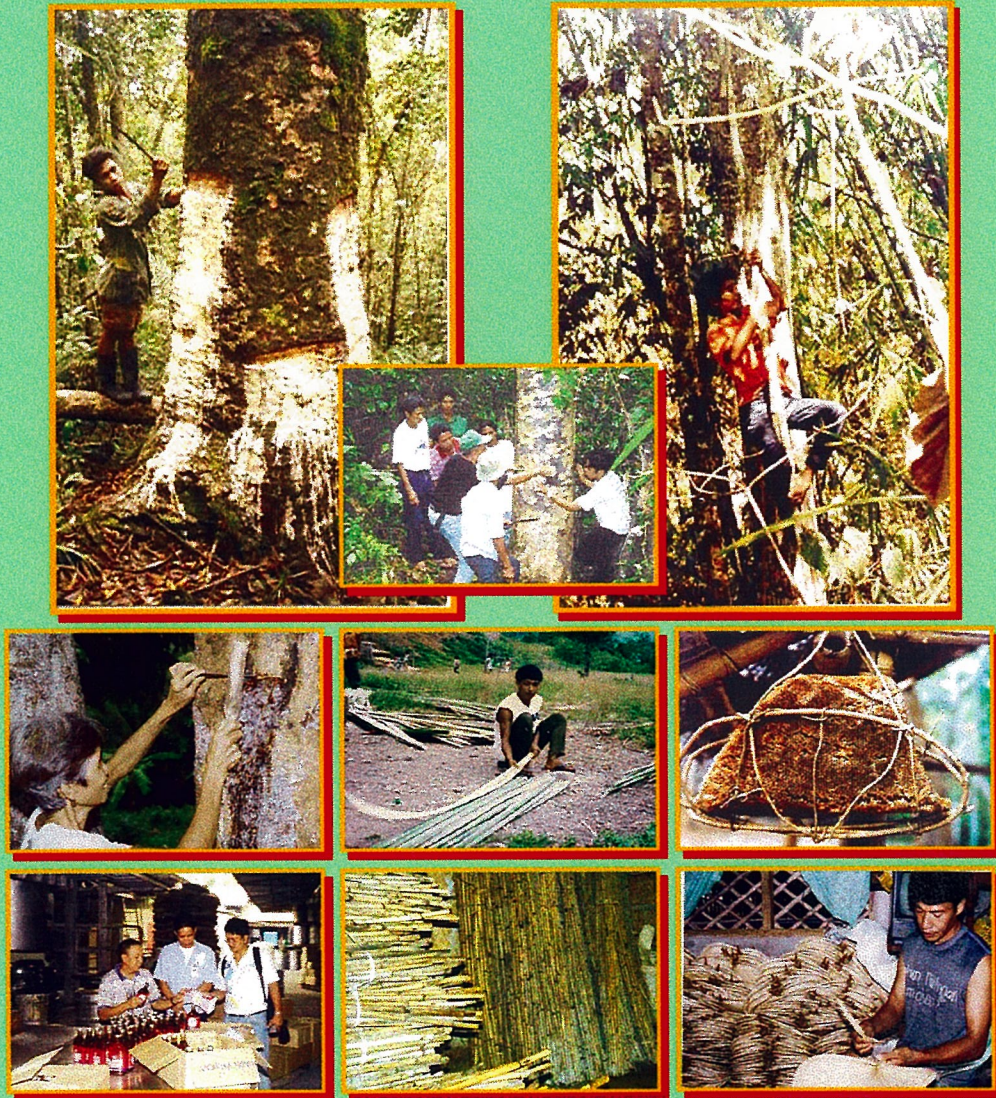


FPRDI-ITTO PROJECT PD 15/96 Rev. 2(M,I)

Study No. 2

ASSESSMENT ON THE COLLECTION, PROCESSING AND TRADE OF NON-WOOD FOREST PRODUCTS IN LOCAL COMMUNITIES

Terminal Report



Study Leader: A. B. Ella

Co-Researcher: I. M. Javier

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Yokohama, Japan

FPRDI-ITTO Project PD 15/96 Rev. 2 (M,I)

**UTILIZATION, COLLECTION AND TRADE OF TROPICAL NON-WOOD
FOREST PRODUCTS IN THE PHILIPPINES**

Study No. 2

**ASSESSMENT ON THE COLLECTION, PROCESSING
AND TRADE OF NON-WOOD FOREST PRODUCTS (NWFP)
IN LOCAL COMMUNITIES**

Terminal Report

Study Leader: A. B. ELLA
Co-Researchers: I. M. JAVIER and
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Project Leader: A. P. MOSTEIRO
Asst. Project Leader: A. B. ELLA

STUDY COMPLETION REPORT

A. Study Identification

Project Title	:	Collection, Utilization and Trade of Tropical Non-Wood Forest Products in the Philippines
Serial Number	:	PD 15/96 Rev. 2 (M,I)
Study Title	:	Assessment on the Collection, Processing and Trade of Non-Wood Forest Products in Local Communities
Study Leader	:	A. B. ELLA
Co-Researcher(s)	:	I. M. Javier A. L. Tongacan
Duration	:	Thirty-six (36) months

PART I. SUMMARY

1. Background Information of the Study

For many years now, non-wood forest products (NWFP) have been very important to our everyday living and have played a significant role in the development and growth of the material economy through the medium and small-scale industries engaged in the utilization of these vast forest resources for the manufacture of various items of commerce. The bamboo-rattan furniture and handicraft industries have been one of the major sources of livelihood for thousands of Filipinos specifically those in the upland forest communities who are forest settlers like the indigenous people. Other NWFP commodities like resins, palms, salago fibers, bamboos and rattan poles have generated income/export earnings for the country of about 1 M US \$ in the mid 1990's. Such figure may appear significant to the economy of the country.

Increased research on NWFP, their abundance, distribution, variation, ecology, reproductive biology, traditional and new method of propagation, cultivation and use, collection, processing, trade/identification of market and non-market value, etc. – an understanding of the manner of collection to processing, market and non-market value of non-wood forest products is indeed essential.

It is obvious that investigation have to be conducted on time which appears to have been neglected. In this regard, assessment on the collection, processing and trade of NWFP by local communities in

a residual forest of Luzon, Visayas, Palawan and Mindanao was carried out. Unfortunately, in the Philippines, these are often non-commercial yardstick for measuring the value of many of the NWFP used in the domestic economy of a rural community. Such investigation will, in a way, contribute toward improved management and sustained development of NWFP resources.

The study was carried out through surveys, training, and interviews of forest settlers engaged in the collection and utilization of NWFP at four project sites, namely: 1) Industries Development Corporation (IDC) in Casiguran, Aurora (Luzon Island); 2) San Jose Timber Corporation in Paranas, Hinabangan, Samar (Visayas); 3) Surigao Development Corporation (SUDECOR) in Carmen and Tago, Surigao del Sur; and 4) the Nagkakaisang Tribo ng Palawan (NATRIPAL) or the United Tribes of Palawan at its three project sites, viz., Kayasan in Puerto Princesa City and in Kampong Ulay and Punta Baja, both situated in Rizal town.

Primary data were collected through interviews of forest settlers and farmers, majority are indigenous people from indigenous communities, the traders, concessionaires, middlemen and the processors who supply finished or semi-finished products to exporters.

Secondary data were provided by the Department of Environment and Natural Resources (DENR), National Statistics Office (NSO) and holders of NWFP licensees and permits.

2. Study Achievements

a) Outputs Achieved

Data and information on the past and present situation of harvesting NWFP were gathered in four selected areas of the country representing the three main geographical regions of the country with the inclusion of Palawan. Problems of people engaged in the collection and utilization of selected NWFP were identified. In the same manner, trading and marketing of these NWFP were further documented through interviews and survey questionnaires.

Considering the bulk of NWFP in the areas studied, the forest settlers mostly indigenous people engaged in the collection of NWFP were trained to improve their technical skills along their line of practices and to adopt workable and sustainable procedures in the collection of NWFP especially in the case of *almaciga* and *Canarium* (*pili*) resins. The training provided them knowledge on the scientific system of tapping *Almaciga* and *Canarium* trees; rectify the crude practices in resin collection currently being practiced by tappers in the area;

and encourage these tappers to preserve the trees to enhance yields and improve resins quality.

An over-all impact of harvesting NWFP in the socio-economic conditions of the dependent communities was further discussed and presented.

b) Specific Objectives Achieved

Primary data and other information on the system or manner of collecting, processing, trading, and marketing of selected NWFP in local communities were documented through interviews, survey questionnaires, and photographs. Secondary data and the supplementary and related information were gathered from government cooperators like DENR and NWFP licensees and permittees and also from related and published technical reports and articles.

The actual needs and problems of forest dwellers engaged in the collection of NWFP were determined. The volume of NWFP and the income derived in the sale of selected NWFP were assessed in the four project areas/sites and in other selected areas with substantial stand of NWFP. Recommended improved technical skills in the collection of important NWFP.

c) Contribution to the Achievements of Development Objectives

For many years now, NWFP have been very important to our everyday living and have played a significant role in the development and growth of the national economy through the medium and small-scale industries engaged in the utilization of these forest resources for the manufacture of various items of commerce. Beneficiaries of the results of the study are farmers and forest settlers, NWFP licensees, permittees, entrepreneurs, community organizers and end-users.

The cooperation of the government sectors, logging/wood industries e.g. SUDECOR (Surigao Development Corporation) and IDC (Industrial Development Corporation) and NWFP licensees, and permittees and NGO like NATRIPAL (Nagkakaisang Tribo ng Palawan) and ICDAI (Infanta Integrated Community Development Assistance, Inc.) and active participation of their forest settlers in various training conducted has been very helpful in the attainment of the objectives of the study.

3. Target Beneficiaries Involvement

Farmers, forest settlers mostly indigenous people, NWFP licensees and permittees, traders, and handicraft entrepreneurs using NWFP are the primary beneficiary of the study especially of the technology on scientific tapping of *Almaciga* and *Canarium* resins. Most of the participants in the interview schedules were very accommodating and cooperative in the process of providing data and other information. In the same manner participants in the training courses showed actively in the discussion and have presented problems they have encountered in tapping resins as well as in the marketing. Somehow, the participants showed enthusiasm to learn by actively participating in the classroom discussion and by actively participating in the “hands on” and practicum exercises of the training.

4. Lessons Learned

a) Development Lessons

The current operation of DENR, NRMP and ITTO and NGO run projects in the areas surveyed and studied were instrumental in the successful implementation of the study. The interaction and cooperation of community development officers, training facilitators, barangay officials datu/chieftain among indigenous people, and military officers especially in areas where peace and order is a problem played a vital role in the interview and data collection as well as in the documentation of their activities.

Marketing of NWFP both processed and raw materials had been found to be the key problem among forest settlers like the indigenous people who live in remote and wilderness areas.

In this regard, full assistance to the farmers, forest settlers and indigenous people in trading and marketing their collected raw materials as well as finished products should be provided. Whereas, impact assessment and monitoring of previously conducted training on harvesting of selected NWFP should also be carried out. This would ensure the sustainability of NWFP production and improve their quality.

b) Operational Lessons

In the beginning some minor problems were encountered in the implementation of the project, viz: inaccessibility of some identified sites at SUDECOR due to presence of militant forest settlers especially the Manobo tribes and their unwillingness and negative attitudes to be interviewed; and delayed issuance of Environment Compliance Certificate (ECC) by DENR to IDC in Aurora to operate.

However, data gathering and conduct of training in the areas was somehow carried out favorably with the able assistance of some government agencies, e.g., DENR, DILG (through their military men assigned in the areas surveyed) and also the NWFP licensee and permittees operating in the areas concerned.

Study Documentation

Reconnaissance survey of project sites prior to study implementation was conducted and has been found to be very useful. Questionnaires, photographs, publications and previous/old data on the old practices of harvesting NWFP as well as their yield and production were very helpful in the process of documenting and impact assessment of training conducted on harvesting NWFP specifically resins in selected areas.

Monitoring and Evaluation

Other identified areas found within the four major project sites especially indigenous communities were inaccessible, hence, hindered in the data gathering.

Quality of Study Planning

The quality of study planning was well organized. With ample time still available some other places were also visited where NWFP are abundantly found, collected and utilized by indigenous communities.

External Factors That Influence Study Implementation and That Could Have Been Foreseen

SUDECOR, IDC and SJTC do not have major processing activities for NWFP in the concession areas. In the same manner, trading and marketing activities of NWFP were carried out outside the concession areas. Meanwhile, processing of resins into varnishes, paints and other products were all observed and documented in Cebu City. Identification of indigenous communities, traders and processors of NWFP were carried out during survey and field visits in the project sites. This was facilitated with the assistance of DENR, DOST, DTI, Local Government Units (LGU's) and Non-Government Organizations (NGO).

5. Recommendations

Based on the findings of the study, the following are therefore recommended for possible improvement of future related studies:

- Sustain the enthusiasm of the forest settlers especially indigenous people

Though impact of collection, processing, and marketing of selected NWFP have much significant results in the socio-economic conditions of the dependent communities, still these people are looking for more benefits specifically in alleviating their social status. The government through DENR, LGU, logging concessions, NWFP licensees and permittees should work hand in hand in order to find a smooth way to sustain a program. DENR should enrich their program like Community Based Forestry Management Office (CBFMO) - Natural Resource Management Program (NRMP) in these areas to assure the forest settlers especially indigenous people that the concern of government is strongly there.

Further, there should be a close coordination among various sectors of NWFP collectors and processors and government and private agencies. Moreover, there should be a strong tie up between these sectors and indigenous people for morale booster and further enhance support for stronger marketing of their products.

- More trainings on proper collection of NWFP

Seminar/training should be the optimum linkage to impart technical knowledge to forest settlers. If possible, the government should forge more linkages with other government agencies and NGO so that appropriate training and formation activities on the importance of NWFP collection and utilization which at the end pave the way for more employment opportunities in the indigenous communities.

- Marketing Needs

It is necessary to get in touch with market outlets and NWFP buyers to help them in the marketing of their extracted forest products and other products they produce.

In the same manner, more market surveys should be initiated to determine which of these NWFP have a strong market potential.

It is likewise recommended to study the possibility of establishing forest settlers marketing cooperatives. This could be viewed as an organized vehicle for soliciting active and direct participation of the forest settlers in which majority are upland dwellers.

Communication with proper authorities viz., to provide escorts and interpreter as well while conducting field works in upland areas of indigenous communities to assure better and smooth flow of research activities.

PART II. MAIN TEXT**1. Introduction**

In the Philippines, the forest has always been an integral part of the people's traditional living. Yet, the dependence on and relationship of people most especially the forest settlers/occupants or upland dwellers with the forest have been undergoing significant changes. The changes could be attributed to the enormous depletion of forest resources like timber and non-timber forest products.

Recent report states that about 17.8 million upland dwellers in the country are dependent on forest resources like non-timber forest products for their living. This population is expected to increase to 27 million and 44 million in the years 2005 to 2025, respectively, due to high percent growth rate (2.6 percent per annum at present) plus the incident of high migration in the upland areas (Calanog, 1991).

For many years now, these non-timber forest products have been very important to our everyday living and have played a significant role in the development and growth of the material economy through the medium and small-scale industries engaged in the utilization of these vast forest resources for the manufacture of various items of commerce. Moreover, said industries provide employment opportunities to thousands of people. In 1993, the aggregate export earnings of the country from selected non-timber forest products, e.g., almaciga resin, Manila elemi, bamboo, rattan poles and salago fiber amounted to US \$ 937,000. Such figure may appear significant to the economy of the country.

Considering the economic value of non-timber forest products, there are various high priority research areas in this field that have to be considered. Mauricio (1989) focused more on the forest occupants/upland farmers responses and behavioral attitudes on the establishment of Integrated Social Forestry Projects in their communities. The same holds true of the works of Calanog (1983) and Mauricio (1990) about Mt. Pulog inhabitants and degrading hilly lands occupants which concerned their socio-economic status and responses to various government projects and programs. A more comprehensive study on socio-economic impact is not available.

In the neighboring south Pacific Island of Vanuatu, Olsson (1991) revealed that the island is losing various non-timber forest products owing to changes in resource exploitation. Many villagers claimed that forest fauna, particularly birds, had disappeared after logging and re-logging. In other cases, with the increased importance of a cash economy, many of the traditional forest products are being abandoned owing to their relatively low monetary value, even though they are still seen as important. However, the costs of acquiring through cultivation and cash purchase all the products that are

currently obtained from the forest would be considerable. In addition, poor people who depend most heavily on the non-timber forest products would be affected with disproportionate severity.

Increased research on non-timber forest products, their abundance, distribution, variation, ecology, reproductive biology, traditional and new methods of propagation, cultivation and use, collection, processing, trade/identification of market and non-timber forest products are so closely related to ecological, economic and socio-cultural conditions, most researchers will need to be location specific.

It is obvious that studies and research have to be conducted on time which appears to have been neglected. In this regard, assessment on the collection, processing and trade of non-timber forest products by local communities in a resident forest of Luzon, Visayas, Palawan and Mindanao is therefore, important aspect for investigation. An understanding of the manner of collection and processing, market and non-market value of non-wood forest products is essential. Unfortunately, in the Philippines there is often non-commercial yardstick for measuring the value of many of the non-timber forest products used in the domestic economy of a rural community. Such investigation will in a way contribute toward improved management and sustained development of non-timber forest resources.

2. Materials and Methods

A. Materials

- survey instruments (questionnaires/interview schedule)
- cassette tape recorder
- camera
- binocular
- films (slides, photoprints)
- pocket calculator
- pamphlets (English and Pilipino)
- audio-visual aids/flip charts
- plastic squeeze sprayer (one pint capacity)
- chemicals (sulfuric acid)
- polyethylene plastic bags
- masks and gloves

B. Methods

1. Negotiation/meetings and coordination with involved parties

Proper coordination with cooperating government and private sectors, e.g., DENR and holders

of NWFP licensees and permits. Local and barangay officials, datu/chieftains were contracted and informed them of the proposed study in their respective area. They were likewise briefed as to the importance, objectives and activities to be carried out in the study.

2. Survey and site identification of areas engaged in the collection, processing, utilization and trade of NWFP.

There were criteria sets for determining the project site, viz.:

- a pre-survey of the forest concessions where perspective pilot area was carried out in different places of Luzon, Visayas, and Surigao in Mindanao and Palawan. The survey assessed the number of communities and people engaged in the collection and utilization of NWFP.
- availability of sufficient NWFP in the area which are collected and utilized by forest dwellers as source of living.
- existence and availability of local market (buyers in the area)
- cooperation and willingness of dwellers to support the study.
- accessibility of the area
- strong support from involved parties, e.g., government agencies, private industries like cottage industries and/or local government officials; and
- favorable peace and order situation of the area.

3. Properties of research instruments

This involved the preparation of questionnaires, interview schedules and data sheet for gathering of information on the collection, processing, utilization and marketing of NWFP in a given community.

4. Pre-testing of some research instruments

The interview schedule of NWFP gatherers were pre-tested first among at least thirty randomly selected

forest occupants/upland farmers and of local populace living adjacent to the residual forest and study sites prior to actual implementation. In this occasion, pre-testing of some research instrument was held in Barangay Dibacong, Casiguran, Aurora Province. The area is under the jurisdiction of IDC whose people was also dependent on NWFP for their living.

5. Data gathering activities/actual interview of villagers directly involved with gathering, processing, utilization and marketing of NWFP at four project sites

In the course of interview, harvesting, handling and processing techniques on selected NWFP was likewise evaluated. Improved harvesting, handling and processing techniques were also imparted in form of holding seminar-trainings.

6. Preparation of Pamphlets

Four pamphlets, in English and in Pilipino which cover the scientific and proper techniques in tapping almaciga and canarium species were prepared. These served as a guide for the participants in the course of the training program. A module and outline of the training course were also prepared. The module was simplified to suit the needs of the participants in the various areas that were visited.

In the same manner, audio-visual aids on the various aspects of the course were also prepared to fully support the attainment of the objective of the training/seminar workshops.

7. Schedules and Conduct of Training Program

The conduct of the training program was coordinated with DENR, DILG, and NGO's like NATRIPAL and ICDAI and NWFP's licensee and permittees. The coordinators in each training program presented the overview and rationale of the course.

Lectures were presented with tagalog-english as a medium of instruction which were further translated into the dialect of the natives by local representative in each training program. This is followed by an open forum which was actively participated by the group indicating a high level of interest on the subject matter.

Certificates of completion were awarded to the participants who completed the course.

3. RESULTS AND DISCUSSION

A. Industries Development Corporation (IDC)

Casiguran, Aurora Province

Brief Description of the Project Site

IDC is a 100% Filipino owned corporation duly organized under the existing laws of the Philippines. The Industrial Forest Management Agreement (IFMA) areas are located within the municipalities of Casiguran and Dilasag, Province of Aurora, which form part of the Sierra Madre Ranges and extend towards the shoreline of the east. The terrain is generally rugged and mountainous, with approximately three-fourths of the total land area forested while the remaining is devoted to farming and settlement areas. Soils are generally young, having been formed by an uplifting mountain landscape. Major watersheds have been identified and found to have signs of minimal degradation due to kaingin making and other land development activities.

The scope of the project includes at least four local communities (barangays) namely: Bosok-Bosok, Dimpalan and Cozo all in San Ildefonso Peninsula and the other one was in Calabagan in Casiguran.

Four ethnic minority groups, namely the Dumagats (Negritos), Ilongots (Bungkalots), Baluga, and Igorots comprise the indigenous communities found within IDC areas. Other names that Dumagats go by are: Ita and Agta.

Dumagats survive by hunting (September to January) and fishing (April to August), while some hire-out and others engage in NWFP collection like rattan, vine and anahaw leaves and poles and almaciga resins, and also in handicrafts manufacturing. Dumagats adhere to traditional worldviews regarding land, and that is, of land being a common heritage. Such a perception prevents the Ita from asserting claims. In cases of land disputes among Dumagats, a chief settles the conflict among them unlike the Igorots and Ilongots who resort to court actions.

Collection of NWFP in IDC

Non-wood forest products abound in selected sites of IDC areas include rattan, nito sabutan, woody vines, pandan, buri, erect palms like anahaw and occasionally almaciga resins. The indigenous people especially the Dumagats or Itas share their practices of extracting NWFP with the other migrants from neighboring provinces like Quirino and Isabela.

The Dumagats at IDC areas operate as collectors of NWFP under one association the so-called "SAKADA" or Samahan ng Katutubong Dumagat sa

Aurora. This is an organization by Dumagats found in the municipalities of Dinalungan, Casiguran and Dilasag dwelling at approved CADT (Certificate of Ancestral Domain Title) with 91,000 hectares area. They also act as an "eye" for all the activities/transaction being carried out by IDC. The principal objective of SAKADA is to safeguard, protect and conserve their ancestral lands. There are about 120 household members of the association. Most of these forest settlers relied on IDC's forest resources especially NWFP i.e., rattan, erect palms, bamboo, and occasionally honey and almaciga resins.

Rattan

The Dumagats follow the traditional system of collecting NWFP. In gathering rattan for instance at least two members of the family would go to the forest for a week period and collect the desired volume of rattans they agreed upon with the "kapatás." Normally they are in group of ten to twelve rattan gatherers who collect rattan in the forest. Usually, the "kapatás" is responsible for the supply of food like rice, sardines, noodles and even "drinks" and cigarettes to sustain these gatherers for a period of at least one week while out there in the forest or cash advances are made by head of the family and leave part of it to the family prior to a week forest camping. The cash advance is deducted from the payment of products collected. From observation and interview, it was found out that a Dumagat rattan gatherer normally collects 50-100 pieces per day of assorted rattan species, i.e., palasan, limuran and gatasan at nine to ten ft. long and sold them at ₱ 2.00/pole. The gatherers transport rattan poles from the cutting sites to pick-up site by foot, and occasionally by carabao skidding. From pick up site, the gatherers bring the poles to Dibacong, a barangay where IDC compound is located. Others opted to transport their collected NWFP in the highways of Casiguran town, making used of IDC's dumptrucks.

SAKADA follows certain flow of rattan processing, viz., sorting, scrapping, splitting and round core production.

A rattan gatherer normally earns ₱ 500.00/week. A buyer comes weekly to pick up and transport rattan poles either to Baler, the capital town of Aurora or Cabanatuan City in Nueva Ecija. A gatherer earns an average of ₱ 2,000.00 to ₱ 3,000.00 per month from sale of rattans.

Observation and interview of Dumagat rattan gatherers show that rattan poles are classified according to sizes or diameters and do not give emphasis on species. Prices are based on the length and diameter of the species.

At present, there is only one existing rattan permittee in Aurora province with authorized cuts of 234,721 lineal meters with specification below two cm diameter; and 67,848 lineal meters at two cm diameter and larger. However, as of July 2000 the manifestation of rattan production for this permittee was only 81,569 lineal meters for the one year duration of permit. These were cut and gathered within the licensee area located at Casiguran and Dinalungan, Aurora.

Almaciga Resin

Records show that there was once an almaciga resin licensee that operated in the area with approved annual SYC or quota of 50,000 kg/year granted by DENR. Unfortunately, the licensee manifested only 3,000 kg for the entire duration of permit which eventually stopped its operation in 1999. The licensee never renewed its operation due to poor trading and marketing of resins. Moreover, almaciga resins collected in this area have more insolubles, and this is not suitable for varnishes and paints manufacture.

Anahaw Leaves and Poles

Collection and utilization of anahaw (*Livistona sp.*) leaves and trunks, buri and vines are common part time source of living by inhabitants living in San Idefonso Peninsula, an area of IDC. The forest settlers of Pasunoboi in Bosok-bosok with a population of about 400 inhabitants and 80 Dumagats; and Barangay Cozo with approximately 3,000 people, 300 of which are Dumagats resorted in the collection of NWFPP specifically anahaw leaves where local people call it "rayray." Dumagats revealed that they collect and sold it at ₱ 20.00 per bundle (fifteen to twenty pcs./bundle). But collections of said item are on order basis only. The gatherers bring the anahaw leaves from the forest to the stockyard in their house where buyers pick them up and transport them either to Baler, Cabanatuan City or Gumaca, Quezon. They are usually made into roofing of resort cottages and rest houses in nearby provinces particularly in Pangasinan. Dumagats earn an average of ₱ 200.00/month out of collecting anahaw leaves. On the other hand, the non-Dumagat settlers in the Peninsula concentrate on vines (*Freycinitia spp.*) buri and anahaw leaves collection and utilization. Majority of them are migrants from mainland Quezon Province, specifically Lopez where they acquired their skills in weaving vine crafts and fan weaving. Though seasonal or while waiting for the harvest of their farm crops, forest settlers resorted to fan weaving and other decorative decors using buri and anahaw leaves where buyers pick them up on monthly schedule. Finished products are transported by buyers/traders to Manila for domestic and export purposes.

Prices of Finished Products (Anahaw/buri leaf fan)

Prices of anahaw/buri fan depend on season, viz., during summer, a fan costs ₱ 2.50 a piece, while during rainy season one costs only ₱ 1.50.

Minimal expenses are involved in fabricating raw materials into finished products, like in the case of anahaw/buri fan, i.e., hiring of skilled weaver (maglalala). A weaver or "maglalala" of fan is paid ₱ 20.00/100 pieces of weaved anahaw/buri fan. Majority of the weavers are women who can finish an average of 200 pieces of fan per day for an eight hour working period. On the other hand, a fixer of fan handle is also hired at ₱ 15.00/100 fan handles fixed. One can fix at least 250 handles a day for the eight hours working period. One family showed that they could generate an average of ₱ 4,000.00 per month income from sales of these fancies anahaw/buri fans. Majority of the respondents are farmers who found that this backyard industry

offers a more lucrative source of income for them considering the bulk and abundance of the free raw materials around.

Processing involved in fan making are as follows:

- 1) raw materials collection
- 2) drying
- 3) initial/preliminary weaving
- 4) tightening of edges
- 5) final weaving
- 6) fixing of handles

Gatherers of anahaw leaves are paid ₱ 0.50/leaf collected which they brought them down from the forest to the weaver's house by foot and occasionally by carabao skidding.

The frequency of collection is once a week with an average extraction of 1,200 pieces of mature anahaw leaves per month. At least two mature anahaw leaves are collected per tree per harvest time. The remaining leaves are reserved for the next collection.

Data on vine collection and its utilization especially that of white vine (*Freycinitia spp.*) was not observed because the people involved in this activity were not around at the time of visit in the area. The Barangay Captain of Barangay Cozo in the Bundok Peninsula area further explained that production of vinecrafts temporarily stopped due to products' decline demand in the market.

Other NWFP collected by IPs in the area include bamboos (bolo species) where Dumagats sold them at ₱ 8.00/pole at twelve ft long to some handicrafts entrepreneurs. But in the case of IDC as buyer, the Dumagats sold them at ₱ 5.00/pole for reason that IDC gets bigger volume at 5,000 pcs of bamboo poles every three months for rafting purposes of their logs. Though collection are seasonal and on order basis only, yet forest settlers are more than satisfied of the extra income they get from sale of bamboos which they harvest from their backyard, a CADT grant area, free of charge. Like other NWFP, bamboo poles are transported from cutting site to Dibacong, IDC either by carabao skidding, jeep or IDC dumptrucks whenever roads are passable. Occasionally, however, Dumagats attributed to water transport either by hauling with raft or just let bamboo float freely to reach riverbanks of Dibacong. Transport facilities all depends on the distance, topography and road characteristics of IDC areas.

A Dumagat farmer earns an average of ₱ 3,000.00 per month from sale of bamboos. Cutting/gathering and transportation cost of bamboo from cutting site to IDC is minimal. Gathering of bamboos are often times carried out by Dumagats themselves and seldom hire for labor. If in case they hire labor for cutting/gathering bamboos they just charge ₱ 1.25/pole.

Hiring of bamboo cutters depends on the volume of bamboo poles to be harvested. If the recipient of bamboos is IDC, which require bigger volume of bamboo per quarter, then it is only normal to get extra gatherer for every 120-bamboo pole. Transportation cost is likewise minimal since oftentimes, IDC trucks are used to transport the collected bamboos from cutting site to Dibacong.

Other important NWFP found in IDC areas are almaciga resin, honey, orchids and game animals, e.g. wild boar and deer.

Extraction of almaciga resins was only temporary owing to non-regular showing of buyers to get the resin.

Collection of honey, orchids and game animals are minor and seasonal only but profitable activities for Dumagats and other indigenous people living in the IDC areas. Interviews done during the conduct of this study as well as data gathered from SAKADA (Samahan ng Katutubong Dumagat sa Aurora) headquarters in Cabangan indicate that a Dumagat earns ₱ 2,000.00 per month from sale of honey during peak season with ₱ 100/bottle of one liter. Orchids like fire and butterfly varieties are sold at ₱ 10.00 and ₱ 20.00 a piece respectively to nearby neighboring towns of Baler and San Luis. Dumagats known for their very good hunting skills also augment income from the activity.

Others Source of Income by People

Because of limited source of income in San Idelfonso Peninsula area especially in the two Barangays of Cozo and Bosok-Bosok, the inhabitants both IPs and non-IPs, resorted to extraction of tops and branches including stumps of previously cut narra and tindalo. The Dumagats did the digging of old narra and tindalo stumps. They are paid ₱ 5.00/bd. ft. of delivered semi-processed stumps with dimensions of 70 cm x 25 cm x 25 cm (LxWxH). Some resorted to carabao skidding but majority transported the collected stumps by foot, about six to seven km. from collection site to pick up site in Barangay Cozo. Most of the time, these Dumagats just bartered their wood blocks into rice, sardines, dried fish, "drinks", cigarettes and other commodities with the buyers in Cozo. Normally, a Dumagat can deliver fifteen pieces of narra or tindalo stumps per month to its traders. From Cozo, the collected stumps are transported and sold to some traders in Didiawan, Dinalongan, Aurora at ₱ 12.00/bd. ft. and these are further processed into wood tiles.

Problems Encountered by People with Regard to Extraction of Selected NWFP

- 1) Very poor marketing system for collected NWFP due to poor road conditions and transport/facilities.
- 2) Unawareness of preservative treatment of rattan, bamboo and palms to minimize rejects brought by stains, molds insect attack and other factors that causes biological deterioration.

- 3) Delay issuance of permits and processing of papers by government agencies concerned like DENR to collect and transport NWFP.
- 4) Poor communication facilities.
- 5) Insufficient forest extension officers to conduct seminar/training on sustainability of forest production and utilization and awareness on basic knowledge on the nature and causes of deterioration by fungal and insect attack in NWFP and other forest resources.

B. San Jose Timber Organization (SJTC)

Brief Description of the Project Site

The four project areas and respondents covered the Barangays of Cantato, Casandig I and II, Lauan I and II, Tenani all within the municipality of Paranas (formerly Wright); and Concord and Cansulabao in Hinabangan, Western Samar. It is situated inside the forest concession of the San Jose Timber Corporation (SJTC) and under the jurisdiction of CENRO Catbalogan and PENRO Western Samar. Lauan and Concord are about 50 and 65 km respectively from the capital town of Catbalogan and are accessible to all types of land vehicles through a gravel road. Paranas and Hinabangan are bounded on all sides by public forest lands. Except for the San Jose Timber Corporation whose logging operation stopped due to the imposition of the logging moratorium for Samar, there are no other existing TLA's in the area.

The forest vegetation is biologically diverse. The forest is dominated by lowland and lower hill Dipterocarp species such as Mayapis [*Shorea squamata* (Turcz.) Dyer], Tanguile [*Shorea polysperma* (Blanco) Merr.], Almon [*Shorea almon* Foxw.], Red lauan [*Shorea negrosensis* Foxw.] and Yakal-gisok [*Shorea gisok* Foxw.] and Apitong species (*Dipterocarpus spp.*) which are being unscrupulously tapped by people for balau resin yield.

The most prominent non-dipterocarp species is almaciga [*Agathis dammara* (Lamb.) Rich.] whose diameter reaches up to more the 200 cm. This species was not cut by the SJTC because of an existing cutting ban for almaciga. However, it is being extensively tapped by local residents for its valuable resin.

The under story is densely covered by NWFP viz., rattan, pandan, forest vines, erect palms, herbs, brushes and wildlings.

There are no cultural communities within the project areas covered. Almost all of the people (98%) are Warays while the rest are Cebuanos, Tagalogs and Manobos.

COLLECTION OF NWFP IN SJTC AREAS

Observations and interviews done as well as data gathered from DENR files and also literature indicate the existence of numerous forest products in the project sites which are presently utilized for various domestic purposes and have considerable potential as raw material for other uses. Moreover, residents in the barangays studied are engaged directly and indirectly in logging and lumber processing, harvesting of rattan, gathering of firewood and collecting of various forest products such as resins from almaciga and apitong, abaca stalks, anahaw leaves, vines, pandan (bariw) and wild game. Among the NWFP mentioned, collection of rattan, almaciga and balau resins from apitong are the most important for the local residents.

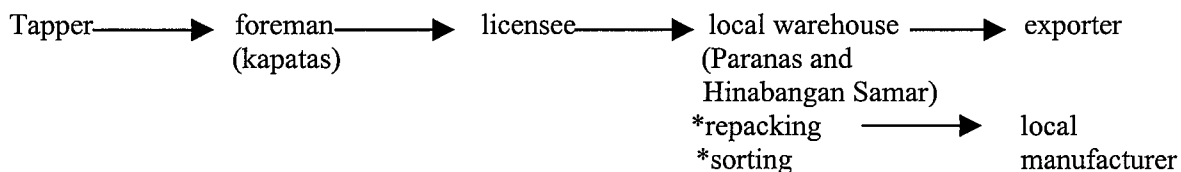
Almaciga Resins

There are four almaciga resin licensees presently operating within the SJTC areas. Three of the licensees have each 50,000 kg approved quota (Annual SYC) while the other has 75,000 kg. Almaciga resin license is valid and renewable every year. Almaciga collection and trade in Samar follows the system of cash advance payment commonly practiced in the collection of other NWFP's. The licensee gives advance payment to the "kapatás" (foreman) who uses this to buy consumables, e.g., rice, sardines, cigarettes, etc. needed by resin gatherers during their camping in the forest in the course of tapping and collecting resins. Sometimes, portion of the cash advance payments are left in the family for their week's supply while the father or son are away extracting resins. The corresponding values of the consumables are all deducted from the final payment for the resin collected.

Tapping almaciga is physically taxing. Steep slopes have to be scaled to reach almaciga trees growing at elevations from 200 to 2,000 m above sea level. Tapping itself requires strength to be able to make deep cuts on the bark.

In Samar, each tapper covers an average of 250 trees. In one day, he taps between fifteen to twenty-five trees. This is the reason why tappers spend time to hold camping in the forest in the course of tapping and collecting the resins. Equipped with sharp bolo, the tapper makes four to five cuts on each tree depending its size. The resin is collected after thirty days (harvesting cycle) and with a cutting cycle of fifteen days. About fifteen to twenty kilograms of resins are harvested per tree tapped per month.

Below is the Movement/Flow of Resin



* Major activities carried out in the local warehouse.

The resin is bought by the licensee or concessionaire from the gatherer at a price of ₱ 8.50 per kg (including trucking fee of ₱ 0.50 per kg). Meanwhile, the licensee receives ₱ 13.00 per kg when he sells almaciga resin to the final buyer in Cebu. Resins are processed into local varnishes, paints and other products for consumption by furniture and handicraft industries in the Visayas and Mindanao areas.

Handling and Transport of Almaciga Resins

In Samar, almaciga resins are collected and transported by tappers from the forest to “kapatas” or directly to licensee either by foot, carabao skidding or by jeep or tricycle hiring at designated places. However, most of the time roads are not passable and some places are inaccessible by any form of vehicle, hence, tappers resorted to hike all the way from the forest to pick up site with a forty to forty-five kg resin placed in an improvised rattan woven containers known as “katupis” slung on their back. These are the collected resins done for a week period time.

Resins delivered by gatherers/tappers to concessionaire’s warehouse are sorted/graded according to its cleanliness and sizes. Unnecessary materials like stones, insects, dried barks and leaves and other impurities are segregated during sorting/grading process. Afterwards, repacking followed wherein sorted and graded resins are put in clean sacks ready for transport to Cebu. Labor expenses for repacking resins are pegged at ₱ 100.00/day/person.

Transportation Expenses

Almaciga resin concessionaires in Samar haul their properly cleaned and repacked resins either by cargo truck or container van initially from Hinabangan and Paranas, to Tacloban City at ₱ 15.00/sack. A person is paid ₱ 100.00 a day to load sacks of almaciga resin into the cargo truck or container van.

In Tacloban City, another group is hired to unload and transferred the sacks of resins from the cargo truck to the ship at ₱ 2.50/sack. Fare for the resins in the ship from Tacloban City to Cebu City costed at ₱ 25.00/sack. Unloading of these sacks of resins in Cebu Pier amounted to ₱ 3.50 per sack. Contact buyers of resins in Cebu provide transportation to haul the resins from the pier to the warehouses. An estimated transportation expenses of ₱ 12,000.00 per shipping of 250 sacks of almaciga resin is incurred and a forest charge of ₱ 1.00 per kg of resin.

Other expenses incurred are the money given to three integrated checkpoints, i.e., DENR, PNP, etc. found along Catbalogan, Samar and Tacloban City areas at an average cost of ₱ 5,000.00 per trip. On the other hand, the Philippine Port Authority and the Philippine Customs get ₱ 7,500 as transport and other miscellaneous fees at a rate of ₱ 20.00 per sack of resin. An average of 250 sacks or 12,000 kilograms of resins per month are shipped by each of the four licensees in Samar.

For the average 250 sacks shipped, a concessionaire gets a net income of about ₱ 65,000.00 per shipping after deducting the principal capital, transportation and other expenses involved in the course of handling and transporting the resins.

Tapping System

Observations showed that Almaciga resin tappers in Samar followed the very crude and unscientific system of resin collection. In this regard, a technical training on scientific and correct tapping of almaciga was conducted by FPRDI-ITTO project personnel which were backed up by the CENRO-DENR, Catbalogan Samar.

The Training

Two pamphlets which cover the different topics on the proper techniques in tapping almaciga were followed and disseminated to participants throughout the duration of the training. These served as guide for the participants in the course of the training program. An outline/module of the training course and a program were also prepared both in English and in Filipino. However, the program was modified depending on the locality and need of the participants in the various areas that were visited.

The seminar-training was conceived to rectify the crude and unscientific system of resin collection currently being practiced by tappers in the area. The training was also envisioned to encourage almaciga tappers to maintain and preserve almaciga tree when they are abandoned. Participants noted that the topics and technologies are very useful to them. They also became interested in saving the trees, enhancing resin yields and improving resin quality.

The training was first conducted in Hinabangan, Samar for tappers of Mr. Maximino Teczon and Ms. Narcisa Teczon with about thirty participants including observers. Two days later, the trainers moved to Paranas about fifty km. from Hinabangan to train Ms. Beatriz Uy's almaciga tappers, barangay officials and other observers covering twenty participants.

The seminar consisted of both classroom work, i.e., lecture-discussion and visual aid presentation, and field demonstration and exercises where the participants practiced doing the current tapping procedures.

Lectures were supplemented with handouts, illustrations and tapping materials such as bark hacks or razor-sharp bolo and sulfuric acid in plastic squeeze sprayer.

To facilitate communication, tagalog and english were employed as medium of instruction. DENR representatives translated some terminologies in the lectures into the waray dialect. An open forum followed every lecture session.

The problems encountered by the participants which surfaced in the discussions were as follows:

- the legal framework surrounding almaciga utilization
- handling, cleaning, grading and marketing of collected almaciga resin;
- acquisition of necessary tools, materials and other paraphernalia in tapping almaciga and
- scientific practices in almaciga tapping

Processing of Almaciga Resins

Almaciga resins obtained from Samar are directly shipped to Cebu City for processing into varnishes, paints and plastics. At present, there are three processors of these products in Cebu, i.e. Treasure Island Industries Corporation (TIIC), Styropor Philippines, Inc., and Anson Chemical Products. However, only TIIC was kind and cooperative enough to accommodate interviews, survey and visit their processing plant in Cabangalan, Mandaue City.

TIIC also obtained their raw materials (almaciga resin) from Palawan. They consumed an average of 20,000 kg per month or 4,000 to 5,000 kg/week of almaciga resin in their operation. TIIP produced 12,000 bottles (375 cc each) per day and sold them at ₱ 16.65 per bottle. Aside from the natural varnishes, TIIP also produced colored/dyed varnishes. For varnish manufacture, TIIP employs thirteen personnel for one working period (eight hours). Varnishes produced from Samar almaciga resins are characterized by being glossy but longer drying time. On the other hand, varnishes from Palawan resins exhibited brittle but lesser drying time. Visayas and Mindanao areas are the only market for TIIC products, yet the industry is peaking up.

Processing of Kamangyan (frankinsence)

In the past Ms. Beatriz Uy, a concessionaire of almaciga resin in Paranas Samar, had tried processing of kamangyan from almaciga resin. The product was popularly used as incense and very important material in any religious ceremonies among devoted Christians. The processing techniques were not observed neither documented because at the time we visited the area the home-based industry was no longer in operation. Former workers revealed that kamangyan business existed only for one year. Initial products were all shipped to Manila and Cebu for field test. However, production of such stopped due to poor marketing and non-preference by clients.

Tapping of Balau Resin from Apitong and Other Related Dipterocarp Species

The forest vegetation of SJTC is biologically diverse. The forest is dominated by *Dipterocarp* species. Considering the bulk of dipterocarps in the area, the people especially forest settlers resorted to tapping of resins not only from almaciga (*Agathis dammara*), known to be the most prominent non-dipterocarp species in SJTC area but also from apitong and other related species like yakal.

Collection of balau resin is still considered illegal since the government, i.e., DENR does not issue permit for its collection.

Balau, a sticky and thick gummy substance when mixed with other materials is used for caulking boats. To some extent it is also used in medicine as mild stimulant, disinfectant, diuretic and laxative. It is also used locally in the manufacture of varnish.

The old method of obtaining the resin consisted of boxing (cuts often extend halfway through the tree trunk) and refreshing by burning at frequent intervals to expose the cut. This method of tapping being practiced by Samar tappers is crude and often resulted in the entry of wood-destroying organisms, windfall and/or subsequent death of the trees.

Balau Tappers

Of the five balau tappers in Samar, only three are actively involved in trading business which is considered a family affair. Sources of apitong resins are about seven kilometers hike from the national highway of Bagacay, Hinabangan, Samar. There is only one known "kapatás" and at the same time buyer/trader of balau resin in the area.

Collection of balau resin does not follow any schedule neither with peak season for reason that DENR does not grant permits to gather the resin. A gatherer generates income of ₱ 120.00 per container (one kerosone can which is equivalent to four liters) from sale of balau resin. A person could tap ten trees/day. One tapped apitong tree produced one liter of tapped resin, hence, a production of ten liters per collection. Collected resins are brought down from the forest to the highway in Paranas and to pick up site by foot and carabao skidding by tappers themselves. Balau resins are transported by motorized banca from Samar to Iloilo and neighboring island fishing villages, i.e., the fishing town of Estancia, Isla Higante and Sicogon all in Iloilo and nearby island of Masbate, all known for boat/banca making. Balau resins in the area are solely utilized for caulking purposes of newly assembled fishing boats.

The frequency of shipping is every two months with an average of eighteen containers per transport.

Balau resins are sold at ₱ 230.00 per container to these banca makers and ₱ 300.00 per container in the market. Transportation expenses are estimated at ₱ 700.00 per shipping.

Resin traders received a net income of ₱ 1,200.00 per shipping after deducting the initial financial capital, transportation and other miscellaneous expenses involved in the course of handling and transporting them from collection sites to the market.

However, there are times that balau resin gatherers are held by proper authorities like DENR in the course of transporting resins from tapping sites to pick up sites commonly along the highways. In this case, all collected resins are confiscated and stock at the nearest DENR office until the case is solved. Resins, which were not attended to by the owners/gatherers, shall be considered abandon and would be subject for open bidding to anybody interested.

Rattan Collection and Trade

At least ten species of rattan were noted within the SJTC areas. Palasan and limuran, which have a very high demand among furniture makers but observed to be already nearly depleted. But still, species collected include tumalim, kalapi and olisi . To date, there is only one rattan licensee who is actively involved in trading

rattans with direct supervision of the Community Environment and Natural Resources Office (CENRO) – DENR in Catbalogan, Samar. The permittee Ms. Virginia Gabon has an approved Annual Sustainable Yield Capacity (ASYC) of 252,703 lineal meters. However, for calendar year 1998, she had only manifested/production of 88,429.42 lineal meters with equivalent amount of ₱ 49,012.70 collected as forest charges.

Rattan poles are collected in San Juan de Buan areas. They are gathered by group of cutters under the supervision of a “kapatás” and carried out once a month. Collected rattan poles are transported from the cutting site to the arranged collection points by foot. With enough volume gathered in a designated collection area, the poles are loaded in the truck and brought to the stockyard of the licensee. They are finally delivered to furniture and handicraft producers in Cebu and Manila traders.

Among the obligations paid by licensee are the forest charges for the annual allowable cut (AAC) and reforestation trust fund which is pegged at ₱ 0.20 for rattan poles with diameters of \leq two cm and ₱ 0.50 for poles with diameters of \geq two cm. For palasan however, the forest charges is ₱ 0.50 for a \leq two cm size, and ₱ 0.85 for \geq two cm sizes of poles.

Below are the estimated expenses incurred in the course of marketing rattan poles, viz.:

hauling (ten wheeler truck)	-	₱ 20,000.00 to 25,000.00
freight	-	₱ 1.00/pole
arastre	-	₱ 0.20 to P 0.25/pole
coast guard and other check points	-	₱ 5,000.00 per delivery

In addition, prices of rattan poles transported from Samar to Cebu are as follows:

SPECIES	SIZE/DIAMETER (CM)	GATHERERS (₱)	TRADERS (₱)
Palasan	2.25	8.50	14.00
Tumalim	3.25	26.7	45.00
Kalapi	2.50	10.5	17.00
Olisi	2.75	16.0	28.00
	1.65	3.0	11.00

Rattan permittee operating at the former concession area of SJTC concentrates more on trading rattan poles in Cebu which offers a thriving rattan craft industry both for local and export market purposes.

Other NWFP Resources Observed at SJTC Areas

There are about eight species of erect palms found in the areas. Anibong, a gregarious palm which has a tendency to clump is the most predominant. However, anahaw, whose leaves are gathered by local residents and sold as a substitute roofing material is the most commercially important erect palm species.

The bamboo family is represented by a single species, malabagacay, which is found along stream banks. Only a few bamboo clumps were observed in the area.

Wild abaca abounds in lower elevations, colonizing the patches of open areas along creeks. Some families gather abaca stalks, process them into fibers and sell the fibers at ₱ 7.00 per kg.

Bariw, a member of the Pandan family, whose leaves are made into bags, mats and other handicrafts is observed to be evenly distributed in the areas surveyed.

Balinguway, which is used as a substitute for rattan as a tying material, grows abundantly in areas left open by logging.

The area is also rich in other species that are economically important, such as useful vines, edible roots, medical plants, orchids/epiphytes and different fauna species.

Problems Encountered by Forest Settlers/Farmers Dealing on Selected NWFP

- 1) Insufficient transport system and poor roads to transport collected NWFP especially rattan palm and almaciga resins
- 2) Unawareness of scientific and proper techniques of tapping almaciga and apitong resins to sustain yield of resins and not endangering the health of trees
- 3) Insufficient knowledge in preservative treatment of rattan to minimize occurrence of stains and insect attack and water damage to minimize unwanted rejects and demerits in pricing
- 4) Low level of knowledge in processing and maximum utilization of other NWFP
- 5) Broaden spectrum by DENR and other concerned government agencies with regard to tapping of apitong and other related species for resin yield.

C. Surigao Development Corporation (SUDECOR)

Identified project sites found within the concession of SUDECOR include the barangays of Pakwan in the municipality of Lanuza, Surigao del

Sur; Sitio Gacub of Barangay Inapuyan, Carmen, Surigao del Sur; and Sitio Tabon-tabon and Barangay Suba in Tago, Surigao del Sur. These are former-logging areas of SUDECOR which accounted for a small portion of the total areas at 75,120 hectares (45,551 ha. operable forest and 21,503 ha inoperable forest). Pakwan and Gacub are logged-over areas that have been converted into resettlement areas. Suba and Tabon-tabon are located in the present logging campsite of the concession hence, some of the people temporarily settle along the vicinities of the logging camp.

Observations and interviews show that these forest settlers are predominantly inhabited by local tribes known as Manobos (90%) while the rest are Cebuanos and Warays. Pakwan consists of about 250 households with 2,000 populations, some of which are former workers of the company. Gacub on the other hand has been logged in 1970's and was open for occupancy in 1980's and now with 2,000 inhabitants. Suba and Tabon-tabon have about 50 households who prefer to stay in the area until the logging operation exists. Pakwan and Gacub are approximately twenty and twenty-five km away; while Suba and Tabon-tabon are about thirty-five and fifty km away from SUDECOR's Administration/Wood offices. They are accessible through an all-weather road.

Considering the thick forest areas around, forest settlers are engrossed to be engaged in fuelwood/industrial tree plantations tree farming, i.e. *Gmelina arborea* plantation's in the logged over areas with fire breaks using fruit trees for fire control, poles and piles collection and lumber processing of available lesser-known species. Others resorted in the collection of NWFP such as rattan, anibong palms (bahi) abaca stalks, anahaw leaves, buri, pandan, vines, orchids and game animals. A handful of forest settlers mentioned that as much as possible they try to avoid cutting of trees to preserve the aesthetic value of the forest and at the same time to preserve the place as sanctuary of wildlife.

Collection of NWFP in SUDECOR

The project sites mentioned above are considered critical as far as peace and order condition is concerned. Most of the time the place are infiltrated with insurgents who are Manobo rebels fighting against the company's evacuation from the area in consonance with government's approval of CADT in favor of the IPs. Nevertheless, SUDECOR was very supportive by providing full assistance to the ITTO-FPRDI crew with military escorts in the course of conducting survey and interview of forest settlers in the project sites. Most of the settlers especially those from Suba and Tabon-tabon live in the interior hinterlands near the logging campsites. In this regard, they could hardly be reached by any form of vehicle neither roads are always close and impassable. For this reason transport of collected NWFP poses a big problem for these people. Collection of rattan is considered the major NWFP being exploited in the four sites surveyed and visited.

Rattan

Manobo rattan gatherers collect rattan poles by camping in the forest for a period of one week. Usually, they are given advance payment either in cash or in goods i.e., rice, sardines, cigarette, noodles, "drinks", etc. by a concessionaire or depending on their preference. But most of the time these rattan gatherers directly transport their collected rattans to their identified buyers in the nearby towns. For those working under a concessionaire, cash advances are deducted from the payment of products collected. Independent gatherers which are mostly group of four to five people transport their collected rattans weekly or every Friday by foot from the forest to pick-up sites, i.e., Pakwan, Gacub or Suba. These are lump until such time that the volume gathered is already enough to finally transport them to Barangay Antao, the central pick-up site located along the national highway which is about four km from SUDECOR's office. Normally, all collected NWF are transported from collection sites to the central pick-up site using company's dump truck free of charge. From Antao, they are transported to buyers/traders either in Tandag, Tago or Cantilan, Surigao del Sur for possible treatment prior to its delivery to final buyers or traders in Cebu. Buyers in Surigao del Sur shouldered the transportation expenses at ₱ 3.00/pole regardless of species.

Rattan traders always set the buying price of poles depending on the size or diameter and species, viz:

Species	Size/diameter, 8 m long (inches)	Selling Price ₱/pole
Palasan	1 ¼	20.00/pole
	1 1/8	12.00/pole
	1	10.00/pole
	7/8	6.00/pole
Kalapi	1 ¼	26.00/pole
	1 1/8	18.00/pole
	1	10.00/pole
	7/8	8.00/pole
Tumalim	5/8	5.00/pole
	¾	6.00/pole

For split rattan the selling price was set at ₱ 15.00/100 pieces.
(Palasan, kalapi, and tumalim species), one bundle is equivalent to 100 pieces.

Most of the time the high quality rattans, i.e., free from stain, insect attacks, etc. are shipped to Cebu while rejects are sold to local producers in Surigao del Sur.

A Monobo rattan gatherer has an average collection of 100 pieces of rattan per week which is equivalent to ₱ 300.00 per week or ₱ 1,200.00 per month net income.

Some are patient enough to process their collected rattans into basketries, hammock and other novelties adorned with Manobos intrinsic designs. However, this activity is not regularly done as it all depends on orders from lowlanders. Weaving of handicrafts like basketries and hammock are family affair among the Manobos. The Manobo hammock is very popular because of its unique and intrinsic designs. A family of four could finish three sets of rattan hammock per week regardless of sizes. Prices of finished hammock products are: ₱ 100.00/set for small size, ₱ 200.00/set for medium size, and ₱ 300.00/set for big size. Again these are all transported from Suba or Tabon-Tabon to Antao, the main pick-up site using the company's dump truck. On the other hand, the family could generate additional income of ₱ 500.00 a week from basketries and mat weaving using buri leaves, also on order basis.

Other NWFP's collected by these forest settlers include balau resin from apitong and damar resins from yakal species solely for domestic purposes, i.e. for kindling fire and also as incense to Manobos ritual and religious ceremonies. Kalingag leaves and barks are also extracted for medicinal and confectioneries purposes. Occasionally, wild honey or "dugos" among the Manobos, as well as game and live animals are also collected and sold at the following prices: ₱ 50.00 per bottle (lapad) for wild honey; ₱ 150.00 per head of adult talking parrot and ₱ 50.00 per head for "kulasisi" pet bird. Though, these activities are seasonal yet this augmented extra family income among Manobo IPs at ₱ 500.00 from sale of wild honey and ₱ 300.00 from sale of pet birds per season.

Further, 50% of the Manobos in Pakwan indigenous community are also actively engaged in industrial tree plantations, i.e., Yemane (*Gmelina arborea* R.Br.) and Moluccan sau [*Albizia falcataria* (L.) Fosb.] in the logged-over areas of the concession. The area has already been granted to these IPs following CADT's approval program of the government.

Farmers/forest settlers preferred to sell their poles to provincial traders following the straight buying system, specifically in Butuan City.

Below are the prices of harvested poles of *Gmelina* and *Albizia* by Manobo ITPS farmers in SUDECOR:

Size/Diameter (cm)	Selling Price (₱ /m ³)
30 – 39 cm	2,500.00
40 – 49 cm	2,900.00
50 – 59 cm	3,000.00
60 and above	3,100.00

Hauling and transportation cost from cutting site in Pakwan, SUDECOR to Butuan City is estimated at ₱ 18,000.00 for a ten wheeler;

₱ 1,000.00 for driver hiring fee; ₱ 700.00 for driver's helpers and about ₱ 1,000.00 for foods and toll fees at check points and other miscellaneous expenses in the course of transporting these products. About ten m³ can be accommodated in one truck/transport.

Problems Met by Forest Settlers at SUDECOR's Project Sites with Regard to NWFP and Other Forest Products, Collection and Handling

- 1) Insufficient knowledge by Manobo rattan gatherers in using preservative treatment of rattan to minimize stains and insect attack;
- 2) Lack of necessary promotion for Manobos woven products;
- 3) Lack of transport facilities and accessible/passable roads to transport forest products
- 4) Illegal logging – this practice was observed in some areas of SUDECOR especially in the vicinities of the project sites
- 5) Squatting and occupancy - cultural communities like the Manobos found within the logging concession were identified
- 6) Peace and Order Situation

The uncertain peace and order condition in the areas (project sites) hamper the effective execution of the company's activities and also of forest settler's daily routine to sustain their living.

- 7) Problem in Upland Products' Marketing

The inaccessibility of some areas/study sites to market routes poses great difficulty to the marketing of the forest occupants' produce.

D. NATRIPAL – Nagkakaisang Tribu ng Palawan or Indigenous People's Apostolate based in Palawan

NATRIPAL as cooperator of this project has three project sites, namely:

- 1) Sitio Kayasan found within Barangay Tagabinit, Puerto Princesa City. Located thirty-eight km from the city proper, the area may be reached by taking a two-to-three-hour heavy-duty jeepney ride from the city to barangay proper of Tagnipa, followed by an hour or two of hiking. It has an area of 4,000 hectares which is also the area applied for in the community's ancestral domain claim. The site is generally mountainous which is the home to thirty households of indigenous peoples, the Tagbanua and Batak.

- 2) Campung Ulay is a barangay of Rizal municipality in Southwest Palawan, some 207 km. from Puerto Princesa City. The South China Sea bounds the municipality's northern and western part. It has a total land area of 14,925 hectares or twelve per cent (12%) of Rizal's area. The place is generally characterized by low mountains with secondary and primary forests. As of today, Campung Ulay had a total of 240 households, 60% are Palau'an and about thirty-eight per cent (38%) are non-indigenous migrants. Others are either Cuyonon, Cagayanon and Tagbanua. Upper area of barangay is reported for their abundant supply of rattan and almaciga, while the lower areas are vast expanse of ricefields.

- 3) Punta Baja like Campung Ulay, is a barangay found in Rizal town about 207 kilometers southwest of Puerto Princesa City. It has a total land area of 12,118 hectares, of which 2,113 is arable. It has a total population of more than 4,000. Forty-seven per cent (47%) of these households are concentrated in the lower portion and coastal areas, while the 53% are scattered in the hilly part of the barangay. Sixty-five per cent (65%) of these households are either Palau'an, Malbag or Tagbanua while the remaining are migrants. Farming is the most important source of livelihood. Almaciga tapping, honey gathering and rattan collecting are other important sources of income.

NATRIPAL, an association of indigenous groups of Palawan was generous and cooperative to be the sources of data and other information for activities of the project, i.e., conduct of inventory of NWFP and interview of forest settlers engaged in the collection, trading and marketing of NWFP. The primary aim of NATRIPAL is to secure the freedom of indigenous people within their ancestral domains or native lands, and among other things, this involve the promotion of the sustainable use of natural resources on such land in order to improve the quality of life of indigenous people.

A collaboration with this association and members of the three indigenous communities (Kayasan, Campung Ulay and Punta Baja) had been carried out to establish information about the collection, trading and utilization of a range of NWFP found thereof, i.e., almaciga resin, rattan, honey, bamboo, etc.

NWFP's in NATRIPAL Project Sites

Almaciga Resins

The most important product for the three indigenous communities is almaciga resin or popularly known as Manila copal in the international trade market. It was for this reason that the land was granted to these IPs to operate under government's CADT programme.

Almaciga trees in the Philippines are protected and resin tapping is only

permitted under license. All collected resin has to be registered with the DENR and a fee of ₱ 1.00 per kg of resin is collected as forest charges prior to its sale or transport. In granting the land to the people of Punta Baja, the community was also granted the license to harvest almaciga.

Collection of Almaciga Resin

The almaciga trees are located a day's walk from the three indigenous communities. About 75% of the inhabitants are involved in collecting the resin over the four-month harvesting season from January to April.

Tappers has "kapatás" or lead man/leader. The "kapatás" makes cash advances from the leader of a federation/association, working under NATRIPAL. The cash advance is used to buy provisions i.e. rice, sardines, noodles, etc. for their stay in the forest. Part of these provisions ends up with the family the tapper-leaves behind. The value of the goods and cash advanced to the resin gatherers is deducted by the "kapatás" from the share of the gatherers on resins collected and delivered. A gatherer has income per month that ranges from ₱ 200.00 to ₱ 600.00 while the kapatás earns ₱ 500.00 to ₱ 3,000.00. Almaciga resin gatherers spend three days at a time in the forest gathering the almaciga.

Tapping is strenuous work. The trees are tapped on an approximately eight to nine week cycle with each collector responsible for about thirty to thirty-five trees. Some of the tappers make new cuts on the day the resin is collected. However, interviews show that majority of the tappers shorten the cycle of cutting by one week than the cycle of collecting the resins. The sacks of resin collected which weigh forty-five to fifty kg each are put in improvised rattan containers locally called "ararong." These are slung on tappers backs and transported on foot down inclined terrain to the warehouses in Punta Baja and Kayasan areas and from there on to NATRIPAL main office in Puerto Princesa City. Transport of collected resins becomes doubly difficult when the rains come. NATRIPAL pays the community ₱ 5.00 per kg of resin. It is then sold on to local processors of paints and varnishes and plastic at P 13.50/kg either in Manila or Cebu. Majority of the raw resin is sent abroad.

It has been observed that resin yield varies between locations. Tappers in Punta Baja and Campung Ulay in the municipality of Rizal collects an average of six kilograms per tree while tappers in Kayasan, Puerto Princesa City harvest an average of only four kilos per tree. The difference in yield is due to locational differences in soil condition and elevation which affect the general health of the tree. Added to this are the different tapping procedures these three groups of NATRIPAL tappers applied. This, in turn affects resin yield.

While tapping almaciga is a veritable economic activity, very traditional, unscientific and injurious methods of extracting the resin are still being practiced by indigenous people in the three project sites especially Tagbanuas. Among these old and traditional practices are: No restriction on diameters of trees to be tapped; initial cut of four inches wide (horizontal cut) with no definite thickness; rechipping of one inch thickness per cut; and maximum of eight tapping cut with no definite sizes for bigger trees and four tappings cut for smaller diameter trees. Though NATRIPAL imposes penalties for tappers who failed to follow the above-mentioned rules, yet

these are indeed very crude methods which are not always observed by NATRIPAL tappers and members of the association.

Conduct of Training Programs

With the goal of rectifying the wrong practices of tapping and harvesting almaciga exudates so as to avert possible loss of almaciga trees in Palawan, FPRDI-ITTO and DENR in collaboration with NATRIPAL decided to hold a seminar-training. A two-man crew was designated to fit the needs of the Palawan indigenous tappers. This training consisted of both classroom session and a practicum where correct tapping practices developed at FPRDI were discussed and demonstrated.

Participants came from the three project sites of NATRIPAL, i.e., Kayasan, Puerto Princesa City; and Campung Ulay and Punta Baja in Rizal. The participants represented the three main ethnic groups of the province; a) Ten Bataks from the northern central part and representing the Kayasan project area; b) Ten Tagbanuas from central Palawan; and c) Twelve Palau'ans from the southern part of the island. The Tagbanuas and the Palau'an represented the NATRIPAL projects sites in Campung Ulay and Punta Baja. Majority of the participants could neither read nor write, especially Bataks. They are almaciga tappers, rattan and honey gatherers.

The training program consisted of both classroom work i.e., lectures, field demonstration and hands-on-exercises.

The lectures which were conducted in an improvised lecture hall, were supplemented with handouts; illustrations and presentation of tapping tools and materials.

While Tagalog- English was employed as medium of instruction, lectures were translated into the dialect of the Bataks and Palau'an by NATRIPAL Staff.

The trainees posted a 100% attendance in all every meeting since this was a live-in seminar. This, plus their enthusiastic participation in the open fora indicate a high level of interest on the subject matter.

The participants were required to note the right tapping procedure in preparation for their practical examination. The practicum was done in the nearby foothills of Sitio Nagsabat.

During the practicum, participants were first requested to demonstrate their current method of tapping almaciga trees. After this, the scientific techniques in tapping developed at FPRDI were demonstrated in detail. The advantages and disadvantages of both techniques were explained. Each participant was required to demonstrate the correct tapping procedure he/she learned in the classroom. NATRIPAL Staff monitored the performance of thirty-two participants under the supervision of the trainers.

During breaks, participants were interviewed about their system of collecting, trading, processing and marketing non-wood forest products (NWFP) especially resins.

Certificate of completion were awarded to the participants. Generally, the seminar was a tremendous success. The trainees showed their enthusiasm and interest on the subject matter by participating actively in the discussions. They shared their problems in tapping, the most important of which are:

1. unfamiliarity with the legal framework surrounding almaciga utilization;
2. insufficient knowledge on correct and wrong practices of almaciga tapping;
3. trading and marketing of almaciga resin;
4. approval of forest sector policies that gave more rights and management responsibilities to forest based communities (CADTs and CBFMAs) including the management of its resources, e.g., almaciga resin concessions and
5. the perennial attack of pest and diseases especially termites on the standing almaciga trees.

Honey Gathering

Indigenous residents from three sites gain additional income from gathering and selling of wild honey. This activity is done from March to May, when many forest trees, i.e., nato [*Palaquium luzoniense* (F. Vill.) Vid.], ipil [*Intsia bijuga* (Colebr.)] and manggis [*Koompassia excelsa* (Becc.) Taub.] are abloom and bees abound. There are two types of bee in the Palawan forests but the better comes from the "pukyutan" bee (*Apis cinerea* and *A. mellifera*) whose nests can be seen high up in the towering manggis trees. To get a beehive that is ready for the picking as it were, a gatherer first smokes out the bees from the hive. This is best done in the evening when the bees are less active. With the assistance of rattan hoists, the trees are climbed and the nests lowered on pulleys. Up to four different nests may be found on one tree, each of which yields around four liters of honey. The gatherer then gets the comb and squeezes out the honey, filtering the extract through a cloth or a fine meshed plastic screen. Further refinement may be done by heating the honey to remove excess water through evaporation. Honey is then stored in a three gallon plastic containers. For IPs, gathering of wild honey is very profitable activity. Twenty liters of honey sells for around ₱ 250.00. One family revealed that for the past three years, they were able to harvest an average of thirty containers (five gallon each) for the whole season of honey gathering. This is equivalent to about ₱ 10,000.00 income for the whole honey gathering season.

Rattan Gathering

Rattan gathering is a major supplementary source of income for households in the project sites. Rattan collection appears relatively simple and straightforward, but is actually highly labor-intensive and time consuming. Once the plant sources have been identified (and finding them in the forest may take some time), the gatherers cut the stems and dislodge them from the plant itself and from the surrounding trees with

which the stems and climbing organs are intertwined. The stems are stripped of its leaf sheaths, where these are present, cut into the desired lengths, bundled and hauled by foot or carabao skidding to a base camp or stockyard like in this case at NATRIPAL buying stations. These are finally transported to Puerto Princesa City buying station or market for further handling and processing.

Gatherers from the indigenous groups are reported to follow appropriate norms for harvesting, e.g., cutting only mature canes (roughly, at least twenty meters in length), clearing the underbrush around rattan wildlings or transplanting suckers and wildlings in less dense areas. In contrast, many gatherers from outside the community are known for their wanton strip harvesting and cutting of immature plants.

Weather and economic market factors (e.g. demand for the product and availability of labor) weigh upon the decision on when to gather rattan. On the other hand, the volume of rattan gathered and the duration of the whole process depend upon various factors such as distance, number of workers and essentially the funds available to pay for food, wages, and related expenses. A single rattan plant may yield as many as thirty mature poles, although the current average in the area is about ten poles per palm tree.

The laborious process of rattan collection usually requires the cooperative efforts of at least three to five people. Palawan households usually provide the labor, while local traders mostly from among the migrants extend the funds for the operations. The local practice is for the local traders representative, the work supervisor or *kapatas*; to extend credit in cash and/or in kind to the gatherers. These advances are needed by the gatherers for the families they temporarily leave behind and for their own provisions during the harvesting. The amount varies and depends in part upon the personal relationships between the supervisor and the worker, although reports from the area indicate an average of ₱ 500.00 to ₱ 800.00 per contract. The amount is later deducted from the cash equivalent of the total harvest delivered by a gatherer. The bundles of rattan are transported from the forest either by foot or by carabao skidding to pre-arranged collection points and finally to stockyard of NATRIPAL local traders. Assorted rattan species with twelve ft. long are sold at ₱ 4.00/pole for $\frac{3}{4}$ inch diameter and ₱ 6.00/pole for $\frac{5}{8}$ inch diameter. Split rattan is sold for around ₱ 25.00 per 100 pieces. A rattan gatherer is paid half the selling price for his labor in collecting rattan where he gets an average income of ₱ 500.00 per month. The species found in the areas include *Calamus ornatus* Bl. Ex Schultes f. var. *philippinensis* Becc (*kalapi*), *Calamus merrillii* Becc., *Daemonorops mollis* (gatasan), *Calamus microsphaerion* (siksik), *Calamus marginatus* (labsikan) and *Calamus subinermis* H.A. Wendl. Ex. Becc (bugtong) . Harvesting of rattan in the country also requires a license.

Other NWFPC Collected at NATRIPAL Project Sites

Bamboo is used widely specially Buho [*Schizostachyum lumampao* (Blanco) Merr.]. These are collected from ancestral domain of the local people. Buho is commonly used as material for fencing but is now very popular for sawali making mats. Sawali mats are woven by the women of three IP communities particularly in Punta Baja. The standard size of a sawali is approximately 8 m x 2.5 m and sold at ₱ 300.00 per piece.

Anibong (*Caryota Cumingii* (Codd ex. Mart.) is another important NWFP in the three communities visited. These are used locally where the leaves of the palm provide roofing material and the very hard trunk is used for flooring, housing posts and for tool handles.

Tiger grass (*Thysanolaena maxima*) is commonly found in Punta Baja areas. For the past years, the grass was simply collected and sold in bundles in Puerto Princesa City for ₱ 5.00 per bundle. Lately however, an initiative by the EU-funded Palawan Tropical Forest Protection Program has enabled the community generate more income in the utilization of this grass. This was made possible by providing training programme to the IPs especially among women about making brooms from the tiger grass. The made-up brooms sell instead for ₱ 35.00 each thus significant value has been added to the raw material product.

Problems in Handling NWFP at NATRIPAL Project Sites:

- 1) Lack of transport facilities and roads to transport collected NWFP
- 2) Crude system of extracting almaciga resins
- 3) Ignorance in preservative treatment of rattan and bamboos
- 4) Fast depletion of bamboo and rattan in the three project sites, hence, its sustainability is a problem
- 5) Form of cleaning, high moisture content and too many impurities in wild honey

TRAINING, COLLECTION AND HANDLING OF SELECTED NWFP OUTSIDE PROJECT SITES

1. *Canarium* Resins (Manila elemi) in Bondoc Peninsula including Alabat Island, Quezon Province

At present there are five buyers/traders of *Canarium* resins operating in the entire Philippines, with concentration in Quezon Province.

Tapping of *Canarium* species (Pili group) for resin extraction provides livelihood for people of the Bondoc Peninsula and Alabat Island where they abound mostly in between coconut plantations and occasionally in the secondary forest. In the areas visited, many make out a living by tapping *Canarium* areas for resin yield; others are just part-time tappers waiting for the harvest of their farm crops. Some, whose farm lands are already depleted of soil nutrients became full-time tappers.

About twenty-five households were interviewed about their tapping resins operation. In as much, that all, of the *Canarium* trees are found in the backyard of these farmers, tapping *Canarium* trees is considered a family affair. Husband and wife including adult children are involved in collecting the resin over the nine-month harvesting season except from April, May and

June where tapping of resins is strictly prohibited. Each family owns and taps an average of fifteen trees found in their backyard. Tapping methods was observed to be crude and unscientific with three to seven tapping cuts done around the trunk regardless of diameter and age of trees. They deep-tap and over tap the trees. Collection of resin is done every fifteen days with everyday rechipping. An average of twenty-eight kg of resins is collected every fifteen days from fifteen trees. A family generates income of ₱ 1,770.00 per month from sale of collected *Canarium* resins.

Movement of resins collected by local tappers in the areas visited follows a simple flow scheme. Coconut farmers and full time tappers have usually their “kapatás” (foreman) who regularly deal, purchase and store collected resins in local warehouses until ready for transport to either Gumaca, Plaridel or Atimonan, Quezon. Others prefer to directly bring for sale their resins in neighboring bigger towns like Lucena City. Resin traders, on the other hand, store their purchased resin in warehouses where they are finally sold in Divisoria and Caloocan City, Metro-Manila at ₱ 40.00 to ₱ 45.00 per kg to Chinese traders.

The leading buyer/trader of *Canarium* resin in the country based in Gumaca, Quezon was able to be interviewed in the course of survey. He revealed that he normally exports eight tons of resin per month to Europe, specifically to France. Coconut farmers who are mostly part-time tappers, flock to his warehouse in Plaridel, Quezon to sell their weekly harvest of resin at ₱ 35.00/kg. Most of them come from the Bondoc Peninsula and Alabat island area. However, the trader emphasized that the resin business temporarily stops operation in April, May and June. At this time, *Canarium* resin production is not sufficient and the resin quality is quite inferior due to the shedding of the leaves of the trees.

Since *Canarium* resins are collected from privately owned land by farmers and permittees, harvesting them need not require any permit from the government. However, traders of these resins are required to pay a corresponding certification fee of fifty pesos (₱ 50.00) to DENR regardless of volume to transport the resin from collection site to final destination. To rectify the wrong practices of tapping and harvesting *Canarium* exudates so as to avert possible loss of *Canarium* trees in the areas covered, FPRDI-ITTO decided to hold a seminar-training on the proper techniques of tapping Manila elemi resins, among fifteen tappers and their “kapatás.”

2. Anahaw leaves

Farmers in Lopez and Calauag, Quezon are engaged in the collection and utilization of NWFP especially anahaw leaves. Farmers and some forest settlers revealed that anahaw leaves are utilized mainly for roofing purposes and also for weaving them into fancy fan and decorative decors mainly for export to Japan. At least twelve of the interviewed farmers in Canda Ibaba, Lopez located along the national highway to Bicol are full time anahaw and buri fan weavers. They found out that this backyard industry offers a more

lucrative source of income considering the abundant and free raw materials around.

Young shoots of anahaw leaves are collected from the nearby forest about seven km from the town proper of Lopez. The frequency of collection is once a week with 300 pieces of anahaw leaves per collection which is equivalent to 1,200 pieces a month. The collected leaves are transported from collection site to the weavers house either by foot or carabao skidding. Anahaw leaves gatherers are paid ₱ 0.30 per leaf collected. Weavers of anahaw leaves, could normally finished 2,000 pieces of export quality fan per month and sold at ₱ 1.10 a piece. The principal weaver normally hire the services of colleagues who do the framing of fan using thin slats of bamban and at the same time fixes the fan handles using bamboo slats. They do this during free time in their respective houses and paid ₱ 3.50 per 100 pieces of assembled fan. Finished products are bought and picked up by traders at ₱ 1.10 a piece and transported to Manila for domestic and export market. Though the system of trading is on order basis only, a family of anahaw fan weavers received a net income of ₱ 2,000.00 a month during peak season.

2. The Dumagats as Almaciga Resin Tappers

Training of Dumagats on Proper Tapping Techniques of Almaciga was held as per coordinated by the Infanta Integrated Community Development Assistance, Inc., (ICDAI), in Infanta, Quezon. This was made possible with the support from the Upland Marketing Program (UMP) of the Upland NGO Assistance Committee (UNAC).

Considering the abundance of almaciga trees in the mountain ranges of Sierra Madre where most of these Dumagats and other IP's like Ilongots dwell, ICDAI decided to hold a seminar-training on almaciga tapping.

There were fifteen participants who officially attended the 3-day live-in seminar/training. These were all Dumagats who came from remote areas of Gen. Nakar, Real and Infanta, Quezon. It was found out that 75% of the participants are illiterate. Lecture series were conducted in a layman language to adopt participants level. In this regard, lectures were translated into the local dialect of Dumagats by an educated peer. It was found out that 85% of the participants were neophytes or inexperienced in almaciga tapping, hence, quite easy for them to adopt the scientific techniques on tapping almaciga which were given in the lectures and likewise demonstrated in the course of the training-seminar. Nevertheless, a handful of the participants expressed their views on their system of tapping and handling almaciga resins during their active years in activity. Apparently, ICDAI wanted to assist the Dumagats reactivate in resin tapping, hence, requested for the training. The sole almaciga resin licensee in the area ceased operating two years ago due to poor marketing of the resin. Tappers who are mostly Dumagats stay in remote area in a village called "Lagmak" which could only be reach by hike about four days from Infanta and cruise four big rivers. In this regard transport of collected resins and other NWFP to either Infanta or Real towns is indeed a big problem. FPRDI researchers further discussed that resins from Infanta and adjacent areas

are of inferior quality due to many insoluble materials present. However, they further disclosed that the resins could still be processed into varnishes and paints following the proper handling and cleaning techniques.

3. The Indigenous People of Bukidnon and their Utilization of Potentially Important NWFP

Fr. Vincent Cullen Tulugan Learning Development Center (FVCTLDC) is an NGO that assist two Higaonon communities i.e., Mintapod and Kiudto in the province of Bukidnon. They work on various livelihoods like handicrafts from NWFP and the famous abaca fiber-based hinabol and kamuyot.

The Higaonon by tradition, live in unity with their environment. They are also very dependent on it. They farm and hunt for their livelihood and survival. They cultivate their own piece of land acquired with the permission of their Datu. They conduct rituals to ensure fertility, productivity and protection of their farms.

Higaonon is only one of the "lumad" (indigenous) groups of Mindanao. Aside from farming, production of hinabol; the woven abaca cloth and kamuyot, a backpack made also of abaca fiber is the main source of living among these indigenous people.

Barter and Trade

To acquire necessities available only in the lowlands, such as kerosene, school supplies and additional food, the Higaonons barter their agricultural products. Handicrafts such as baskets, mats, the abaca fiber-based hinabol and kamuyot also add to their produce. The hinabol and kamuyot have traditionally been produced by Higaonon women as gifts on special occasions, but is lately used for barter.

The project FVCTLDC currently implements focuses on the making of these abaca products because they believe that these activities do not only augment the income of the community members but also contribute to the continuation of their traditional practices.

The hinabol comes in various colors, designs, and sizes. It usually ranges from one-half to two feet wide and one and one half meters in length. In the older times, the fabric was originally used as chief material for the lumads. The kamuyot, in turn, is the common bag among the Higaonon.

Hinabol Production

Higaonon harvest abaca fibers during full moon because they believe that fibers at this time are of a better quality, i.e., fibers are longer, thickness and more durable. The Datu and the elders ensure that this harvest schedule is followed.

The old folks of Mintapod, the area which was visited used natural dyes because they found that these dyes last longer. At present, the weavers have started to use commercially processed dyes. Even though these easily fade when wet, these are readily available and would not require the time and effort necessary to produce natural dyes. The making of natural dyes is tedious and requires natural additives like lime, which had to be processed first before mixing with the dyes.

Production Process

The process of processing the hinabol after the abaca harvest is simple and light and is easily managed and implemented by women. The number of looms determines the production capacity of the enterprise. Each loom can produce around eight meters of hinabol a day. The processes of producing these abaca products are as follows:

- 1) hag-ut - this is the process of freeing the abaca fibers from dirt and other unnecessary plant substances usually done by men
- 2) lubok - the process of pounding or crushing fibers to soften them
- 3) sorting - fibers are segregated based on thickness and length
- 4) pangayukay- strands of fibers of the same length and thickness are tied together from one end to the other.

Women do the last three steps.

Dyeing the Fibers

Women are in charge of this task. They soak the tied fibers into commercial dye solutions. These are then hung to dry.

Weaving Stage

The women are the only ones doing the weaving. The weaving process is filled with rituals. Prior to the actual weaving, the women make some offerings to have a quality output, to ensure a functioning weaving machine and to avoid accidents. The only one who leads the rituals is the datu. No other man is allowed to watch the weaving process or cater the weaving area during the hinabol production.

Work Schedule

Hinabol production is not done everyday. The women agreed to work on the hinabol only during Saturdays as they prioritize duties at home. They only increase their production when there are orders.

The Higaonon do not have a problem in the supply and availability of abaca. At present, the abaca growing within their area is harvested two to three times a year but only during full moon. All families in the community continuously plant abaca.

Accessibility to the abaca plantation has not been a major problem to the elders even though the distance traveled by foot is around five kilometers from their weaving area and residence.

Financial System

The two communities of Mintapod and Kiudto do not have a formal financial management system, but practice a very simple one. The women produce then the staff goes to Malaybalay to sell the products bring the money back to the community and distribute it among the producers. Their prices are not necessarily cost income determined. The major item which determines the cost of the finished product is the labor vis-à-vis the time spent in preparing the fibers and weaving the hinabol. Other expenses include the commercial dye and, at times, the payment for the lanot from the men.

From September 1996 to February 1998, the two communities being handled by FVCTLDC reported a total income of approximately ₱ 20,700.00 from the sales of hinabol, kamuyot and small by-products or an average of ₱ 1,300.00/month.

Marketing

The hinabol caters to ethnic enthusiasts in Mindanao and other parts of the country like Manila. However, it gets only a minimal market share, in relation to the other abaca-based woven products, such as the tinalak of the Tiboli tribe in South Cotabato.

As regards the hinabol, direct marketing is being handled by FVCTLDC. Buyers of this item include friends of FVCTLDC staff, local traders in Bukidnon, and UNAC/PBSP in Manila. Advertisement is done through personal connections.

However, if the group decides to expand its operations, the marketing of the product needs to be carefully considered. The hinabol can be promoted as a raw material for popular item like fashion accessories, office and home furniture or ornaments. The kamuyot may be sold to groups such as NGO's, academe, and other sectors who favor ethnic products.

Impact of Production

The production of the kamuyot and hinabol is not regarded by the women as a major income source because these items have traditionally been used for barter. The share each women gets from the proceeds does not seem to contribute to the improvement of the Higaonon quality of life.

Economic Contribution

Income derived from this activity is used to augment their funds for acquiring school supplies for their children, food ingredients such as salt, sugar, and others and

fuel for their lamps. If they expand their production there would be minimal effects because the product caters to a select group and that material itself is a seasonal one.

Environmental Considerations

Abaca is a renewable resource. Waste materials from the harvesting to the production process such as extra fibers and liquid waste containing the dyes are managed manually. The work place is easily kept and organic wastes are properly handled. The accompanying beliefs and rituals surrounding the production make their activity very environment-friendly.

Lagonglong Tribes as Hinabol Weavers

Observations show that Hinabol weavers in Lagonglong, Misamis Oriental are quite artistic compared to the Higaonons. They accentuated their hinabol weaved products such as basketries, bags, ornaments and other decors with midribs of local species such as romblon, buri and tan-ag to appear more natural and appealing. These unique combinations command higher price to foreign markets.

4. The Sumilao Tribes as Broom Makers in San Vicente, Bukidnon

As part-time job, the Sumilao tribes who are mostly farmers generate extra income out of making brooms from tiger grass. Inhabitants numbering about thirty-five could produce 65 pieces of brooms at ₱ 30.00/pc. per day. One hundred pieces of stalks of tiger grass could be fabricated into two to three brooms. The made up brooms which accounted to 65% are sold in Malaybalay and Valencia towns on order basis. Others are display for sale along the National Highways. Broom making is a family affair with head of the family especially the father and other adult member do the collection of raw materials while the women and children do the actual broom making. The interviews revealed that a family has an average income of ₱ 1,200.00 per month from sale of brooms.

The Sumilao tribes do not have a problem in the supply and availability of tiger grass. Considering the abundant supply of the material, the people are not yet conscious about the sustainability of tiger grass. People collect the materials regardless of time or whenever order comes from traders/buyers in Malaybalay and neighboring towns. But few have already engaged in planting tiger grass in their backyard farms for convenience. Accessibility to the rolling topography of the naturally grown tiger grass is a big problem among gatherers especially elders, women and children.

Collection and Handling of Selected NWFP in the Islands of Burias, Ticao and Masbate

Masbate was considered special area for this project owing to unique NWFP found in the area. Foremost of these are *Canarium* resin or locally known as "salung," salago (*Wikstroemia spp.*) barks, bamboo, anahaw leaves and white vine (*Freycinitia spp.*). In this regard survey and interview was not only confined in the mainland of Masbate but also in the neighboring islands of Burias and Ticao.

The entire Ticao Island offers about 400 *Canarium* resin tappers. The farmers consider this activity as part time only or during off harvest season of palay. Farmers in San Jacinto tapped *Canarium* trees everyday following unscientific and very crude methods, i.e. deep tapping and overtapping. The trees are found in the secondary forest and in between coconut plantations. It would take at least three days to fill a coconut shell cup of *Canarium* resin. Some farmers sold the resins directly to buyers who pick up their harvest at ₱ 8.00 per cup of coconut shell. On the other hand, traders sold them at ₱ 12.00/coconut shell cup in the public market. In Cebu traders buy the resin at ₱ 20.00/coconut shell cup. But most of the farmers prefer to sell their collected resins in the local market for convenience reason. They do not want to burden the labor and expenses and other inconveniences they would entail in the course of transporting resins from Masbate to Cebu City. A farmer earns a modest ₱ 160.00 per month from sale of the resins. Salung resins are intended for domestic use only, i.e., for kindling fire and caulking boats for banca industry where Masbateños are known expert in banca/boat making in the country.

Canarium resins are also collected in Burias Island especially in San Pascual area. The pricing is just the same with that in Ticao Island though traders are more varied with buyers coming from Camarines Sur due to geographical situation of the island.

Other important NWFP found in the three islands, are:

- * Anahaw leaves - they are sold in the local market at ₱ 1.25/leaf or ₱ 125.00/bundle (100 pcs. per bundle) for roofing purposes.
- * Bamboos - for housing and handicraft making and all the species, i.e., bayog, kawayan tinik, buho and kiling are sold at ₱ 150/pole. Bamboo plantations are also found in the town of Milagros with the biggest area planted of seventy ha.
- * White vines or locally known as "sig-id" (*Freycinitia spp.*) are found abundantly growing in Barangay Cabigan, Pio V. Corpus, mainland Masbate. A handicraft entrepreneur revealed that he consumed an average of 100 pieces of white vine a month which he bought from the farmers at ₱ 50.00 per 100 pieces. Product lines from white vines include food cover, hamper, plant and flower holder, wall décor, placemats and market baskets. Further, the entrepreneur disclosed that he got an aggregate domestic sale of ₱ 24,000 for the year 1999.
- * Wild salago barks are naturally growing in the towns of Cataingan, Balud and Masbate. There is one Chinese businessman who engages in trading/buying salago barks from the forest settlers and farmers at ₱ 14.00/kg. The frequency of barks extraction is every three months to allow barks regenerate for the next harvest. A total of 2,000 kg of barks production from ten gatherers have been recorded. The collected barks amounted to ₱ 6,000.00 for every three months of barks extraction. Legaspi City is where raw salago bark is being shipped three times a year with seven to nine tons each.

Problems Encountered by Farmers/Forest Settlers Engaged in NWFP Collection

- 1) Marketing of collected forest products to bigger markets like Cebu City.
- 2) *Canarium* tappers and salago barks collectors still practice the crude way of extracting the resins and barks.
- 3) Workmanship of handicrafts especially vinecrafts need further improvement and design innovations.
- 4) Insufficient knowledge on preservation treatment of bamboos to avoid insect attack.

Conduct of Training Program and Acceptability of Technology

NWFP gatherers especially the indigenous people still practice the so called traditional way of extracting non-wood forest products, i.e., almaciga and *Canarium* resins, rattan, wild honey, erect palms, vines and barks of wild salago. Added to this are their beliefs and rituals practiced before extraction and utilization of such NWFP.

In this regard an appropriate technical skills and methods of harvesting them have been recommended and demonstrated to sustain productivity of NWFP available in the area.

Seminar-trainings on proper and scientific methods of resin extraction were therefore conducted among almaciga and *Canarium* resin tappers, "kapatás" licensees and interested inhabitants in Palawan, Samar, Infanta, Quezon, Alabat and Bondoc Peninsula. The seminar aims to avert the possible loss of almaciga and *Canarium* trees in the areas mentioned. Pamphlets and modules which cover the different topics served as guides for the participants in the course of the training program.

There was a positive response of the participants as showed by their active participation, enthusiasm and interest on the subject matter by participating actively in the discussions, adoption of the technology, appreciation of the tribal groups and the cooperators. The conduct of trainings was in time for the launching of a livelihood program of the government which aims to alleviate the economic-social status of IPs. Added to this is the proposed installation of almaciga resins/ purification/cleaning plant in Samar which require massive supply of resins thus, training on proper methods of harvesting resins by tappers is necessary.

By way of evaluating the seminars the following points are worth considering: 1) the topic on cleaning and grading of almaciga and *Canarium* resins should have been included; 2) more time should have been set aside for the practicum; 3) NATRIPAL and ICDAI should assign more assistants to translate lecturers into the dialects of participants, enhance interactions, tutorship and likewise, develop understanding and camaraderie.

After eight months, a follow up and monitoring activities of almaciga tapping by IP tappers was conducted and obtained the following data:

- 1) scientific tapping of almaciga was followed by tappers especially those found in the lowland areas, viz., 200 – 400 meters above sea level where almaciga stand are found like in Kadlasan areas in Punta Baja, Rizal, Palawan.
- 2) following the scientific methods of tapping especially on rechipping are hardly observed by tappers who do the rounds of tapping in high elevation areas (above 400 meters) i.e., Matulinong areas which could only be reached by walk for about eight hours from Kulpisan area in Punta Baja. For this reason, rechipping was done only once a month;
- 3) Increased number of regular tappers in Kulpisan, Punta Baja from fifteen to twenty-five, a clear indication that almaciga tapping generates employment;
- 4) Increased number of trees tapped from 115 to 160;
- 5) Increased income by tappers of about 35%, i.e., from ₱ 500.00 to ₱ 675.00 per month;
- 6) Tappers had minimized the injurious tapping practices thus making them aware of the importance of not damaging the cambium in the course of tapping;
- 7) Minimized tapping of undersized trees;
- 8) Increased number of almaciga resin buyers from one to three soon after the training course, a manifestation that more people get interested in tapping-resin activities; and
- 9) NATRIPAL officers, resin tappers and “kapatás,” had further disseminated the correct tapping procedures with their colleagues who failed to join the training course by conducting a -house-to-house campaign.

Tappers in Samar did not patronized much the proper techniques in almaciga tapping. This could be attributed to the lesser participation and awareness of the tappers, licensee, “kapatás” and DENR officials on the social, economic and environmental impact the training would contribute. Somehow, the training would serve as an “eye opener” for Waray-waray tappers to safeguard and avert the possible loss of abundant almaciga trees in the area.

Infanta resin tapping techniques and related activities by Dumagats was not observed and monitored for reason that their camp and tapping sites are situated in a very remote village called “Lagmak.” This Dumagat inhabited community could only be reached by walk from three to four days and cruise at least four big rivers along the mountain ranges of Sierra Madre. Likewise, roads leading to these areas are always impassable and rivers are oftentimes flooded. ICDAI officers revealed that almaciga tapping in the area died off instantly because of the very poor marketing and trading system of resins and also because of the poor quality of the resins with insoluble materials present, a deterrent factor in varnish and paint manufacture.

On the other hand, *Canarium* resin tappers in Alabat and Bondoc Peninsula areas are more adept to follow religiously the proper methods, i.e., not inflicting the

cambium in the course of tapping,, application of polyethylene sheets and correct rechipping. With these practices, farmers are vocal to say that aside from increasing resin yield, clean and quality resins are also produced.

Rattan gatherers from all walks of life both from the indigenous groups and outside follow corresponding norms in harvesting,e.g., cutting only mature canes (at least twenty meters in length). Others resorted for their wanton strip harvesting and cutting of immature plants.

The wild salago (*Wikstroemia spp.*) barks are collected in a very crude manner. Farmers in Masbate collect salago barks by stripping the barks, i.e., deep cutting and oversized cutting, that injure the plant. Deep cutting and oversized cutting can damage and kill the cambium and ray cells that ensure the proper transport of nutrients and water between the roots and the above-ground plant parts. Once these cells die, communication between the above-general plant parts cease leading to the death of the tree. Other farmers employ a more damaging method of bark extraction that is, they cut the whole plant to collect the barks. An appropriate method of salago bark extraction that will not endanger the health of the tree but sustain its bark yield is recommended for future adoption by farmers and gatherers of salago barks most especially in Masbate where they are abundant. The method is describe below:

Divide tree girth into two parts and strip one part. The unstripped bark served as the pathway for continuous supply of elaborated food materials between roots and leaves. This enables the tree to carry on its physiological functions and gave the bark a chance to regenerate.

Stripping shall be done during the rainy season, as the loosening effect of water made the bark easy to remove during this period. From twenty cm above the ground a one foot long strip of the bark shall be removed. Extra care shall be taken to minimize injury of the cambial layer while debarking.

Wild honeys are collected following beliefs and rituals offered by IPs. So far, there is no scientific method of collecting honey.

Erect palms like anahaw, buri and anibong trunks including anahaw leaves are cut and collected once they are mature and ready for processing into desired end-products.

Effect of Harvesting NWFP on the Socio-Economic Condition of Dependent Communities

The study indicated that harvesting of the so-called NWFP is favorably accepted and gaining strong support from the forest settlers especially the indigenous people. Emphasis on community participation has also focused attention on NWFP upon which many local communities are dependent.

Impact of extracting NWFP on the socio-economic and everyday living of forest settlers and farmers are indeed important findings of the study, viz:

- 1) Upliftment of socio-economic standard due to employment generations

The economic patterns in all the project sites studied are basically the same. Majority of the households depend on agriculture and forest related activities. Some households work their own wet-rice farms in the lowlands, majority tend to their kaingin in the uplands and seek extra employment on other farms whenever possible. With the rich forest resources around, majority further engage in the gathering and selling of NWFP, i.e., rattan, resin, honey, erect palms, woody vines, etc. The activity therefore generates employment and extra income among indigenous people. Other supplementary activities involving NWFP utilization which further generates employment include weaving of buri mats, fan from anahaw leaves, basketries, sawali or bamboo mats, hammock from rattan and vinecrafts. These activities somehow increased the number of direct and indirect jobs and local business opportunities.

2) Provide access to forest areas

Opening of forest in the course of construction of trails and establishment of temporary camping sites in the forest in the process of tapping and collecting almaciga resins, rattans, wild honey and woody vines is an advantage among forest settlers. This activity is an avenue for easy collection and transport of NWFP from collection sites to pick-up sites, hence, save time, effort and money.

Further, harvesting and processing of NWFP result to reduction of kaingin making activities and illegal harvest of forest products due to employment opportunities among indigenous people.

3) Creation of people's organizations

As social impact, extraction of NWFP generates strong ties and camaraderie among resin tappers, rattan gatherers, resin and rattan licensees and permittees, bamboo growers, traders, entrepreneurs, government officials especially DENR, private sectors and NGO's thus develop the necessary connections and contacts that could uplift the system of handling, trading and marketing of NWFP. This further brought in the creation of community organizations for the three project sites in Palawan. These were organized jointly by the NATRIPAL itself and the concerned Indigenous Cultural Communities (ICC). These organizations are: Campong it Mapangarapan it Palawano (CAMPAL) in Bgy. Campung Ulay; Samahan ng mga Tribu sa Kayasan (SATRIKA) in Kayasan and Bayatao; and Pinagtibukan it mga Palaw'an (PINPAL) in Punta Baja. The same is true with the organization formed in Aurora among Dumagats, called the Samahan ng Katutubong Dumagat sa Aurora (SAKADA).

Primarily, these organizations were organized as a sort of cooperative where the NWFP of the ICC's can be brought in for collective selling. Whereas, before when these ICC's have yet to be organized they are virtually at the mercy of the middlemen, to a large extent this dispensation has changed. The ICC's after these NWFP have piled up in their respective Area Servicing Units (ASU) can now bargain for a higher price. In addition, the outflow of

NWFP is now controlled to maintain competitive market price, as opposed to those times where NWFP's production is unhampered, sometimes to a point where it spurs a NWFP glut in the market, thereby keeping the prices at a very low level.

Above all these, the people's organizations ensure that the resources are managed sustainably. They organize cooperative efforts to replenish what otherwise have been heavily exploited areas. The organizations also secure that the NWFP production level is within the limits of the annual allowable harvest enshrined on its ancestral domain management plans.

These organizations hold their meetings on a monthly basis and at least convene the entire community in a general assembly twice a year.

- 4) Collection and feeling of some timber species, i.e., nato, ipil and manggis by some forest settlers mostly for domestic uses offer negative impact to the local communities. These species serve as important host for bees-producing wild honey whose nests are always found in these towering forest tree species. Collection of the species would mean decreasing its population available as host for bees-producing wild honey. The activity would further result in the increase of distance of collection site for wild honey from the IP's respective dwelling areas, hence, the end resulting to possible excessive migration or transfer of living areas into a more productive site.

CONCLUSIONS AND RECOMMENDATION

Past and present methods of harvesting NWFP especially from indigenous groups did not vary much. Collection of rattan, vine and erect palms depends solely on the maturity of the species. Honey gathering, on the other hand, is seasonal and is done from March to May, when many forest trees are abloom and bees are around. Almaciga and *Canarium* resins gave best yield during dry season in terms of volume and cleanliness.

Faulty tapping resin practices were corrected by holding seminar-trainings. Proper methods of bark extractions for wild salago was developed and introduced.

There was a positive response of the participants in all the trainings and seminars conducted as gleaned from their active participation in the lectures and adoption of the technology.

Identified major problems of NWFP gatherers include marketing, illiteracy on the part of IPs and insurgency problems in some areas.

Initial moves to educate this IPs have been carried out by military men (PNP) in Aurora as part of extension activities by the Department of Interior and Local Government (DILG) officials. Teaching Dumagats about the basics in reading, writing and mathematics is indeed a significant activity both for the uniformed men and the IPs.

Members of indigenous groups (majority of whom live near the forest) tend to depend on trading NWFPs. They are diverse in terms of species which are abundantly distributed in far flung local communities. Some of the places are not easily accessible by any form of transportation or by foot. Distance plays a very important role toward efficient collection, trading and transport of NWFP. The condition thus affected the sale of collected NWFP and ultimately the income of the gatherers.

Adoption of the technology on proper harvesting of NWFP generates more employment, increased income of gatherers which could be attributed to higher production of NWFP. Moreover, the technologies educate and appreciate environment- awareness among IPs and others involved in NWFP extraction, thus, contribute to lessen environmental problems. Further, this minimizes the unscrupulous and crude system of extracting them, hence, helps in the forest conservation program of the government.

Like any other NWFP, extraction of agricultural crops or agro forestry crops, like abaca in Bukidnon have cultural and historical origins which need to be protected and promoted and this should be made known to the buyers. The Higaonons weavers of hinabol and kamuyot, the Dumagats in Aurora and Infanta, the Sumilao tribes and the three groups of Palawan IPs will continue to be proud of their culture and be motivated to sustain their production activities need to be maintained.

Adoption of technology on resin tapping and salago barks, the opening of rattan and bamboo plantations as enhanced by the government and private sectors, and the continuous agro-forestry farming, i.e., abaca and fuelwood/ITPS, ensures the sustainability of NWFP and related forestry/agricultural crops. Since the Certificate of Ancestral Domain Title (CADT) has already been obtained by this IPs, the ancestral domain management plan that will be formulated should consider maintaining areas supporting the growth of NWFP and agro forestry crops.

There is also a need to strengthen the local communities to prevent the encroachment of lowlanders and the entry of their business activities.

Further, based on the findings of this study, the following are therefore recommended:

- 1) Training

Training should be the optimum linkage to impart technical knowledge to forest settlers. Appropriate training such as environmental impact assessment, integrated community-based resource management to include protection and conservation of biodiversity especially endangered species present in the area should be undertaken.

The government should forge more linkages with other government agencies and non-government offices (NGO) so that training and formation activities on the importance and socio-economic

effects of harvesting NWFP which at the end pave the way for more employment opportunities in the project sites.

Intensive training campaign should be implemented to raise the level of literacy for the facilitation of information dissemination and technology transfer on NWFP collection and utilization. This could be effectively done through either local radio broadcasts, poster papers/billboards or local reading materials like "komiks."

- 2) To further address the needs of the tribal groups like the issue on tenurial rights. Indifferences between indigenous and non-indigenous groups like licensees and permittees should be given immediate action. In this case, peace and order in local communities shall be attain.
- 3) Construction of transport facilities, i.e., roads and bridges and possibly communication facilities to ease movement of collected NWFP from source to market.
- 4) Provide for more employment opportunities

Findings reveal that majority of the respondents engaged in farming. This can be expected considering that most of them were upland farmers. Further, employment generated are more agricultural-based in nature, such as labor opportunities in tending fuelwood farm and extraction of old stumps, tops and branches of premium species like in the case of the Manobos in SUDECOR and Dumagats in IDC, Aurora respectively. This employment is short-lived and therefore could not sustain the enduring problems of the forest settlers. In this regard, a small-scale cottage industry using NWFPs could be opened up wherein these local raw materials or resources are indeed plentiful, as well as human resources are just around the corner.

- 5) Marketing needs

It is necessary to get in touch with market outlets and NWFP buyers to help them in the marketing of their extracted forest products and other products they produce.

Market surveys should be initiated to determine which of these NWFP have a strong market potential.

It is likewise recommended that study the capacity of establishing forest occupants marketing cooperatives. This could be viewed as an organized vehicle for soliciting active and direct participation of the forest settlers in which majority are upland dwellers.

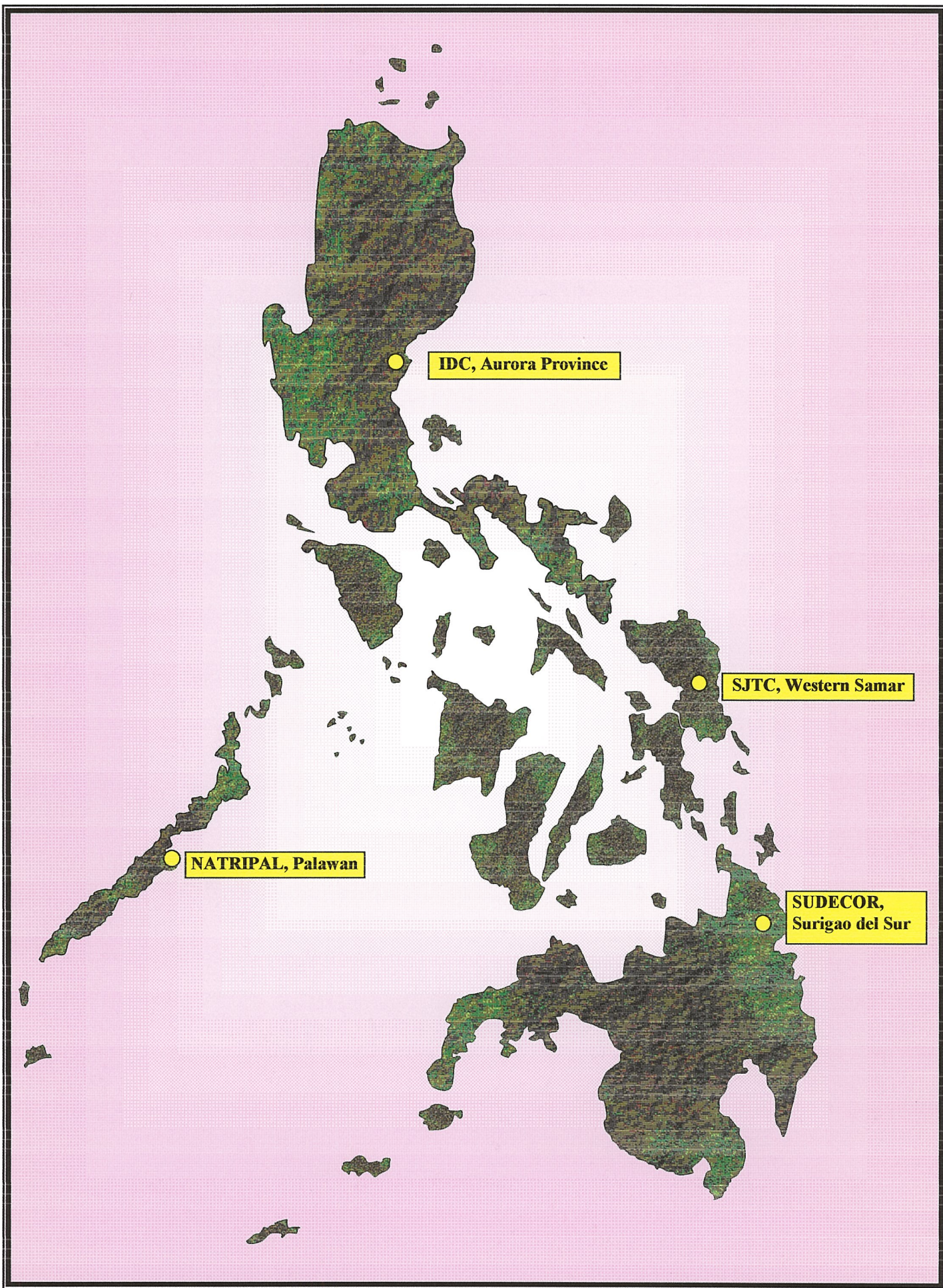
Table 1. Information gathered from the four project sites and selected areas where occupants are engaged in the collection of NWFP

Project Areas	NWFP and Others	Products	Prevailing Prices Per Unit Kilo or Volume	Volume Extracted Per Month (Ave.)	Ave. Income Derived/ Month (per family)	System of Trading	Means of Transport	Frequency of Collection
1. Industries Dev. Corporation (IDC)	Rattan (10 ft. long) assorted species, palasan, Limuran and gatasan		₱ 2.00/pole	1,250 poles	₱ 2,500.00	Contract basis	By foot from cutting site to pick-up site.	Weekly or as order comes
							By company's service truck to Dibacong IDC.	
							By weapon truck from IDC to either Baler, Aurora and Cabanatuan City.	
	Anahaw leaves		₱ 20.00/bundle (15 to 20 pcs./bundle)	200 pcs.	₱ 200.00		By foot	As order comes
		Anahaw fan	₱ 2.00 (summer time) ₱ 1.50 (rainy season)	1,300 pcs.	₱ 2,500.00	Contract basis	By jeep hiring	As order comes
	Bamboos (Bolo species)		₱ 8.00/pole outside IDC (12 ft. long) ₱ 5.00/pole for IDC	5,000 pcs. Every three months	₱ 3,500.00/ month a Dumagat farmer earns from bamboos	Contract basis	By carabao skidding or jeep hiring or IDC trucks	As order comes/ every three months for IDC
	Wild Honey		₱ 100.00/bottle (1 li)	5 gal. during peak season	₱ 2,000.00/ month	Contract basis	By making use of IDC trucks	Seasonal

Project Areas	NWFP and Others	Products	Prevailing Prices Per Unit Kilo or Volume	Volume Extracted Per Month (Ave.)	Ave. Income Derived/ Month (per family)	System of Trading	Means of Transport	Frequency of Collection
3. Surigao Development Corporation (SUDECOR) Surigao del Sur	Rattan (100 ft. long) Species Palasan		Size(in.) Selling Price 1 1/4 ₱ 20.00/pole 1 1/8 12.00/pole 1 10.00/pole 7/8 6.00/pole	400 poles	₱ 1,200.00	Contract basis	By foot from cutting site to pick up sites By company's dump truck from pickup sites to Antao (central pick up station)	As order comes
	Kalape		1 1/4 ₱ 26.00/pole 1 1/8 18.00/pole 1 10.00/pole 7/8 8.00/pole					
	Tumalim		5/8 ₱ 5.00/pole 3/4 6.00/pole					
	Split rattan		₱ 15.00/bundle* * bundle is equivalent to 100 pcs.					
	Rattan hammock		₱ 100.00/set (small size) 200.00/set (med. size) 300.00/set (large size)	12 sets	₱ 2,000.00		SUDECOR's trucks from local communities to Antao (main pick site)	As order comes
	Erect Palms Anibong (bahi)		₱ 2.00/pc. Size: 3 x 5 ft.	600 pcs.	₱ 1,300.00	Contract basis	By company's dump truck to Antao (central pickup site)	As order comes
	Fuel Wood		₱ 5.50/bundle	300 bundles	₱ 1,500.00	Contract basis	By jeep from Antao to Tandang, Madrid or Tago, SDS (markets)	As order comes
	Gmelina/Albizia poles		Size Selling Price (diameter cm) (m³) 30-39 ₱ 2,500.00 40-49 2,900.00 50-59 3,000.00 60 and above 3,100.00	50 m³ per harvest	₱ 120,000.00/ harvest		By 10-wheeler truck from SUDECOR to Butuan City at ₱ 18,000.00/trip	

Project Areas	NWFP and Others	Products	Prevailing Prices Per Unit Kilo or Volume	Volume Extracted Per Month (Ave.)	Ave. Income Derived/ Month (per family)	System of Trading	Means of Transport	Frequency of Collection
5. Quezon Province (Bondoc Peninsula, Alabat Island, Infanta and Gen. Nakar, ICDAI)	Canarium resins		₱ 35.00/kg from gatherers ₱ 45.00/kg as per sold by middlemen to local manufacturers or exporter	50 kg.	₱ 1,770.00	Contract basis	By foot or carabao skidding to pre-arranged collection sites By tricycle or jeep to either Gumaca or Lucena City	Every 15 days as per advised by kapatas or middlemen
	Almaciga resins		₱ 4.00/kg. from gatherer ₱ 8.00/kg. from middle man to the market	70 kg.	₱ 300.00	Contract basis	By foot and boat from tapping site to pick-up site to pick-up sites By weapon jeep to Infanta	Per advised by "kapatas" or middlemen
	Rattan (12 ft. long) Assorted species		Finger size ₱ 2.00/pole ₱ 0.05 coin size ₱ 3.00/ pole ₱ 0.25 coin size ₱ 4.00/ pole ₱ 0.50 coin size ₱ 8.00/ pole ₱ 1.00 coin size ₱ 12.00/ pole Palasan sp. (scraped) ₱ 28.00/pole	700 poles	₱ 5,000.00	Contract basis	By boat to pick up site By jeep to Gumaca, Lucena and Infanta	As order comes
	Bamboos (kauayan tinik)		₱ 25.00/pole	200 poles	₱ 4,000.00	Contract basis	By carabao skidding and jeep hiring to designated pick-up sites	As order comes
	Palm leave (Anahaw) Quezon Province		₱ 0.30/leaf (payment given to leaf gatherer) Anahaw leaf fan is sold at ₱ 1.10 a piece	1,200 2,000 pcs/	₱ 2,000.00	Contract basis	By foot, carabao skidding and boat to weavers house By jeep to market site as pick up by traders/middlemen	As order comes
	Vines (hingiw) Iukmoy		₱ 140.00/100 pcs. at 30 ft. long ₱ 85.00/100 pcs. at 30 ft. long for vinecraft	700 pcs. 800 pcs.	₱ 900.00 ₱ 700.00	Contract basis Contract basis	By foot, carabao skidding and boat By foot, carabao skidding and boat	As order comes As order comes

Project Areas	NWFP and Others	Products	Prevailing Prices Per Unit Kilo or Volume	Volume Extracted Per Month (Ave.)	Ave. Income Derived/ Month (per family)	System of Trading	Means of Transport	Frequency of Collection
6. Masbate including the islands of Burias and Ticao	Canarium resins		₱ 8.00/coco cup from gatherers ₱ 12.00/coco cup as sold by traders in the local market ₱ 20.00/coco cup for traders in Cebu	20 coco cups	₱ 160.00	Contract basis	By foot or carabao skidding and tricycle from tapping site to the market	As order comes
	Anahaw leaves		₱ 1.25/leaf or ₱ 125.00/bundle (100 pcs. per bundle)	10 bundles or 1000 pcs.	₱ 1,200.00	Contract basis	By carabao skidding and jeep to traders house/market	As order comes
	Bamboos		12 ft. long at ₱ 150.00/pole for housing and bamboocraft	100 poles	₱ 12,000.00	Contract basis	By carabao skidding and jeep to traders house/market	As order comes
	Salago barks		₱ 14.00/kg from gatherers ₱ 20.00/kg as sold by middlemen to traders	2,000 kg. from 10 gatherers	₱ 6,000.00 (every 3 months)	Contract basis	By jeep hiring to middlemen and by boat to traders in Legaspi City	As order comes
	White vines <i>Freycinia spp.</i>		₱ 50.00/100 pcs. at 30 ft. long	1,500 pcs.	₱ 700.00	Contract basis	By jeep hiring to traders	As order comes
7. Fr. Vincent Cullan Tulagan Learning Development Center (FVCTLDC) Bukidnon	Hinabol Kamayot products from abaca		₱ 30.00/m	25 m/mo (1.5 m.wide)	₱ 1,700.00/mo	Contract basis	By carabao skidding By motor bike	As order comes
8. Sumilao Tribes San Vicente, Bukidnon	Tiger grass for broom making		₱ 30.00/pc.	4,000 stalks	₱ 1,200.00/mo	Contract basis	By jeep hiring	As order comes



Location of Project areas of FPRDI – ITTO Project PD 15/96 Rev. 2(M.I.) in the Philippines



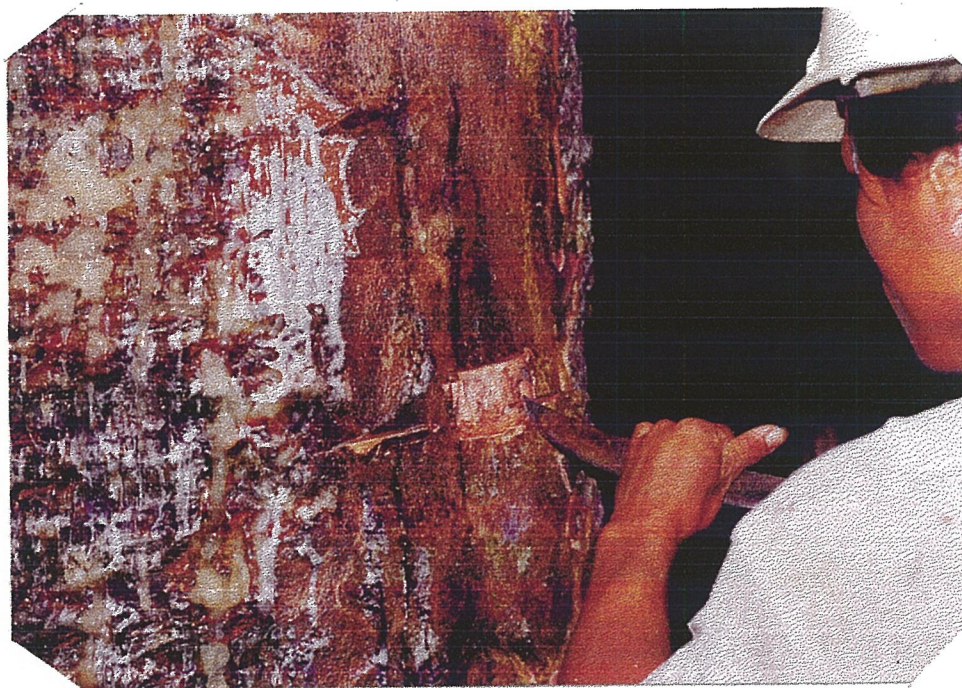
Forester A.B. Ella giving lectures on scientific tapping of almaciga.



A technical training on almaciga tapping was conducted for tappers of three almaciga licensees in Paranas and Hinabangan, Samar.



Participants ready to do the actual tapping during the field practicum.



A participant in Samar doing the scientific way of tapping almaciga during the field practicum.



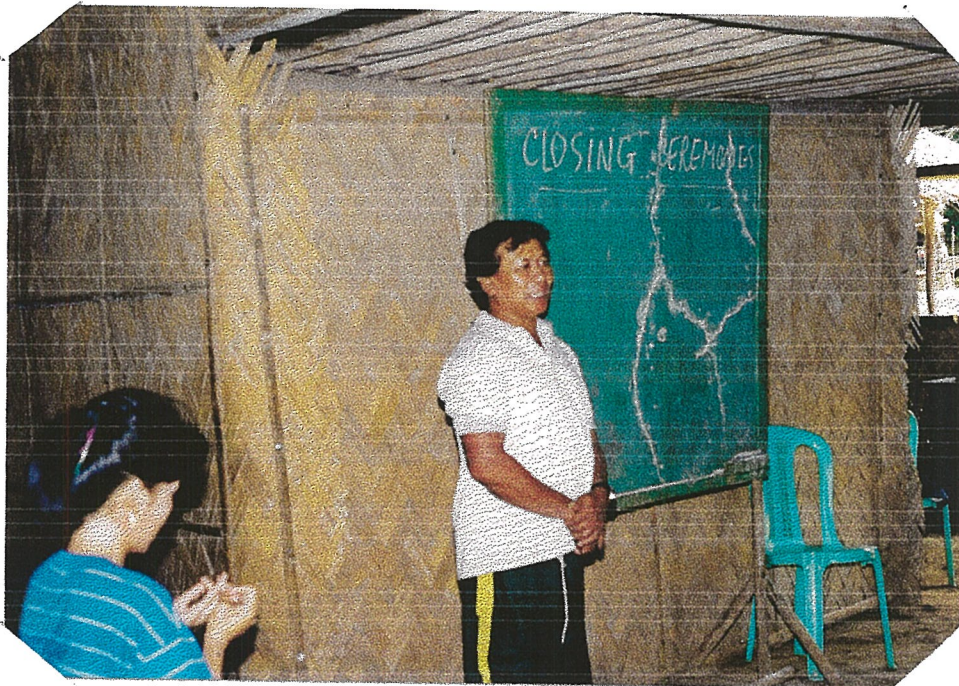
A “Batac” participant from Kayasan project site of NATRIPAL demonstrates the traditional method of tapping almaciga during the field practicum.



The training participants with the resource persons and NATRIPAL staff posed for a souvenir photo in front of social hall, Punta Baja, Rizal, Palawan.



(a)



(b)

A typical Dumagat (a) and Batak (b) reacts in one of the training sessions on almaciga tapping in Infanta, Quezon and Palawan respectively.



Sorting of almaciga resin



Almaciga resins piled in a warehouse of TIIC in Cabancalan Plant, Mandaue City. These were collected from Palawan and Samar provinces.



A technician patiently demonstrates the initial preparation of varnishes from almaciga resins.



Newly packed varnishes from almaciga resins processed by TIIP ready for distribution.



Out-of-school youth in Casiguran, Aurora (IDC area) patiently cleans rattan poles in preparation for its binding and stacking.



Rattan in bundles in a warehouse in Kulpisan, Punta Baja, Rizal, Palawan. Seven rattan species are harvested by Palaw-an'' in the forest and transported either by foot or by carabao skidding to pre-arranged collection points.



In the project sites of NATRIPAL, forest settlers are actively engage in sawali making using buho [*Schizostachyum lumampao* (Blanco) Merr.] which are abundantly growing in the area.



Assorted non-wood forest products, e.g., bamboo, sawali, rattan, nipa leaves for sale along the highways in Puerto Princesa City, Palawan.



Confiscated NWFP by DENR following violations of certain requirements in transporting them as observed in Samar.



Split rattan is commonly transported by foot by Manobo children from collection site to traders in Pakwan, an indigenous community found in the logged-over areas of SUDECOR, Surigao del Sur.



A typical village of Manobo tribe located in the logged over areas of SUDECOR.



SUDECOR is supportive and generous to provide military escorts and arms in the course of survey and interview of forest settlers found in Pakwan and Tabon-tabon areas.



Fuelwood from ITPS, i.e., *Gmelina arborea* is another source of income among Manobo settlers in SUDECOR.



An improvised heavy-duty motorbike commonly used by Manobo traders in transporting their collected forest products and agricultural crops from designated collection/pick up sites to the market.



Honey gathering in Palawan is considered as male dominated activity with the women participating only in the processing and marketing of the honey. Photo shows a “Tagbanua” climbs the towering Manggis tree [*Koompassia excelsa* (Becc.) Taub.] to locate hives. Manggis is the favorite host of honey bees.



An important NWFP in Punta Baja and Kampong Ulay communities is honey. Photo shows a collected pair of bee hives containing the honey ready for processing.



A tapped *Canarium* tree showing a day's harvest by tappers of resin following techniques gained in the training course.



An old woman in San Jacinto, Masbate tries to demonstrate the traditional system of tapping *Canarium* resin.



Collected *Canarium* resins contained in coconut shells for sale at San Fernando public market, San Fernando, Masbate.



Canarium resins piled in nylon sacks for transport to nearby warehouses. A medium-sized sack normally weighs 45-50 kg. of crude raw resins. These are commonly found in Alabat, Gumaca Quezon Province and some towns in Bondoc Peninsula areas.



Raw *Canarium* resins for export are repacked in polyethylene plastic bags before finally putting them in wooden crates of 21" x 10" x 14" (L x W x H) sizes. Plastic bags are used to prevent leakage or seepage of *Canarium* oil in the course of handling and transport.



Fresh collected and dried anahaw leaves awaits for further processing and transport from Ticao Island to Masbate.



A farmer in Lopez, Quezon inspects young anahaw leaves being dried in preparation for weaving into fancy fans and other miniature products.



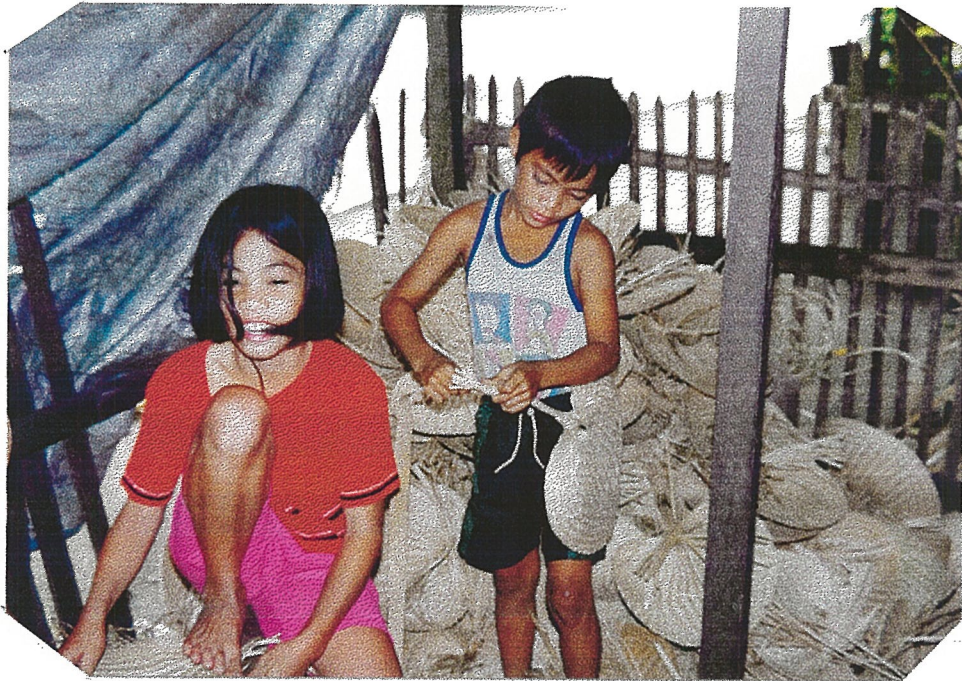
Mr. I. M. Javier inspects strips of dried anahaw leaves ready for fan weaving. Fan weaving is considered a lucrative source of living among farmers in Bondoc Peninsula area.



A freshly gathered anahaw leaves being air dried along the highways in Calauag and Lopez, Quezon.



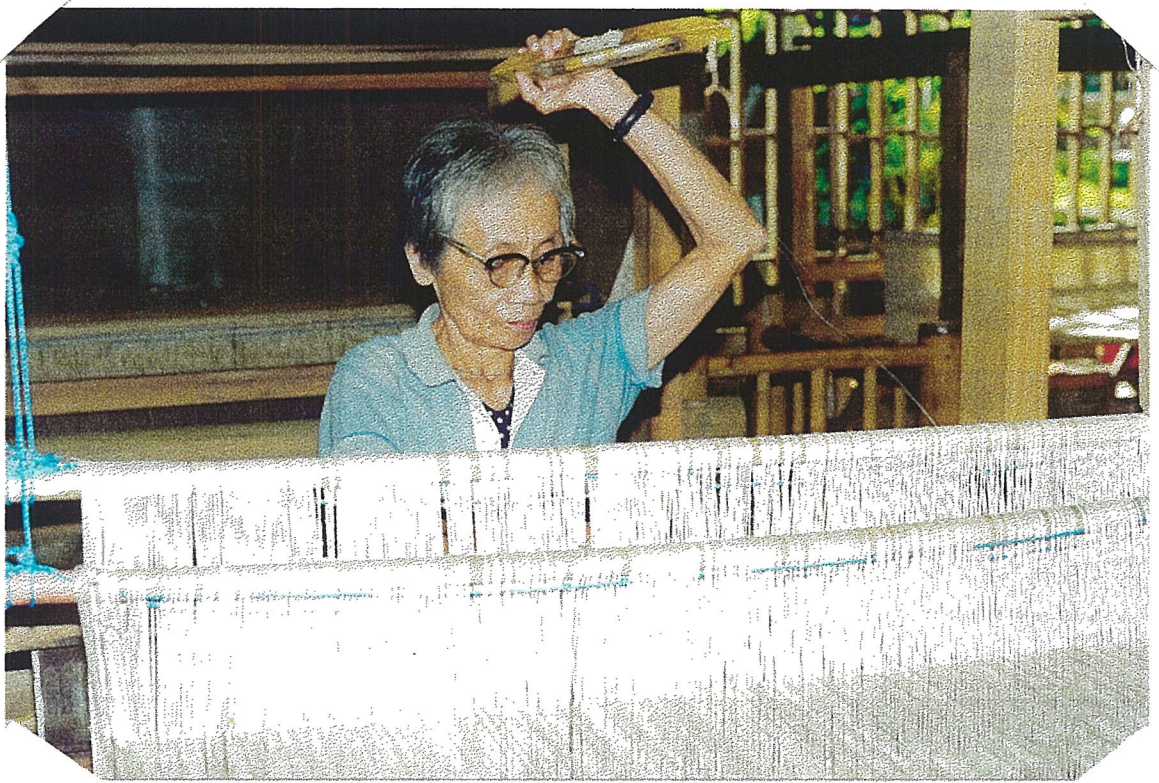
Farmers of Lopez and Calauag, Quezon engaged in fan making using young shoots and mature leaves of anahaw abundantly growing in the area.



Two school children temporarily skipped classes to help parent weave anahaw leaves for fan and other miniature products.



A Higaonon forest settlers in Bukidnon transports his harvest of fresh abaca by foot to the nearest abaca stripper for further processing.



A traditional "Higaonon" weaves natural hinabol fibers.



Hinabol fibers tinted with synthetic dyes.



A woman displays her talent doing the “salapid,” a traditional style of weaving pandan leaves to accent hinabol weaving fabrics.



“Pangayukay” a step in preparing the fibers where individual fiber strands of the same length and thickness are tied together from one end to the other as shown by a “Higaonon” tribe in Bukidnon.



A "Sumilao" tribe shows his broom made from tiger grass ready for sale along the national highway in Bukidnon.



Farmers in Barangay Bosok-bosok in San Ildefonso Peninsula, an area of IDC displays *Freycinetia* Sp. (white vine) as the most important vine species for vine craft and Christmas decors both for local and export purposes.



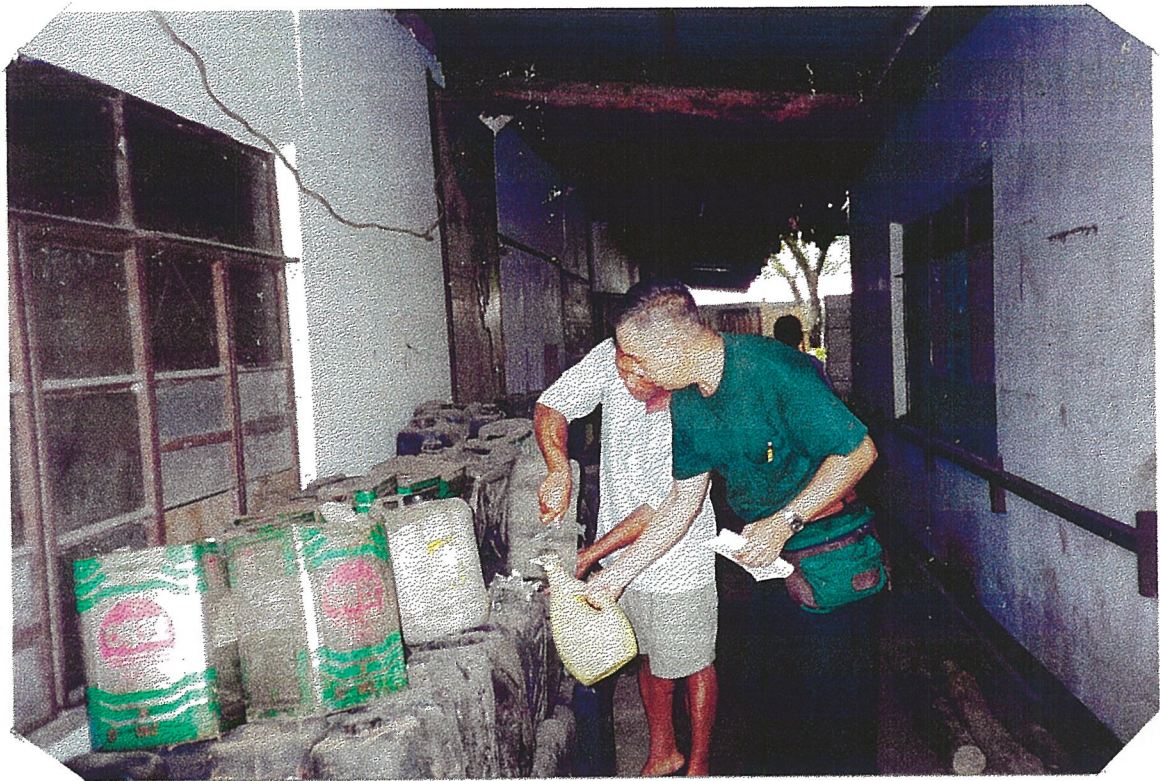
Officers of SAKADA are cooperative enough for interview of their role and participation in the collection and utilization and conservation program of NWFP found within their CADI.



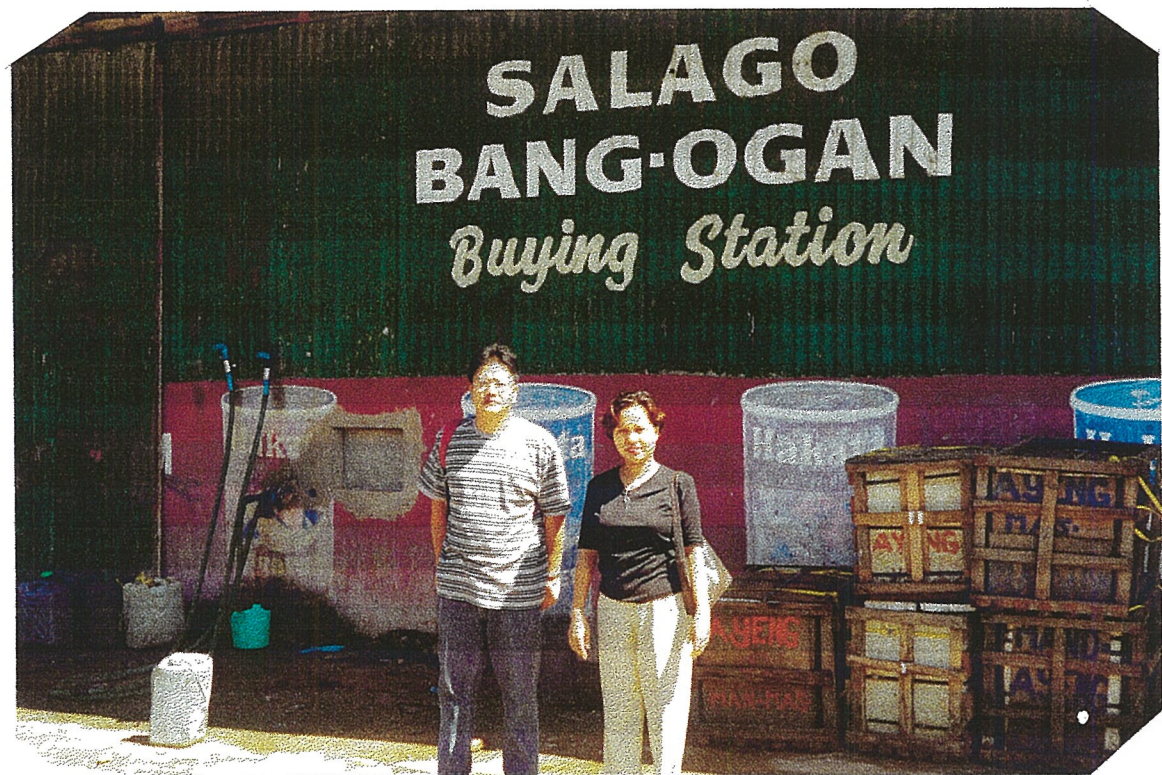
Military men (PNP) stationed at Calabangan, Casiguran where SAKADA (Samahan ng Katutubong Dumagat sa Aurora) headquarters is found teaches “Dumagats” about basics in Math, Reading and Writing following DILG’s program in extension works.



Collected stumps, tops and branches of Narra and Tindalo ready for transport to Didiawan area for processing into wood tiles.



Balau resins from Apitong species (*Dipterocarpus spp.*) are illegally and injuriously collected in the forests of Samar province.



Collected barks of wild salago piled in a warehouse in Masbate. The market of raw salago barks is in Legaspi City where shipping is done 3 times a year with 7 to 9 tons per delivery.

TRAINING COURSE ON ALMACIGA RESIN TAPPING

Description

The course provides essential basic and practical knowledge of tapping almaciga trees following scientifically tested procedure aimed at sustained resin production.

The course focuses on the development or enhancement of skills in almaciga resin tapping and emphasizes hands-on learning.

It is designed for almaciga resin licensees, collectors, and other groups intending to go into almaciga resin tapping.

The course duration is five days but may be shortened to three days given time constraint.

The number of participants is limited to a maximum of 15 per session for manageability.

Objective and Expected Output

The course, in general, aims to equip the participants with knowledge and skills in tapping almaciga trees for resin to obtain optimum yield and good quality resin without injuring the trees.

At the end of the course, the participants are expected to be able to:

1. Relate the theoretical knowledge on the stem structure, resin production and pests and diseases of almaciga to the tapping process; and
2. Perform the scientific process of almaciga resin tapping.

Topic Outline

1. Introduction
 - 1.1 Types/sources and characteristics of almaciga resin
 - 1.2 Economic importance
 - 1.3 Uses of almaciga resin
2. Basic structure of the stem
 - 2.1 Bark
 - 2.2 Wood
 - 2.3 Cambium

3. Resin production in the tree
 - 3.1 Nature of resin production and exudation
 - 3.2 Factors affecting resin production
4. Common pest and disease of almaciga
5. The tapping process
 - 5.1 Tapping malpractices
 - 5.2 Scientific tapping procedure
6. Safety precautions in tapping

Method

Lecture discussion
Demonstration
Supervised skill practice

Evaluation

Knowledge and skills gained will be assessed as participants perform the tapping procedure through supervised skill practice. The location and appearance of cut, technique in acid spraying, amount of acid sprayed and related details will be evaluated.

Resource Persons

For. Arsenio B. Ella
Mr. Ivan M. Javier

Module A
INTRODUCTION TO ALMACIGA RESIN TAPPING

Description	This module gives a background and introduces the course by elucidating on the characteristics and sources of almaciga resin, its economic importance and various uses.
Expected Output	At the end of the module, the participants are expected to be able to: <ol style="list-style-type: none">1. Differentiate the types of almaciga resin;2. Explain its importance; and3. Identify its various uses.
Method	Lecture-Discussion
Evaluation	Questions and answers on what has been discussed will be generated.
Resource Person	Ivan M. Javier

Module A
INTRODUCTION TO ALMACIGA RESIN TAPPING

Characteristics of Almaciga Resin

Almaciga resin, known commercially as Manila Copal, is a white to yellowish exudates from the bark of a wounded or tapped tree (*Agathis philippinensis* Warb) or its roots.

The exudates are soft when fresh but harden over time and turn amber-colored.

The resin is soluble in alcohol, benzene and ether.

Types of Almaciga Resin

1. Ground or fossil resin

This is exuded by the roots and therefore, obtained from underground of previous almaciga stands.

It is hard, amber-colored and has been under the ground for sometime, hence, also called exudates.

Gives the best quality resin.

2. Surface or tapped resin

This is exuded by the bark when the trunk is wounded or tapped.

It is easier to avail of than fossil resin.

Types of Almaciga Resin Available in the Market

1. Freshly gathered from tapped trees after two weeks
2. Gathered from tapped trees after one or more months
3. Hard exuded copal from wounds gathered after a few years
4. Underground fossil copal dug up several years after exudation

Market for Almaciga Resin

Foreign
Local paint manufacturer, wood finishers

**Almaciga Resin
Production**

From 1988-1997, an average of 759,000 kg. yearly

**Exportation of
Almaciga Resin**

From 1988-1997, an average of 348,100 kg. yearly. 1997;
380,974 kg. valued at US\$ 303,000

Uses of Almaciga Resin

1. For the manufacture of varnish, lacquer, paint, soap, printing ink, linoleum, plastic, water proofing materials, paper size.
2. For kindling fire or as torch.
3. As incense in religious ceremonies.
4. As smudge for mosquitoes.

Module B
BASIC STRUCTURE OF THE STEM

Description	<p>After getting a background on almaciga tapping, it is important to have a working knowledge of the parts of the stem that are involved in tapping.</p> <p>This module provides an understanding of why it is essential that proper tapping procedure be followed.</p>
Expected Output	<p>At the end of the module, the participants are expected to be able to relate the basic structure of the stem to tapping.</p>
Topic Outline	<ol style="list-style-type: none">1. Introduction2. The bark<ol style="list-style-type: none">2.1 What consist of2.2 Function3. Wood portion<ol style="list-style-type: none">3.1 What consist of3.2 Function4. The cambium<ol style="list-style-type: none">4.1 What consist of4.2 Function4.3 Role in the tapping process
Method	<p>Lecture-Discussion</p>
Resource Person	<p>For. Arsenio B. Ella</p>

Module B
BASIC STRUCTURE OF THE STEM RELEVANT TO TAPPING

Introduction

A look into the basic structure of the stem is important in understanding the tapping process.

Major Subdivisions of the Cross Section of the Stem

Bark
Cambium
Wood

The Bark

This consists of active living cells, a large number of resin ducts which store almaciga resin; and phloem elements or vessels that transport food manufacture in the leaves to other parts of the tree including the roots.

The Wood

This contains the xylem elements or vessels that conduct water minerals from the roots to the leaves; and small resin ducts.

The xylem consists of non-living cells.

The Cambium

This is a very thin region lying between the bark and the wood. It is responsible for the formation of new tissue like new phloem and new xylem elements. It is therefore responsible for the regrowth or formation of new bark when this is cut.

It is responsible for the increase in tree diameter and healing of wounds.

It is made up of actively dividing cells.

Relevance of the Stem Structure to Tapping

The depth of the tapping cuts should not go beyond the bark. Otherwise, it will damage the cambium.

**What Happens with
Damage Cambium**

With a damaged cambium, the cut will not heal or if it does, very slowly, exposing to insect and fungal attack. The xylem cells do not react to wounding since they are dead cells. Healing comes only from the sides of the cut or wound, hence slower.

**What Happens with
Undamaged Cambium**

The process of healing immediately starts after wounding since the actively dividing cells in the intact cambium are at work forming a new bark. Healing comes from all directions, hence fast.

Module C
RESIN PRODUCTION IN THE TREE

Description	<p>This module looks into the nature of resin production in the tree, in a very simple approach.</p> <p>It aims at developing a better understanding of the tapping process.</p>
Expected Output	<p>At the end of the module, the participants should be able to relate the nature of resin production and storage tapping.</p>
Topic Outline	<ol style="list-style-type: none">1. Introduction2. Nature of resin production and exudation3. Factors affecting resin production
Method	<p>Lecture-Discussion</p>
Resource Person	<p>For. Arsenio B. Ella</p>

Module C
RESIN PRODUCTION IN THE TREE

Introduction	Knowledge of the nature of resin production likewise enhances understanding of tapping process.
Where Resin is Produced	Resin is manufactured by special cells surrounding the resin ducts or canals found in the leaves.
Where Resin is Stored	The newly manufactured resin is directly excreted into the resin ducts in the leaves. The resin ducts extend to the bark of the stem and roots. The resin is stored in these ducts.
Resin Exudation	<p>Resin ducts and phloem elements or vessels that transport food from the leaves to other parts of the tree are oriented along the length of the stem.</p> <p>The resin ducts had to be cut for resin to come out, hence, the horizontal tapping cut.</p> <p>Tapping cuts food transport. The tree reacts to this by producing and excreting more resin until the stored food is exhausted.</p> <p>Tapping or wounding the tree is a source of stress to the plant. This stress actually triggers the plant to produce resin.</p>
Factors Affecting Resin Production	<p><u>Vigor of the tree</u></p> <p>The vigor of the tree is exhibited by tree size and tree crown density.</p> <p>A tree with heavy well-proportioned crown produces more resin than those with sparse crown. This is obvious since the leaves manufacture the resin</p> <p>Large trees which have bigger bark surface and normally, heavier crowns produce more resin than smaller trees.</p>

Location

Certain site characteristics presumably influence resin production. Studies conducted by the Ecosystems Research and Development Bureau (ERDB) showed variable production in different places. Resin production was poor in Zamboanga. In Abra, more trees did not produce resin in higher elevations than in lower elevations.

Heredity (Inherent Capacity)

Given approximately the same tree size and crown density, resin production of trees in the same location has been found to differ.

Module D
COMMON PESTS AND DISEASE OF ALMACIGA

Description	This module introduces the participants to harmful biological agents that may destroy almaciga trees due to improper tapping.
Expected Output	At the end of this module, the participants should be able to articulate the destructive effects of the common pests and disease attacking almaciga trees.
Topic Outline	<ol style="list-style-type: none">1. Common pests and destructive effects2. Common disease<ol style="list-style-type: none">2.1 Effect of rotting2.2 Patterns of decay in wood rot
Method	Lecture-Discussion
Resource Person	For. Arsenio B. Ella

Module D
PESTS AND DISEASE OF ALMACIGA

Introduction	When the tapping cut reaches and damages the cambium, the wound will not heal or will heal very slowly. This provides an avenue for pests and disease microorganisms.
Serious Pests	<p>The almaciga tapper who cuts deep into the woody stem and provides an avenue for wood rotting organisms to get in or place to live.</p> <p>People who indiscriminately cut the stem and branches of almaciga tree and likewise provide a way for destructive microorganisms to get into the wood</p>
Common Disease	Wood rot
Susceptibility to Wood Rot	Overmature trees are more susceptible to wood rot than younger trees.
Patterns of Decay in Wood Rot	<p>There are three patterns of decay:</p> <ol style="list-style-type: none">1. Rotting in the center of the wood;2. Rotting in small pockets distributed in the stem; and3. Rotting from the bark of the wood.
Effect of Rotting	<p>The rotting portion provides entry for termites that then colonize the tree. Decay continues and the tree dies.</p> <p>Rotting by itself slowly destroys the tree until it dies.</p>

Module E
THE TAPPING PROCESS

Description	<p>This module explains and demonstrates the scientific tapping method aimed at developing or enhancing skills in tapping almaciga trees. It makes much use of supervised individual skill practice</p> <p>The module provides tappers/participants the opportunity to evaluate their current practices and make the necessary improvement.</p>
Expected Output	<p>At the end of the module, the participants should be able to perform the recommended tapping procedure as gauged by the resource person.</p>
Topic Outline	<ol style="list-style-type: none">1. Introduction2. Malpractices in almaciga tapping3. Materials and tool for tapping4. The recommended tapping procedure
Materials	<p>Chalkboard, chalks Illustrations Handouts Standing almaciga tree Tapping tool 50% sulfuric acid in a plastic squeeze container</p>
Method	<p>Lecture-Discussion Demonstration Hands-on application</p>
Resource Person	<p>For. Arsenio B. Ella</p>

Module E
THE TAPPING PROCESS

Definition	Tapping is the process of inducing exudation from the bark of standing trees through deliberately made cuts on the bark. Scientific tapping follows a specific procedure meant to prolong the tapping life of the trees.
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Malpractices in Almaciga Tapping

Deep tapping that reach the sapwood
Over tapping-oversized cuts or too many cuts along the tree's circumference
Frequent rechipping

Tree Size Requirement for Tapping

At least 40 cm. diameter at breast height (dbh)

Tool for Tapping

A very sharp bolo, big knife or back hack

Materials Needed for Tapping

50% sulfuric acid
Plastic squeeze sprayer, one pint capacity

Recommended Tapping Procedure

1. Select a portion at the base of the trunk not more than 30 cm. from the ground for tapping. Lightly scraped this with bolo to remove loose bark, dirt and other foreign materials.
2. Using a sharp bolo, big knife or back hack, make a horizontal cut on the trunk, about 30 cm. long, 2 cm. wide and only as deep as the bark, not any deeper. A cut deeper than the bark will damage the cambium.
3. Spray a mist of the sulfuric acid solution on the cut with one pass of the sprayer.
4. Acid application in the right amount will prolong the life of the trees. Too much acid will kill the tissues in and around the fresh cut resulting in reduced yield.

5. To ensure that the resin is not contaminated with dirt, attach an improvised funnel made of anahaw leaf or tree bark below the cut to collect the resin.

The use of cups or gutters to collect the exudates is not necessary because this hardens in a very short time.

After a week or when the resin flow stops, collect the resin.

6. Remove another portion of the bark next to the cut going upwards. This should be of the same length but narrower, about 4 to 10 mm wide. Apply acid as in No. 3.

Tap again after the next resin collection and so on, proceeding vertically upward.

A ladder may be necessary later for convenience.

Module F
SAFETY PRECAUTIONS IN TAPPING

Description	<p>The module present possible but preventable untoward consequences of tapping</p> <p>It also gives the necessary simple safety measures in case of accidental acid spills and cuts from tapping tool</p>
Expected Output	<p>At the end of the module, the participants should be able to:</p> <ol style="list-style-type: none">1. Identify possible untoward consequences of tapping;2. Know what could be done to prevent these; and3. Know what should be done in case these happens.
Topic Outline	<ol style="list-style-type: none">1. Introduction2. Sources of accidents in tapping3. Safety measures
Method	Lecture-Discussion
Resource Person	Mr. Ivan M. Javier

Module F
SAFETY PRECAUTIONS IN TAPPING

Introduction	As in any process utilizing sharp tools and corrosive chemicals, tapping has to proceed with caution.
Sources of Accidents in Tapping	<ol style="list-style-type: none">1. The tapping tool which should be very sharp2. Sulfuric acid spills on the skin, eyes, clothing
First Aid Measure for Acid Spill on the Skin	<p>Wash the affected area thoroughly with clean water then cover with baking soda paste made by mixing baking soda with a little amount of water.</p> <p>Ordinary cooking oil may be used as substitute for baking soda paste.</p>
First Aid Measure for Acid Spill on the Eye	Wash the eye thoroughly with clean water. Follow this with another washing using line water.
What to do when the Acid Spills on Clothes	Remove the clothes immediately and wash the affected area if it is small or wash entirely.
First Aid Measure for Cuts	Check any profuse bleeding with a tourniquet. Apply antiseptic on the cut and bandage.