGOs with good participation and understanding. It is expected that they will disseminate the results of the workshop to their respective organization and all the people interested in NWFPs management.

It is observed from the outputs and activities of the pre-project that the development objective were fully achieved.

3. Target Beneficiaries Involvement.

This pre-project has pointed out that the direct beneficiaries will be the forest dwellers engaged in the collection, processing, storage and sale of non-wood forest products. Also the producers, exporters, and marketers of NWFPs will have usable guidelines for sustainable utilization. Ultimately, other member countries of ITTO, facing similar problems will benefit from the output of this pre-project.

The 3 activities of the pre-project allowed the involvement of many beneficiaries, they are:-

(1) The surveys of the 4 pilot areas in the community forests in the north, northeast, west and south of Thailand were conducted by researchers of the Forest Products Research Division, Forest Research Office, RFD with the assistant of many research assistants in the field under the guidance of the pre-project leader and the national consultant. The survey cannot be accomplished without the assistance and cooperation of the forest officials from the regional and provincial forest offices, and most importantly, the cooperation of the village leaders and villagers who were the main informants during the survey. The cooperation of the monks, traders and users were also very important to the success of the survey. Individual researcher and concerned offices were also interviewed to acquire supporting information.
(2) The 40 workshop participants and 22 observers from many organizations, participated in the 3 days workshop, had discussed and exchanged ideas and information to analyze the needs and problems of NWFPs management leading to the selection of promising tropical NWFPs, and formulation of a project proposal.

(3) The researchers of the FRO who were assigned to prepare the complete project proposals on bamboo and rattan had direct involvement. These were the two priority projects agreed upon by the workshop to submit to ITTO for consideration.

One can say that not only the contacted persons, but their concerned organizations were involved in this pre-project.

Member countries of ITTO will benefit after the dissemination of the pre-project and project results in the future.

4. Lessons Learned.

(a) Development Lessons

In designing the project to be financed by ITTO, the designer had to think about the criteria set in Article 23 of ITTA which is to be related to the production and use of industrial forest products and yield benefits to the tropical timber economy as a whole and be relevant to both producing and consuming countries. It should also be related to maintaining and expanding the international trade in tropical timber. And it should offer reasonable prospects for positive economic returns in relation to cost. So, it is rather difficult to establish the development objective to meet with all the criteria which can also successfully implemented.

The intersectoral links were not changed from the original design, so there is no affect concerning this part.

The additional arrangements that could improve cooperation between the relevant parties interested in the project are the time constraint, because most of the NWFPs are seasonally available. The arrangement to survey and collect relevant information should cover at least one calendar year.

There are no factor that will affect the sustainability after completion because the main output is the preparation of project proposal of different promising NWFPs for further research.

(b) Operational Lessons

The project organization by the pre-project leader was well accepted by concerned authorities and researchers.

The project management was almost as planned, with little flexibility due to the availability of the researchers. This pre-project was strategically working for its structural strength as a team.
The pre-project ends with very good documentation in photographs, and graphic drawings, besides the quality of the reports of the 4 case studies and the poster presentations at the XXVI Session Meeting in Chiang Mai and the workshop at Ubolratchathani.

The monitoring and evaluation from the side of ITTO secretariat was very effective and built up good suggestions and development of the pre-project. The progress report was submitted after the evaluation.

The quality of the project planning was good with two exceptions. First, there was some confuse about the selection of the pilot sites which needs some changes afterward. The second exception was the time frame of the pre-project which cannot cover calendar year. There might be enough reason from the financial aspect to limit the pre-project to only 6 months instead of one year. The roles and responsibilities of the institutions in the pre-project implementation were well planned. The execution body is the Forest Research Office which covers all areas of forestry research, so the establishment of the research team for each project is quite usual.

The experiences of the pre-project leader and the research team are very important factors to avoid variations between planned and actual implementation. The research team spirit, availability and devotion are very important to implement the research work to conform with the schedules and costs. This pre-project did not have too much variation, except for report writing.

There were no external factors that negatively or positively influenced the pre-project implementation.

(c) Recommendations

The term ‘non-wood forest products’ refers to all plants and animal products derived from wild sources and collected on forest lands, and/or from forest species. By this definition, it is rather difficult to find the promising NWFPs to focus research activities to meet the requirement of all stakeholders and the granting agencies. It is recommended that, if time permit, before the preparation of the project a brainstorming exercise should be conducted by all concerned in NWFPs management. It is then expected that the project proposal will cover all the important issues and priority can be arranged to cope with the situation. The NWFPs workshop recently organized by this pre-project was a good example. The research team members and workshop participants have gained a lot of experiences and we do hope that they will use this experience to prepare their own projects in the future.

ITTO grant support for seminar or workshop is very helpful in promoting the interest and awareness of individual and concerned organizations in the sustainable management of NWFPs.
PART II. MAIN TEXT

1. Project Content

   - Objective

   The development objective of this pre-project is to provide information and develop technology on the role of non-wood forest products utilization, collection and marketing in promoting socio-economic benefits in local forest communities on a sustainable basis. The increased income of the local forest communities will also have a positive effect on sustainable forest management.

   The specific objective is to determine current use of NWFPs and the potential and means of these resources in Thailand.

   Outputs and Activities

   Output 1: Technical document on the current situation of production, utilization and marketing of NWFPs in Thailand

   Activity 1.1: To conduct a survey of 4 pilot areas in community forest in the north, northeast, south and west of Thailand to collect information on collection, harvesting, utilization, marketing and socio-economic issues.

   Conducted survey at 4 pilot sites namely:

   (1) Baan Mae Mae Community Forest at Amphur Chiang Dao, Chiang Mai Province in the north. This forest covers an area of 54,400 rai, located at 600-800 meters above msl. The dominant forest types are hill evergreen and dry dipterocarp forest. The community woodlots comprises 400 rai and the cultivated areas are 1,600 rai. The number of households are 105 with 503 populations (lowland Thai and musso). The main occupations are agriculture and NWFPs collection.

       The promising and potential NWFPs are:-
       - Sugar palm (Argenga pinnata Merr)
       - Bamboos
       - Medicinal plants
       - Mushroom
       - Rattan
       - Honey
       - Broomgrass (Thysanolaena maxima Kurz)

   (2) Dong Phu Community Forest at Amphur Rasisalai, Srisaket Province in the northeast under mixed deciduous, semi-evergreen and riverine forest, about 120 meters above msl. The total areas are 13,282 rai, with 3 villages, 468 households and 3,170 populations which mostly depend on agriculture (89%). Agricultural land areas 7,431 rai, average land holding 16 rai/household. Fisheries areas (reservoir) about 1,000 rai, public land 3,917 rai. At present, there are only 2,000 rai of community forest under the management of the Community Committee.
The promising and potential NWFPs are:
- Medicinal and Edible plants
- Mushroom
- Edible insects
- Natural dye plants

(3) **Baan Samakae Community Forest** at Amphur Srisawas, Kanchanaburi Province in the west under dry dipterocarp and semi-evergreen forest about 500 meters above msl. The total forest areas are 3,650 rai, with 4 villages, 244 households and 1,127 populations (muesso and lowland Thai). Most of them live on agriculture (91%) and NWFPs gathering.

The promising and potential NWFPs are:-
- Kravan (*Amomum krevunh*)
- Edible plants
- Bamboos
- Medicinal plants
- Mushroom
- Tree leaves (for roof thatching)

(4) **Pru Kanthulee Community Forest** at Amphur Ta Chana, Suratthani Province in the south under peat swamp forest, about 15-18 meters above msl. The total community forest areas are 875 rai, with 2 villages 213 households and 981 populations engaged in fruit orchard, pararubber plantation, oil palm and coffee.

The promising and potential NWFPs are:-
- Edible plants
- Ornamental plants
- Mushroom
- Edible insects
- Kor (*Livistona speciosa*) for roof thatching.
- Medicinal plants.

The result of each pilot sites survey is shown in separate report.

**Output 2**: Project proposal on promotion of tropical non-wood forest products in Thailand, aimed at improving harvesting, processing, marketing of tropical NWFPs

**Activity 2.1**: To organize a 3 days workshop on promotion of non-wood forest products (NWFPs) in Thailand. 40 participants from RFD, universities, private sector, and representative of non-government organizations will be invited to participate in the workshop. The workshop will discuss and analyze the needs and problems of the forest dwellers in harvesting, processing and marketing of tropical NWFPs. The discussion will also include the selection of promising tropical NWFPs and formulation of a project proposal.

The workshop was held at Nevada Grand Hotel, Ubolratchathani Province. 40 participants and 22 observers participated in this workshop representing RFD, universities, NGOs, village leaders, traders and farmers. Keynote addresses on non-wood forest products in
Thailand and bamboo and rattan in Thailand were delivered by the experts before the presentations of the 4 case studies from 4 pilot sites by the research teams to make the participants informed and led to further discussion. A one day field excursion to Dong Yai Community Forest, one of the outstanding community forest in Thailand was organized to familiarized the participants with the real conditions. The example of the project proposal was introduced by the national consultant to guide the participants on their group discussion and draft project proposal preparation. Three groups of about 20 participants were assigned to discuss and formulate only one draft project proposal on:

- Rattan.
- Sugar palm.
- Spices and medicinal plants.

In the plenary session, each group presented their draft project proposals on:

(1) Promotion and development of sustainable management and utilization of rattan in Thailand (in Thai).

(2) Promotion and development of integrated management of sugar palm (in Thai).

(3) Promotion and development of sustainable management of spices and medicinal plants in Thai and (in Thai).

Discussions, suggestions, and comments were made during each group presentation before the closing remark by Dr. Ma Hwan Ok of ITTO secretariat.

Activity 2.2: To prepare a project proposal in accordance with ITTO Guidelines that should reflect the identified needs and problems of forest dwellers in harvesting, processing and marketing of NWFPs.

Two project proposals were decided by the pre-project after consulting the workshop participants to submit for consideration by ITTO during the forthcoming sessions, they are:

(1) Promotion of the utilization of bamboo from sustainable sources in Thailand. This project is already submitted to ITTO for the XXVII. Session of the ITTC & Associated Sessions of the Committees consideration in November 1999.

(2) Promotion and development of the sustainable management of rattan in Thailand. This project will be submitted for the XXVIII Session of the ITTC next year.

The pre-project is consistent with objectives, established in Article 1 of the ITTA 1994: To promote and support research and development with a view to improving forest management and efficiency of wood utilization as well as increasing capacity to conserve and enhance NWFPs values in timber producing tropical forest. It will also have peripheral beneficial effects on the attainment of other objectives listed in the ITTO as the pre-project will promote the collection, processing utilization and marketing of NWFPs on a sustainable basis and therefore become an integral part of sustainable forest management in Thailand.
The pre-project is related to ITTO Action Plan, priorities and its programme, such as:-
- Identification of pilot areas where sustainable production and utilization of timber and non-wood products may be combined.
- Delivery of trial volumes of new species and products, and other approaches to facilitate acceptance in selected foreign market.

The pre-project is submitted in accordance with the criteria set in Article 23 of ITTA which it is related to the production and use of industrial forest products and also related to maintaining and expanding the international trade in tropical timber.

2. Project Context.

At least five million people, the approximate number of actual forest dwellers in Thailand, are critically dependent on NWFPs. The total population deriving benefits from these commodities is substantially greater. The major contributions of NWFPs are as follows:
- They provide material needs, cash income, and employment at levels which are significant to the rural and national economics of the Kingdom.
- Their extraction represent a non-exhaustive or sustainable form of tropical forest utilization. This model enhances the value of intact forests, counterbalances the incentives for deforestation, and offers a chance for the survival of the tropical forest resources.

The National Policy stated that 15% of the country 40% of forest areas shall be designated as production forest of produce timber and other forest products.

It will also support the National Economic and Social Development Plan VIII in increasing extra income for the rural people by interpolating NWFPs source in forest plantation, in farm and in community forest or in tree farming programme which was launched in 1996.

3. Project Design and Organization.

There is an immediate need for conserving the forest resource base, while developing the harvesting, marketing, and local processing of non-wood forest products. If no action is taken, many rural people will suffer, the way of life of traditional forest dwellers will disappear, and with it will be lost their vast store of knowledge on the use and sustainable management of non-wood forest resources. Those promising NWFPs with high economic potential must be raised as crops, so that people do not have to depend on the wild plants to obtain them.

The project is designed on this concept using the community forests which represented the north, northeast, west and south regions as pilot sites. The cooperation of the regional and provincial forest offices was very helpful for the success of the project organization. The participation of the village leaders and the villagers as the key stakeholders as the main beneficiaries were well recognized in the project design. The research team and research assistants were the key responsible inputs from RFD and the project. The concerned organizations where informations were gathered and rendered consultation to the research team were the main contributors to help the project organization success.
The survey part of the pre-project helped to stimulate the interest of the forest dwellers and the concerned beneficiaries in the field at one level. The workshop part helped to publicize the pre-project and make it known to interested people and organizations, because it was televised throughout the country.

The workshop result may lead to the beneficiary involvement with future project’s efforts and actions.

4. **Pre-Project Implementation.**

   - **The most critical differences between planned and actual project implementation (cost, components, schedules, etc)**

The planned overall cost was US$ 109,886 in which Thailand Government contribution was US$ 20,000 and ITTO contribution was US$ 89,886. The actual total expense was US$ 111,586. The detail are listed in the table below.

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<th>Thailand Gov. Cost (US$)</th>
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<td><strong>TOTAL</strong></td>
<td>89,886</td>
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The planned duration for the pre-project was 6 months. As the pre-project started, the consultation was held among the consultant and project personnel which come to the conclusion that the pre-project site which have been selected should be changed from Rayong Province to Srisaket Province because Rayong Province is now an industrial city and from Ban-Pae community forest to Ban-Mae Mae community forest Chiang Mai Province because Ban-Pae forest is used for water conservation only and is not far form the city so the rural people have an occupation for their livelihood. So the schedule for conducting a survey of 4 pilot areas were delayed. In addition, the schedule for the workshop was delayed about 2 months because it was nearly overlap with the 26th ITTC meeting in Chiang Mai.

   - ** Appropriateness of pre-project inputs**

The financial input by both ITTO and Thailand Government was in time according to the Agreement.

The national consultant and 4 assistants inputs were planned but the secretary input was planned by The Royal Forest Department. The quality of the input personnel was excellent.
5. Project Results.

After completion of the pre-project, the project staff believes that they realized the NWFPs condition in the country better than before. They know how to prepare the project proposal, conduct a survey, prepare a poster, write a report and hold a workshop. The NWFPs are better understood by relevant organizations, NGOs, stakeholders, and forest dwellers that the significance of these commodities in the rural and national economies has been little appreciated. Yet NWFPs can play a key role in alleviating rural poverty; they offer the poor a means to increase both their food production and their incomes.

Promotion and development of each non-wood forest product may need research in many disciplines, The way to manipulate NWFPs for sustainable management and product development is still in doubt. How to utilize the products more efficient and how to promote market information in order to promote tropical NWFPs in the region.

The results of the pre-projects to date are:
(a) The four technical documents on the current situation of production, utilization and marketing of NWFPs from the 4 pilot sites, representing the north, northeast, west and south of Thailand are prepared.
(b) The project proposal on “Promotion of the Utilization of Bamboo from Sustainable Sources in Thailand” was prepared.
(c) A workshop on the “Promotion of Tropical NWFPs in Thailand” was organized.
(d) Draft project proposal were prepared by the workshop participants as follows:-
   (1) Promotion and development of sustainable utilization of rattan in Thailand.
   (2) Promotion and development of integrated and sustainable utilization of sugar palm (*Arenga pinnata* Merr)
   (3) Promotion and development of sustainable utilization of spices and medicinal plants in Thailand.

It is recognized that the specific objective of the pre-project was achieved.

The impact of the pre-project results on the physical environment on the social environment, and on the target beneficiaries was not indicated at this stage, unless the project proposals prepared will be supported and granted for further research.


(a) Specific Objective Achievement

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(b) Outputs

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(c) Schedule

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(d) Actual Expenditures

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<th>Below planned</th>
<th>More than 10% above planned</th>
<th>More than 20% above planned</th>
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PART III. CONCLUSIONS AND RECOMMENDATIONS

(a) **Development Lessons**

There is a saying that "Community forest is a supermarket for the forest dwellers" which need to be proven. The lessons learnt by our research team are very useful for further discussion and research.

The design of the pre-project was well accepted by the concerned authorities and the workshop participant. The survey method conducted with local people participation received high attention and cooperation by all concerns.

The time frame of the survey period should cover at least one calendar year, because we want to establish a NWFPs calendar, otherwise the interviewers had to remind their memories.

The availability of the research team and the assistants was also very important to conduct research in this short period.

(b) **Operational Lessons**

The organization structure of the pre-project was well realised that the Forest Research Office has full responsibility to administer the research activities of the RFD. This office can acquire cooperation and assistance from other RFD offices and concerned agencies outside the RFD.

The pre-project operation was mostly smooth as planned, except some minor change of the schedule for some activities. The specific objective was well accomplished and the research team has established good relationship with relevant parties. It is hoped that further cooperation will be strengthened for the future research project of this nature.

(c) **Recommendations for Future Projects**

The results of this pre-project revealed that:-

- **Inadequate knowledge and lack of expertise.** The low unit value of the products is often due to primitive processing techniques. This applies to all NWFPs, but especially to rattan and even to bamboo, both of which have been used throughout the ages.

- **Limited potential for domestication of the resource base.** Attempts have been made to cultivate some of the important plant species which have been growing in wild, but with limited success. The main limitations are inadequate scientific knowledge and lack of expertise, and the socio-economic aspects. Wild plants that have been domesticated successfully are mostly annual crops, while those that take many years to grow have not in general been successfully cultivated. Examples of the latter include rattan, sugar palm and trees that are used for food or medicine. Their long growing period, coupled with inadequate knowledge of their culture, makes them a risky crop and discourages investing in them.

- **Inadequate support services.** The activities of state agencies in the sector are not fully focused on promoting NWFPs development.

It is recommended that:-

- Knowledge of the resources must be expanded, and technology for propagation and
- Support must be provided. In addition to the conduct of research and the development of cultivation and processing technologies, state agencies and other institutions must provide:
  - Market information published regularly, so that the collectors and other primary producers can obtain fair prices for their products.
  - Long-term credit, so that the collectors and other primary producers will not be at the mercy of traders, who often act as money lenders.
  - Extension and training, so that the collectors and other primary producers can obtain the required know-how and develop the necessary skills.
  - Favourable policy environment, so that obstacles are eliminated, and the outcomes of new ventures are more predictable, and less risky. Unnecessary restrictive rules and regulations on product gathering and transport are some of the aspects that need to be reviewed and changed.

**For Future Projects:**

**Identification:**
The research project should focus on the priority promising and potential NWFPs first, with well defined objectives and plans.

**Design:**
The project design should rely on available research staff and other logistics.

**Implementation:**
The planned activities of the project should be relevant to the availability of the supporting logistics, e.g. researchers, money, equipment etc.

**Organization:**
Project organization under the supervision of specialized project manager/leader will guarantee the success.

**Management:**
Project management can be improved if based on well-planned activities and schedules. The experience of the project manager is very important in effective project execution.

**Responsible for the report.**

**Name:**  Mrs. Wanida Subansene ..........................
**Date:**  August 31, 1999
**Position held:**  Pre-project leader.
Senior Forest Products Expert.
Forest Research Office.
The Royal Forest Department
Ministry of Agriculture and Cooperatives
Co-Chair of IUFRO Working Parties P.5.07.03
Pre-project PPD 4/98 Rev 1. (1) : Promotion of Tropical Non-Wood Forest Products (NWFPs) in Thailand

Implementing Agency : Forest Research Office (FRO), Royal Forest Department (RFD)

Pre-project Objectives

1. Development Objective : To provide information and develop technology on the role of non-wood forest products utilization, collection and marketing in promoting socio-economic benefits in local forest communities on a sustainable basis. The increased income of the local forest communities will also have a positive effect on sustainable forest management.

2. Specific Objective : Determine current use of NWFPs and the potential and means of increasing sustainable production and utilization of these forest resources in Thailand.

Characteristics of the Regions Where Pre-project Are Located.

The pre-project sites are located in 4 local forest communities in the northern, northeastern, western and southern forest regions, namely:

1. Baan Mae-Mae, Amphur Chiangdao, Chiang Mai Province, located in the northern region covered with hill evergreen and dipterocarp forests, about 600-800 meter above mean sea level.

2. Dong Phu Community Forest, Amphur Rasisali, Srisaket Province, located in the northeastern region covered with mixed deciduous, semi-evergreen and riverine forests, about 119-131 meter above mean sea level.

3. Ban Samakae Community Forest, Amphur Srisawas, Kanchanaburi Province, located in the western region covered with dry dipterocarp and semi-evergreen forests, about 500 meter above mean sea level.

4. Pru Kan Thulee, Amphur Ta Chara, Suratthani Province, located in the southern region covered with peat swamp forest, about 15-18 meter above mean sea level.
A Survey on Situations and Potential of NWFPs in Thailand

1. A Case Study at Baan Mae Mae Community Forest

Introduction.

Baan Mae Mae Community Forest was selected to replace Baan Pae because this forest has long been established in the big forest surrounded by mountainous ranges, where the community committee was actively involved in forest protection and conservation. Many government agencies rendered support in many means to help the people to effectively manage their forests. The survey results may offer different outputs from the high mountain dwellers to be used as a guideline for future project proposal formulation.

Site Characteristics.

Baan Mae Mae was officially established as a village under Mae Na District, Amphur Chiang Dao, Chiang Mai Province in 1956 before the Chiang Dao National Forest Reserve was gazetted in 1973. The village was situated in the narrow belt along the waterways surrounded by the high mountains on 4 sides. The forest type are hill evergreen and dry dipterocarp forests located about 600-800 meters above mean sea level.

The population consists of lowland Thai and Musso totally 105 households with 503 peoples, of which 271 are males and 232 are females.

The total areas under management of this village community committee are 56,400 rais.

(1) Settlement areas 400 rais
(2) Cultivation areas 1,600 rais
(3) Village woodlots 400 rais
(4) Conservation forests 54,000 rais

The main occupations of the villagers are tea plantation, fruit orchard (lichee and longan), handicrafts (bamboo and rattan), medicinal plants, sugar palm, livestock raising, coffee and other horticultural crops.

The villagers experienced severe flood in 1978 and severe drought in 1979, causing them to aware of the forest conservation in the watershed areas and formed the village committee to set up rules and regulations for forest protection, fire control, medicinal plants and bamboo harvesting and utilization and other conservation measures. The regulations are agreed upon by majority of the community members.

The forest officials render advice and support in various means to promote their conservation activities.

Study Methodology

(1) Interviews with members of the communities.
(2) Rapid Rural Appraisal (RRA)
(3) Plant community study.
The criteria established for this survey are mainly focus on:-
1. Resource availability.
2. Household consumption.
3. Technical support.
4. Job and income generation.
5. Marketing opportunities.
7. Economic incentive.
8. Environmental constraints.

The pre-project is seeking to identify ways, not only to improve and regenerate the cultivation of the different products, but to promote and develop the entire production system, from cultivation to processing and marketing, in order to ensure that these NWFPs will have a sustainable future.

Results.

The results shows that the average age of the population is 46 years, 53% are males and 47% are females and all of them engaged in agriculture with 23,382.25 Baht/annum of household income. The average income from NWFPs collection is only 3,007.35 Baht/annum.

The NWFPs collected and utilized by this community are:-
1. Resin and Yang Oil.
2. Bark.
3. Edible plants.
4. Mushroom.
5. Bamboo and rattan shoots.
6. Spices and medicinal plants.
7. Bamboo and rattan.
8. Edible and industrial insects.
9. Other products i.e. broom grass, tatch roof leaves etc.

The quantities and values of each products are varied from year to year depending on the environmental conditions such as for 1998, the amount of edible plants and mushroom was ≈ 19,794 kgs. valued about 405,202 Baht; bamboo and rattan about 6,116 culms, valued about 218,712 Baht; medicinal plants ≈ 1,716 kgs, valued about 60,311 Baht; bamboo and rattan shoots ≈ 3,876 kgs, valued about 18,659 Baht; edible and industrial insects ≈ 1,307 kgs, valued about 66,037 Baht; and small amount of resin and yang oil, bark, tannin and dye.

The potential NWFPs by rank are :-
1. Sugar palm (*Arenga pinnata* Merr.)
2. Bamboo.
3. Medicinal plants.
4. Mushroom.
5. Rattan.
The information about collection, processing, utilization and marketing of these NWFPs was presented. It was found that the management of these activities are at the local and provincial scale, using traditional technology without any support from the concerned agencies.

There are lots of possibility to promote and develop the management of all these potential NWFPs at the small industrial scale, using appropriate technology.

2. A Case Study at Dong Phu Community Forest.

Introduction.

Dong Phu Community Forest was selected to represent the community forests of the northeast, where community forests are the key component of the lifestyle of the people. This was to replace Baan Laeng Community Forest of Rayong Province in the east of Thailand, because people in the east are not relyed very much on the NWFPs for their daily life. Dong Phu has a long history in village settlement for 200 years. The information from this survey may help the pre-project to support the project proposal formulation as a representative of the northeast.

Site Characteristics.

Dong Phu forest under Amphur Rasisalai, Srisaket Province was one of the oldest big forests from 200 years ago, but it was just gazetted as a National Forest Reserve in 1974. Subsequently, the Royal Forest Department has set aside this forest as a village supply forest. In 1978, this forest was partially allowed for logging under a forest concessionaire scheme, which reforestation was one of the requirement under these concession. The reforestation activities by the logging company were seen by the local communities as a destructive practice, which may lead to negative environmental problem. They protested the reforestation programme and establish the community committee consisting of 30 persons from 3 villages to conserve and manage the forest in the form of community forest. At present, there are only 2,000 rais left; the forest types are mixed deciduous, semi-evergreen, and riverine forests, about 119-131 meters above mean sea level.

There are 3 villages, 468 households, 3,170 populations. The total land areas covered 13,282 rais, divided into :-

1. Agricultural land 7,431 rais.
2. Reservoir area (for fisheries) 1,000 rais.

About 89% of the populations depend on agriculture. The average land holding is about 16 rais/household. NWFPs collection is only supplement occupation of the local people which mostly use for household consumption. Most of the former national forest reserve land are set aside for agriculture because of many socio-economic constraints.

The forest officials rendered only advice and support to help people protect and conserve the community forest for their future generation.
The communities established their rules and regulations to manage this community with
good acceptance by the villagers.

**Study Methodology**

1. Review existing official documents
2. Interviews with the communities, using questionnaires.
3. Rapid Rural Appraisal (RRA)
4. Plant community study.

The criteria established for this survey are mainly focus on:-

1. Resource availability.
2. Household consumption.
3. Technical support.
4. Job and income generation.
5. Marketing opportunities.
7. Economic incentive.
8. Environmental constraints.

The questionnaires are analysed to acquire information on the entire production system,
from collection to processing, utilization and marketing to be used as a guideline for
further project proposal preparation.

**Results.**

It was found that there are 2 spirit houses in this community forest, which the people pay
very high respect when they got into the forest. The forest areas decreased from 5,100 rais,
when it was first gazetted in 1974, to 2,000 rais in 1998. At present the forest conditions
become replenish after a strong conservation measure was applied.

The NWFPs collected from this forest consist of :-

1. Resin and Yang oil.
2. Medicinal plants.
3. Edible plants.
4. Tuber crops.
5. Mushroom.
7. Natural dye plants.

The quantity and value of each NWFPs are difficult to assess. The estimations from the
interviews show that the edible plants collected about 14,942 kgs/annum; tuber crops about
7,000 kgs/annum; mushroom about 157,336 kgs/annum; edible insects about 20,777
kgs/annum, and natural dye from Diospyros spp. is very familiar for local people.

The crops and NWFPs calendar are presented, including their marketing channels from
collection to the consumers or the markets. It was observed that people living far away or
living in town also come to collect NWFPs from this Dong Phu forest, so it is difficult to survey.

The potential NWFPs by rank are:-
1. Medicinal plants.
2. Edible plants.
3. Forest fruit plants.
4. Mushroom.
5. Edible insects.
6. Tuber plants.
7. Natural dye plants.

The interview results show that bamboo and rattan used to find in the riverine forests, are now inundated after the construction of Rasisalai Dam few years ago. The potential for promotion of bamboo and rattan is seen to be promising even though the survey results are not presented.

3. A Case Study at Baan Samakae Community Forest.

Introduction.

Baan Samakae Community Forest was selected to represent the western part of Thailand by the recommendation of the Community Forest Division and the Kanchanaburi Provincial Forest office, because the inhabitants of these villages are both Musso and lowland Thai. There are believes that the Musso lives in harmony with the forest without deteriorating the forest ecosystem, so the pre-project would like to acquire information from these communities to be used as a guideline for project formulation.

Site Characteristics.

Baan Samakae is located in Amphur Srisawas, Kanchanaburi Province where the dominant forest types are dry dipterocarp and semi-evergreen forests. Bamboo of many species are abundant. This forest is situated at about 500 meters above mean sea level close to Myanmar border.

There are 4 villages, 244 households, with 1,127 populations which are both Musso and lowland Thai.

The total community forest areas of 3,350 rais are under the management of the community committee, which is under the supervision of a monk who is well respected by all the villagers. The surrounding forests which serve as watershed and NWFPs gathering are the semi-evergreen forest totally about 20,000 rais. Since the agricultural lands are very limited and unfertile, most villagers depend very much on NWFPs gathering such as bamboo, mushroom, edible and medicinal plants, tree leaves for roof tatching, and sugar palm.

The community committee received advice from the monk and the forest officials in managing their community forests. It is observed that water source is the vital component of the strong participation of the community in protecting and conserving these forests.
Study Methodology.
1. Interviews with the community members, using questionnaires.
2. Rapid Rural Appraisal (RRA)
3. Plant community study.

The criteria established for this survey are mainly focus on:
1. Resource availability.
2. Household consumption.
3. Technical support.
4. Job and income generation.
5. Marketing opportunities.
7. Economic incentive.
8. Environmental constraints.

The questionnaires and observation results are analysed to acquire information on the entire production and management system, from collection to processing, utilization and marketing to be used as a guideline for further project proposal preparation.

Results.

The survey results show that the average age of the population is 47 years, 57% are males; 43% are females. The population per household is ≈ 5. The main occupation is agriculture (90.79%). The average income is 30,315.79 Bath/annum. (minimum 2,000 Bath to maximum 200,000 Bath). The average income from NWFPs is only 863 Bath/annum.

The crop calendar shows that most of the NWFPs are abundant during April to October which is the rainy season.

The NWFPs collected and utilized by this community are:
1. Resin and Yang oil.
2. Bark.
3. Edible Plants.
4. Mushroom.
5. Spices and medicinal plants.
7. Rattan.
8. Edible insects.
9. Tannin and dye plants.

The quantities and values of each product are varied from year to year depending on the environmental conditions, such as yang oil valued about 24,721 Bath; barks of many tree species valued about 64,227 Baht; edible plants valued about 1,112,350 Baht which can divide into edible plants and fruits ≈ 274,508 Baht, mushroom ≈ 708,869 Baht, and bamboo shoots ≈ 128,973 Baht.

The cultivation of Kravan under shade in the natural semi-evergreen forest by the villagers produced about 5,481 kgs/year, valued about 1,096,202 Baht.
The collection of cinnamon bark from the natural forest amounted ≈ 9,809 kgs/year, valued about 367,830 Baht.

The collection of honey from natural forest amounted ≈ 5,521 kgs/year, valued ≈ 662,520 Baht.

The potential NWFPs by rank are:-
1. Kravan (Amomum krevunh)
2. Edible plants.
4. Spices and medicinal plants.
5. Mushroom.
6. Tree leaves for roof tatching.

The information about collection, processing, utilization and marketing of these NWFPs was presented at the workshop to be used as guideline for discussion and preparation of project proposal.

The possibility of sustainable management of each NWFPs depend very much on research and development strategies in the future.


Introduction

Pru Kanthulee was selected to represent the community forests in the southern part of Thailand by the advice of the Community Forest Division and the Suratthani Regional Forest office, because the area is not so big but the problem of forest land aggression is rather severe. It is recommended to be a good representative of the peat swamp forests which are quite generally occurred in the southern region.

The active participation of the local communities surrounding the forest, with the support of NGOs and forest officials to conserve this peat swamp forest for the benefit of the present and future generations attracted the pre-project to conduct survey here.

General Characteristics.

The Pru Kanthulee Community Forest is located at Amphur Ta Chana, Suratthani Province, about 15-18 meters above mean sea level. It is situated about 4 km from the seashore.

There are 2 villages, 213 households, with 981 populations, average 5 populations/household. They have been settled here for 70 years, 40% of the populations are migrants from other regions, and 60% are local peoples who expand there orchards to the edges of the peat swamp forest after settlement.

At present, there are only 875 rai of peat swamp forest left under the management of the community committee:
Most of the villagers depend on agriculture using water from the peat swamp, such as fruit orchard (34.07%), rubber plantation (37.54%), oil palm (14.61%), coconut (10.68%), coffee (0.32%) and other crops (2.77%).

The average annual income is 100,000-150,000 Bath/household per year.

In the past, this peat swamp forest stretched along the Petchkasem Highway for about 30 km. This forest had been aggressed by agricultural activities by clearing and draining out the water to use the land for crop cultivation. In 1982, there was a big fire spreaded over the dry peat swamp forest causing damage to more than half of the forest area. In 1989 the second severe fire occurred again causing dry out of many rice growing areas until farmers had to change to coconut and fruit orchards. It is estimated that there are 4,030 rai of land areas occupied legally or illegally at present. Some of the areas are left idled without any agricultural practices. During the last 4-5 years, attempts had been made to establish irrigation canal along sides of this forest to drain out water to the sea and to decrease the water level. The community committee was established to protest this activity, to prevent the aggression of the peat swamp. Nowadays, there are rules and regulations to conserve and manage this peat swamp forest, set up by the committee with strong support from some NGOs in the area. The nature conservation center was established at the edge of the peat swamp to render service to general public.

The climatic condition is as follow:

- **Average temperature**: 26.5°C
  - Minimum 22.4°C to Maximum 32.2°C
- **Average Relative Humidity**: 81%
  - Minimum 60% to Maximum 95%
- **Average rainfall**: 1,957.6 mm/year.
  - Highest rainfall in November 553.2 mm.
  - Number of rainy day = 133 days.

**Study Methodology**

1. Interviews with the community members, using questionaires.
2. Rapid Rural Appraisal (RRA)
3. Plant community study.

The criteria established for the survey focus on:

1. Resource availability.
2. Household consumption.
3. Technical support.
4. Job and income generation.
5. Marketing opportunities.
7. Economic incentive.
8. Environmental constraints.

Analysis of the survey and questionnaires was conducted to acquire information on the entire production system, from collection to processing, utilization and marketing to be used as guideline for preparation of project proposal.
The survey results showed that the evergreen forest in the peat swamp consisted of big trees of many species with the height of 20-25 meters, the crown canopy is rather dense with little light penetrated to the ground. The ground floor is deep peat in the inundated water all year round.

Lum Pee (Eleiodoxa conferta) is one of the well-known NWFPs in this area including Hed Samed (Grieseiptureus corner) a common mushroom in this forest type.

The most important role of this peat swamp is the water source for agriculture, especially fruit orchards surrounding this forest.

The NWFPs collected and utilized in this forest are:
1. Rattan.
2. Edible plants.
3. Mushroom.
4. Edible insects.
5. Roofing product.
6. Medicinal plants.

The quantities and values of each product are quite varied such as rattan in this forest is not much used because there is only one spp. of Daemonorops angustifolia which some people collect the shoots for food. The collection of edible plants is only for household consumption, except for Lum Pee, the quantities collected were $\approx 1,850 \text{ kgs/year}$ and sell after making prickle at 17-25 Baht/kg. The mushroom is commonly found and the amount collected was $\approx 1,175 \text{ kgs/year}$ and sale price is 30-40 Baht/kg.

The honey from Apis cerana was collected for sale at 150-300 Baht/bottle, the amount collected was 500-800 bottles per year.

It was observed that the production system was traditional using local wisdom, if appropriate technology is applied the sustainability management might be achieved.
The potential NWFPs by rank are:

1. Edible plants.
2. Mushroom.
3. Edible insects.
4. Roofing products.
5. Medicinal plants.

The crop and NWFPs calendar shows that most of them has some certain period of availability and the market of the products is only in the local market. It may need research and development strategies to sustainably manage these NWFPs for the future.