TECHNICAL REPORT: ECONOMIC STUDY AND STANDAR PRICE OF COMMUNITY BASED PLANTATION FOREST (HTR) PRODUCTS
Case Study in Lampung Province

By: Dr. Tuti Herawati

PROJECT TECHNICAL REPORT

Economic Study and Standard Price of Community-Based Plantation Forest (HTR) Products
Case Study in Lampung Province

Dr.Tuti Herawati

Report for Activities 3.1. & 3.2.
ITTO CFM-PD 001/10 Rev.2 (F)

Strengthening Capacity of Stakeholders for the Development
Of Community Based Plantation Forest at Three Selected Areas in Indonesia

Host Government: Indonesia

Executing Agency:
Directorate of Plantation Forest
Directorate-General of Forest Utilization
Ministry of Forestry

Starting Date of the Project: July 2011 to December 2013
Project Duration: 30 Months
Project Coordinator: Dr. Anna Indria Witasari

EXECUTIVE SUMMARY

Feasibility analysis are based on three investment criteria i.e. net present value (NPV), benefit cost ratio (BCR), and internal rate of return (IRR). The result of financial analysis indicated that the plantation of fast growing species in Lampung Province is feasible based on the value of NPV, BCR, and IRR which are NPV: Rp 9,011,550; BCR: 2.13 ; and IRR: 19%.

The determination of standard price of HTR timber used three approaches, namely.: 1) market price, 2) stumpage price, and (3) parity/social price.   The market price of *Paraserianthes falcataria* is Rp 200,000, the stumpage price is Rp 121,984, and the parity/social price is between Rp 200,000-250,000. The margin share for farmer is 27% and 73% for traders. The farmer is in the weakness position due to the position as price taker. To increase bargaining position of the farmers, there is a need for a government intervention in terms of standard price of HTR timber. The standard can be determined based on parity or social price because the price provides an opportunity to farmers to get maximum benefit.

The HTR progress in Lampung showed that total allocated HTR areas are 24,835 hectares or 68% of the reserved area.   The HTR activities at 4 of 6 HTR license holders are not in good management. The factor is commonly caused by the termination of partnership. Based on this condition, the strategies for HTR development in Lampung province are needed through: 1) institutional strengthening, 2) facilitation, and 3) farmer capacity building.

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I.   INTRODUCTION

1. 1. Background

Community Based Plantation Forest (HTR) programme provides access rights to communities living around forest areas to play an active role as agents of development in plantation forests in state-owned forest areas. The objectives of the HTR programme are to develop HTR business. Problems that could potentially be an obstacle in the development of smallholder plantations are the feasibility and HTR products marketing.

Some previous studies showed that HTR business in general, is only as a minor instead a major source of income. Research by Darusman and Hardjanto (2006); Lubis (2010), as well as Sitanggang (2009) showed that community plantation forest business has not become a significant source of household's income. On the other hands, farmers are rational individuals, meaning that the choice to engage in a business investment is determined by the potential of a profit which will be received from such business.

These conditions raise questions regarding HTR feasibility. Therefore, the feasibility analysis of HTR is important to study.

From the feasibility analysis of business, the standard price of HTR products can be identified. Besides the financial feasibility of HTR, a review that is more macro aspects of the marketing of the HTR product is also needed. Studies on HTR production marketing include market potential of timber produced from HTR activities, product marketing channel from farmer growers to industries, and profit distribution for each market actors in the market chain.

The study was conducted in Lampung province as one of the three study sites besides West Nusa Tenggara and North Sulawesi. HTR Programme in Lampung started since the year 2010. Based on the Ministry of Forestry Decree No. 47 of 15 January 2010, an area of 24,835 hectares was assigned as allocated HTR areas. However, field verification suggested a change in the allocated HTR areas size into 22,772 hectares. Six cooperatives which cover an area of 15,384 hectares or 67.7% of total allocated HTR areas have been approved for HTR license.

Many research relating to timber business have been done. However, there is a little to be done for economic analysis on HTR business. Previous research results can be used as references in the economic study on HTR. Race et al. (2009) stated that the community-based forest plantation business only provides a marginal financial benefit. Siregar et al. (2007) reported a case in Kediri where *Paraserianthes falcataria* is planted together with various

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agricultural crops. The combination provides revenue in a relatively high interest rate (17.53%). In the case in Costa Rica, Kishor and Constantino (1993) reported that business in community timber plants is more profitable than other crops at the time when bank interest rate is low. However, it is not when the bank interest rate is high. This condition becomes a reason why farmers are not interested in forest plantation business.

1.2. Problem Formulation

Feasibility and market opportunities for timber are one of critical success indicators of smallholder tree plantations. This study aims to answer some fundamental questions related to the feasibility of HTR farming. The main problems to be answered in this study are:

a. Is HTR farming financially feasible?

b. How is the wood market channel and how is the margin distributed?

c. How is an optimum price for HTR product determined?

d. What are the problems faced by HTR farmers and what are the strategies for HTR management in order for the business to develop better?

1.3. Hypothesis

Hypothesis developed in this study is that HTR business is financially feasible and has a market potential.

1.4. Purposes and Objectives

Economic study and HTR standard price are intended to provide data and information related to management strategies of smallholder plantations. Objectives to be achieved from the economic study and HTR standard price are:

1. Analyzing the financial feasibility of HTR management.

2. Inventory of marketing system in HTR management.

3. Conducting analysis on standard price of HTR products.

4. Identifying problems and constraints in the implementation of HTR programme in the study sites and formulating policy recommendations for HTR development.

1.5. Outcome and Impact

Economic study and standard price of HTR products will result in the following outcomes:

1. Data and information on financial feasibility of HTR activities.
2. Data and information on market and marketing system.
3. Data and information on standard price of HTR wood.
4. Data and information on HTR management condition and the formulation of policy strategy.

The expected impact of this study is the development of HTR business system that is beneficial to all agencies involved in HTR development. Another expected impact is the creation of conditions where HTR becomes a main business for HTR license holders.

1.6. Scope

The scope of economic study and standard price of HTR forest products are: financial feasibility study on HTR at a household level, study on potential and market chain of HTR products, determination of feasible standard-price of HTR products, analysis of problems in HTR management, and the recommendations of government policy on HTR management and marketing regulation.

II.   RESEARCH METHOD

2.1. Location and Research Respondents

The study was conducted in Lampung Province. Site selection was done intentionally (purposive sampling) that is the location of the implementation of the ITTO project CFM-PD 001/10 Rev.2 (F): "Strengtehning Capacity of Stakeholders for the Development of Community-Based Forest Plantation at Three Selected Areas in Indonesia".

Plantation forest management under HTR programme in Lampung province has started in West Lampung District to date. There are six HTR license holders (cooperatives) in West Lampung. The HTR sites spread over five Sub-Districts namely Bengkunat, South Pesisir, North Pesisir, Lemong, and Central Pesisir.

The respondents were the managers of six HTR cooperatives, members of the cooperatives, as well as HTR sharecroppers. The total respondents were 50 persons who were the managers and members of cooperatives. List of respondents is attached as Appendix 1.

Marketing study on HTR products was conducted through surveys and interviews with market actors. The determination of the respondents was done through snowball sampling, where based on information from a farmer, the next respondent to whom the timber is sold was determined. The informants as the source of data in the marketing activities were timber marketing actors, including   farmers having experiences in selling timber, village-level buyers or middlemen, sawmill owners, sawmill operators, and timber depot owners at a district and a provincial levels. The number of research informants for timber marketing activities was 18 people. List of informants in timber marketing is in Appendix 2.

Besides actors in HTR activities, which the managers and the members of cooperatives, data concerning the programme implementation of HTR was also collected from informants among the local government and the Ministry of Forestry Technical Unit (BP2HP) in Lampung Province. The Ministry Offices at the provincial level that were contacted for data collection were: 1) BP2HP Lampung Region VI, 2) the Provincial Forestry Office of Lampung Province, 3) the Provincial Office of Cooperatives, Small and Medium Enterprises Trade in Lampung Province, 4) the District Forestry Office of West Lampung, and 5) the District Office of Industry and Commerce of West Lampung District.

2.2. Data Collection Technique

Data collection techniques were:

1. Observation: by conducting direct observation of biophysical conditions in the field related to the implementation of cooperative activities in six HTR cooperatives, activities being carried out, management condition, and the condition of HTR members.

2. Literature review: data collection through reviews on the results of previous studies and reports of activities derived from relevant institutions.

3. In-depth interviews and focus group discussions (FGDs).

Data collected included primary data and secondary data. Primary data were collected by survey method, observation, or interviews using a structured question-naire to marketing actors. The list of the questions can be found in Appendix III. Primary data included data on HTR management costs and revenues, data on HTR product marketing channel, data on marketing margin distribution for each marketing actors, as well as the problems faced in HTR management. These data were collected through questionnaires, discussions and interviews with HTR license holders, merchants, and wholesalers. In-depth interviews were also conducted on local government officials to explore information on the local government programmes in HTR management and wood marketing activities.

Secondary data was collected through literature reviews or reports from relevant agencies such as the Department of Forestry and Agriculture, the Department of Industry and Trade, the Central Bureau of Statistics. Secondary data included general conditions on HTR management, data on wood-processing industries which are market potential for HTR products.

Table 1.Data and information collected

No.	Benefit of analysis/collected data	Data Source	Method of Collection
I.	**Feasibility Analysis of HTR Enterprise**		
	Data on cost and income of HTR Management activities at farmer level	HTR Farmers	Interview
II	**Market channel analysis of HTR Products**		
	Data on market channel models for HTR products	HTR Farmers Merchants	Interview
III	**Standard Price analysis of HTR Product**		
	Data on margin and cost presented by market actors	Merchants	Interview

No.	Benefit of analysis/collected data	Data Source	Method of Collection
IV.	**Analysis on strategies on policy and market development of HTR products**		
	Secondary data related to HTR management		
	General condition of area, forest resource potential , data on allocated HTR area (Target and realization of HTR development in study sites)	Director General (DG) of Forest Utilization and Provincial Forestry Office	study reports
.	Related regulations: - HTR establishment and development - maketing of HTR products - user industry of HTR products	DG of Forest Utilization, DG of Plannology, and Local Government	study reports
	Data and information related to market and marketing of wood products		

2.3. Data Analysis

Data were analyzed qualitatively and quantitatively. Qualitative analysis was done to explore the general and specific description of the study sites, marketing channels and marketing structure. Quantitative analysis was done to identify business feasibility, market variability by using marketing margin analysis. In summary, the stages of analysis and analytical models used to answer the research objectives were:

1. HTR cost analysis which was intended to determine all cost components and the amount of costs expended by producers/farmers in the production process of HTR timber.

2. Financial Analysis of HTR farming, including analysis of BCR, NPV and IRR, to determine the feasibility of HTR farming

3. Analysis of the trade system to determine the distribution of wood from the manufacturer to the end users. Analysis of marketing margin and profit margin was done to identify the benefit received by each of the businesses actors.

2.3.1. Financial Feasibility Analysis

In order to find a comprehensive measure of the feasibility of a project/ investment, a wide range of index called the investment criteria has been developed. Each index uses discounted present value of current benefits and costs over the life of a project.

The following are the investment criteria used in the feasibility analysis of HTR in Lampung Province.

1. Net Present Value (NPV).

2. Benefit Cost Ratio (BCR).

3. Internal Rate of Return (IRR).

- NPV (*Net Present Value*)

NPV calculation in an investment appraisal is a practical way to determine whether a project is profitable or not. NPV is the difference between the Present Value of flow of Benefit and Present Value of flow of Costs. The project is profitable if it has a positive value of NPV (NPV> 0).

Explanation:

$$NPV = \sum_{t=1}^{n} \frac{Bt - Ct}{(1+i)^t}$$

Bt = Benefit at year t

Ct = Cost at year t

t = length of investment

i = interest rate

Criteria:

If NPV > 0, meaning profitable, where the benefit received by the project is higher than total cost expended.

If NPV = 0, meaning break even point, where the benefit received is only enough to cover total cost expended.

If NPV < 0, meaning loss, where total cost expended is higher than benefit received.

- *Benefit Cost Ratio* (BCR)

BCR is an assessment done to identify the level of efficiency of the use of a cost which is a comparison between the positive net present value and the negative net present value. A project is feasible and efficient to be implemented if the value of the Net B/C is > 1, meaning that the benefits outweigh the costs expended and the opposite applies.

Explanation:

$$B/C = \frac{\sum_{i=1}^{n} \frac{Bt}{(1+i)^t}}{\sum_{i=1}^{n} \frac{Ct}{(1+i)^t}}$$

Bt = Benefit at year t

Ct = Cost at year t

i = prevailing interest rate

t = HTR project period

n = HTR project age

Criteria:

If B/C>1 = profitable

if B/C<1 =   loss

- *Internal Rate of Return (IRR)*

IRR is the value of the discounted interest rate that makes the NPV of a project/investment = 0. IRR is used to determine the economic ability of the business unit whether the investment can be done or not.

$$IRR = i_1 + \frac{NPV_1}{NPV_1 - NPV_2}(i_2 - i_1)$$

Explanation:
- NPV_1 = NPV with the lowest positive value
- NPV_2 = NPV with the lowest negative value
- i_1 = Interest rate producing the lowest positive value of NPV
- i_2 = Interest rate producing lthe owest negative value of NPV

Investment criteria:
- If IRR > i ;   meaning investment is feasible
- If IRR = i ;   meaning investment is on a break-even point
- If IRR < i ;   meaning investment is not feasible

2.3.2. Marketing Analysis and Base Price

To find the level of marketing efficiency, this study uses several variables, namely the analysis of profit margin; 2) marketing margin, and 3) the level of operational efficiency by using the parameters of mark-up on selling (Desai, 2001).

1.   Profit margin

$$Ski = \frac{ki}{Pr - PF} \text{ X } 100\%$$

$$Sbi = \frac{bi}{Pr - PF} \text{ X } 100\%$$

$$Sp = \frac{Pf}{Pr} \text{ X } 100\%$$

2.   Marketing Margin: Mp = Pr – Pf atau MP = $\sum$ bi + $\sum$ ki
3.   Operational efficiency level based on mark up on selling

$$Mark\ up\ on\ selling = \frac{\text{Marketing Margin}}{\text{Sales Price}} \text{ X } 100\%$$

Explanation:

Mp = Marketing Margin;

Pr = Price at consumer level (user);

Pf = Price at producer level (farm);

bi = 1st cost of marketing ;

ki = 1st profit ;

Ski, Sbi = benefit received by marketing institution;

Sp = price contribution received by producer.

To set a base price of HTR timber sales, three approaches, namely the calculation of market price, stumpage price, and social/parity price can be applied (Irawati, et al., 2008)

- The market price is the price established through market mechanisms, where there is a bargaining process between consumers and producers who meet in the HTR market. Data on HTR timber market price at a farm level can be obtained from HTR farmers, traders at a village level and in the industries that directly buy wood from farmers / wood producers.

- Stumpage price is the price that reflects the value of the stand. HTR farmers expect that they are able to cover all costs required to produce wood and expect to get profit from their efforts. Costs expended in HTR development are all cost components ranging from the cost of seed procurement, planting activities, costs of stand maintenance until the trees are ready for harvesting and selling.

- The social / parity price is the price that produces the best allocation of resources so it will produce the highest profit. Social price is calculated on the basis of opportunity cost that will give the most profitable alternative for HTR wood products by using parity price approach. HTR social price of wood is derived from the international market price.

2.4 Species of HTR plantation and Assumption

In accordance with the HTR concept, the tree species are fast growing species with a six to eight year life cycle. Based on interviews and field observations, the tree species selected for HTR were *Paraserianthes falcataria* and *Anthocephalus cadamba*. Both species have a pretty good market potential. *Paraserianthes falcataria* has proven to be accepted in the

wood processing industries. Meanwhile, *Anthocephalus cadamba* started to attract many people, although the market for *Anthocephalus cadamba* has not been predicted yet. No data and information were obtained regarding to farmers' experiences on selling *Anthocephalus cadamba* wood since *Anthocephalus cadamba* they planted was only one year old and has not ready for harvesting. For the reason, financial and market price analysis, stumpage and social price of this fast- growing species is represented only by data on *Paraserianthes falcataria.*

Besides these two tree species, many people in Lampung Province also plant a local tree species namely *Michelia spp.*. Planting cycle of *Michelia spp.* is longer than *Paraserianthes falcataria* and *Anthocephalus cadamba*, which is 10-30 years.

To perform a financial analysis of HTR plants, fast growing species such as *Paraserianthes falcataria* and *Anthocephalus cadamba* would be used. Some basic assumptions were required in the calculation. The assumption was obtained from the analysis of conditions in the field.

Assumptions used are:

1. HTR development analysis unit used is 1 (one) hectare.
2. Planting cycle used is 8 years, in accordance with the HTR concept - fast growing species (*Paraserianthes falcataria* and *Anthocephalus cadamba*). As discussed above, these species have been chosen by farmers in Lampung because of its fast growing characteristics, short life cycle, and has a market potential.
3. Data on planting costs was assessed based on interviews with farmers in Lampung. The planting cost per hectare for *Paraserianthes falcataria* was Rp 9,105,000. This cost is higher than the standard for loan disbursed, which is regulated by the Regulation of the Head of Centre for Forest Development Funding No. P.01/P2H-1/2010. The loan disbursed is Rp 8,531,900 per hectare.
4. The market price of *Paraserianthes falcataria* timber based on market survey and interviews is Rp 200,000 for each cubic meter in the form of standing tree.
5. The number of trees that grow per hectare until the end of the cycle (8 years) is as many as 400 trees. This assumption is adjusted to the minimum requirements set by the government in assessing the success of HTR.
6. The interest rate (i) used is 10% per year.

III.   GENERAL PICTURE OF HTR PROGRAMME IN LAMPUNG PROVINCE

3.1.   HTR Development in Lampung Province

Based on the Regulation of the Minister of Forestry No. HTR. 47/Menhut-II/20120 of 15 January 2010 on allocated HTR areas, total area allocated for HTR in Lampung is 24,835 hectares. West Lampung District has issued HTR license for two HTR cooperatives in 2010, three cooperatives in 2011, and one cooperative in 2012. Figure 1 shows the areas of HTR areas managed by each cooperative in Lampung Province. Table 2 presents data on the six cooperative holders in Lampung Province.
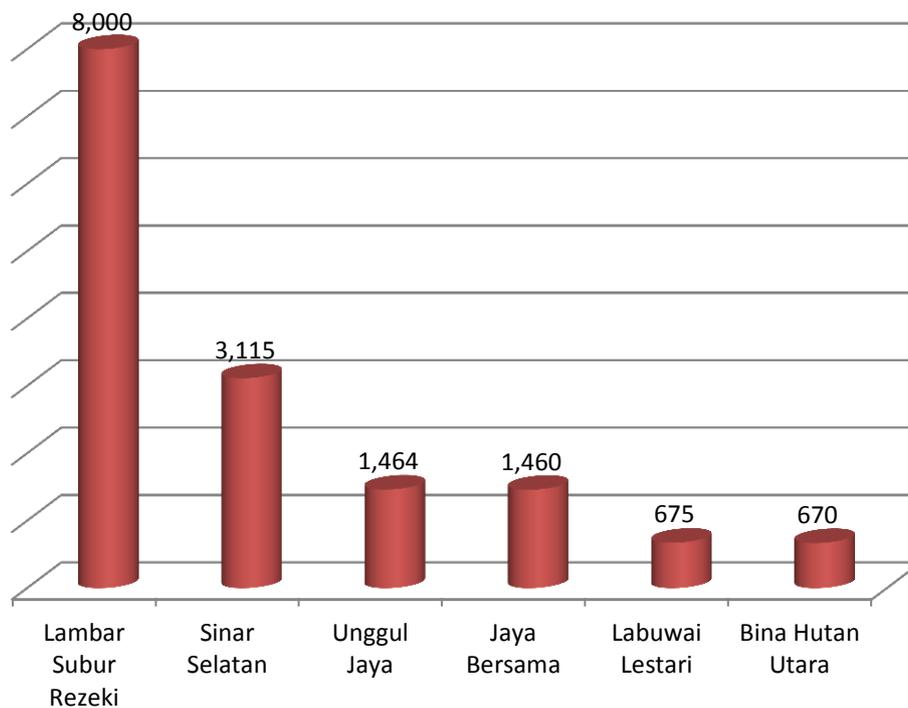
Figure 1. HTR area (ha) of each cooperative in Lampung Province

Table 2. HTR cooperative holders in West Lampung

No	Name of HTR cooperative holders	Decree of Head of District	Date	Area size (Ha)	Location	Location
1.	Cooperative Lambar Subur Rezeki	B/296.a/KPTS/11.11/2010	21 October 2010	8,000	Pekon Tanjung Kemala Bengkunat Belimbing Sub-District	Unit I Ngambur Unit II Bengkunat Unit III Bengkunat Belimbing
2.	Cooperative Sinar Selatan	B/319/KPTS/11.11/2010	16 November 2010	3,115	Pekon Biha South Pesisir Sub-District	HPT South Pesisir Sub-District
3.	Cooperative Bina Hutan Utara	B/153/KPTS/11.14/2011	23 March 2011	670	Pekon Kota Karang North Pesisir Sub-District	HPT Pekon Batu Raja and Pekon Gedau, North Pesisir Sub-District
4.	Cooperative Jaya Bersama	B/398/KPTS/11.14/2011	30 June 2011	1,460	Pekon Malaya Lemong Sub-District	HPT Pekon Malaya, HPT pekon Suka Mulya, HPT Pekon Paga Dalam, and HPT Pekon Cahaya Negeri, Lemong Sub-District
5.	Cooperative Unggul Jaya	B/398.a/KPTS/11.14/2011	30 June 2011	1,460	Pekon Rata Agung Lemong Sub-District	HPT Pekon Rata Agung and HPT Pekon Lemong, Lemong Sub-District
6.	Cooperative Labuwai Lestari	B/121/Kpts/II.14/2012	7 March 2012	675	Pekon Pahmugan Central Pesisir Sub-District	HPT Pekon Pahmungan, Central Pesisir Sub-District
	Total			15,384		

Based on the development condition, HTR management activities at each HTR cooperative holders can be divided into three groups, which are:

o Progressive Cooperative Group: Cooperative which independently manage HTR activities as in the case of Lambar Subur Rezeki Cooperative.

o Progressing Cooperative group: Cooperatives which just started HTR management activities i.e. the preparation of Work Plan and Annual Plan (RKU/RKT) and planting. Bina Hutan Utara and Jaya Bersama are under this category.

o Stagnant Cooperative group: Cooperative that has not started HTR activities yet after HTR license was issued. They are Sinar Selatan, Unggul Jaya and Labuwai Lestari cooperatives. Activities development at each HTR Cooperative Holders is presented in Table 3.

Table 3. Activities development of IUPHHK HTR license holders in Lampung

No	Cooperative	IUPHHK	Stage of Activity			
			Inventory	RKU/RKT	Planting	Industry establishment
1	Lambar Subur Rezeki	21 October 2010	Completed	In process of validation	Initial stage	Initial stage
2	Bina Hutan Utara	23 March 2011	Completed	Completed	Initial stage	
3	Jaya Bersama	30 June 2010	Initial stage			
4	Sinar Selatan	16 Nov 2010				
5	Unggul Jaya	30 June 2010				
6	Labuwai Lestari	7 March 2012				

3.2. Problems in HTR management in Lampung Province

Problems faced by each cooperative vary. Based on interviews and FGDs, problems faced by cooperatives were as follows:

1. Discontinuity of partnership between entrepreneur and cooperative members. At the beginning, partner initiated to accelerate the cooperative establishment until HTR license was issued. However after license was issued, the relationship between partner and local

community ended. This resulted in the activity discontinuation. The reason for the partnership discontinuation was no more interest from entrepreneurs to continue HTR activities. This information was obtained from cooperative members. However, clarification from partners was needed to identify the reasons behind such condition.

2. Lack of understanding from cooperative managers and members who were local community on HTR regulations.   This was identified by the absence of activities after the partner stopped providing facilities and facilitation in the activities. It was also resulted from the instant process of cooperative establishment by partner, causing a minimal participation of local community in the formation and management of the cooperative.

3. Limited financial capital. Cooperative which was reorganized and restructured for its HTR activity planning such as Jaya Bersama cooperative faced a financial problem. Field activities such as individual boundary mapping, stand inventory, workplan formulation, and planting activities needed considerable financial support. Meanwhile, financial capital resource was still limited to member's contribution and voluntary donation. At the same time, the early stages of HTR development required considerable amount of capital. Therefore, Centre for Forest Development Funding (BLU) support to provide loan to cooperatives was very much needed. The ability of cooperative management to access loan from BLU was also poor.

4. HTR facilitators have not optimally facilitated HTR activities. The facilitation by facilitators assigned by the Technical Office Unit of DG of Forest Utilization (BP2HP) was still limited to the preparation of HTR work plan and annual plan. The problems with HTR facilitators were the recruitment system and performance evaluation which still needed improvement.

IV. RESULT AND DISCUSSION

4.1. Financial Analysis of HTR Business

For the financial analysis of HTR business, data analysis on the stages of activities of HTR business, analysis on HTR costs and revenues, and the feasibility analysis using parameters of NPV, BCR, and IRR are needed.

4.1.1. Stages of Activities in HTR Business

The following are stages of activities done for one rotation of a plant species having a life cycle of eight years.

Table 4. Stages of activities in a HTR business

No	Activity Component	Year								
		0	1	2	3	4	5	6	7	8
A	PLANTING									
1	Nursery and seedling	√	√	√	√	√	√	√	√	√
2	Land preparation	√	√	√	√	√	√	√	√	√
3	Planting	√	√	√	√	√	√	√	√	√
B	MAINTENANCE									
1	Tending year 1	√	√	√	√	√	√	√	√	√
2	Tending year 2		√	√	√	√	√	√	√	√
3	Tending year 3			√	√	√	√	√	√	√
4	Extended tending year 1				√	√	√	√	√	√
5	Extended Tending year 2				√	√	√	√	√	√
C	FOREST PROTECTION									
1	Pest and disease control	√	√	√	√	√	√	√	√	√
2	Fire control	√	√	√	√	√	√	√	√	√
3	Forest safeguarding	√	√	√	√	√	√	√	√	√
D	HARVESTING/FELLING									√

4.1.2. Cost Component of HTR Business

Cost component assumption is for a one-hectare planting area. Data on cost was obtained from interviews with farmers planting *Paraserianthes falcataria* and *Anthocephalus cadamba*. These two species have relatively similar cost component. Differing factor between the two species is the price of seedlings. Other components such as cost for land preparation, planting and tending are relatively the same.

Table 5. Cost component for HTR business per hectare for fast growing species (*Paraserianthes falcataria*)

No	Activity component	Unit (Ha)	HTR Unit Price (Rp)
A	PLANTING		
1	Nursery and Seedling	Ha	1.380.000
2	Land Preparation	Ha	3.600.000
3	Planting	Ha	2.000.000
	Total A		6.980.000
B	MAINTENANCE and PROTECTION		
1	Tending year 1	Ha	475.000
2	Tending year 2	Ha	450.000
3	Tending year 3	Ha	400.000
4	Extended Tending 1	ha	400.000
5	Extended Tending 2	Ha	400.000
	Total B		2.150.000
	Total A + B	**Ha**	**9.105.000**

4.1.3. Income from HTR Business

Planting pattern done by community at the HTR sites in West Lampung District is monoculture, without any other plants including food crops. Therefore, the source of income for farmers is the plantation yield harvested in the end of planting cycle (an eight-year cycle) as shown in Table 6.

Table 6. Farmers' income from HTR business per hectare

Planting cycle	8 year
Minimum increment per hectare at the end of planting cycle	80 m3/ha (annual increment of 10m3 / ha)
Maximum increment per hectare at the end of planting cycle	320 m3 / ha (annual increment of 40m3 / ha)
Market price of *Paraserianthes falcataria* wood	Rp 200,000/m3
Minimum income per hectare	Rp 16,000,000,00
Maximum income per hectare	Rp 64,000,000,00

Assumptions of minimum and maximum increment of *Paraserianthes falcataria* was based on result of research by Lemmens (1993) which stated that average annual volume increment of *Paraserianthes falcataria* varies between 10-40 m3/ha.

Based on analysis in Table 6, income expected by farmers is around Rp 16,000,000 to Rp 64,000,000. With the average annual increment of 25 m3 per hectare, income at the end of the 8th year is Rp 40,000,000.

4.1.4. NPV, BCR, and IRR Analysis

To calculate the financial analysis of HTR business, a discount rate of 10% is used (adjusted to interest rate for deposit of State-owned Banks in the year 2012). Reduction of benefit and cost at certain discount rate is a calculation to determine the feasibility of an investment. Criteria used in the calculation of evaluation whether HTR business is feasible or not are NPV, BCR, IRR (Andayani, 2008).

Result of analysis of financial feasibility of HTR business is presented in Table 7. Assumption used in the calculation of this financial analysis is by using the median of harvesting income of Rp 40,000,000. Feasible financial parameters at that level of income shows that HTR business is feasible with NPV value of Rp 9,911,550; BCR 2.13, and an IRR of 19%.

Table 7. Financial analysis of *Paraserianthes falcataria* HTR plantation

No	Activity Component	Year								Total
		1	2	3	4	5	6	7	8	Total
A	PLANTING									
1	Nursery and Seedlings	1,380,000								
2	Land Preparation	3,600,000								
3	Planting	2,000,000								
B	TENDING									
1	Tending year 1	475,000								
2	Tending year 2		450,000							
3	Tending year 3			400,000						
4	Extended tending 1				400,000					
5	Extended tending 2					400,000				
	TOTAL COST / HA	7,455,000	450,000	400,000	400,000	400,000	-	-	-	9,105,000
	INCOME								40,000,000	
	BENEFIT	(7,455,000)	450,000)	(400,000)	00,000)	(400,000)	-	-	40,000,000	
	Interest 10%									
	DF	1.000	0.909	0.826	0.752	0.683			0.467	
	DC	(7,455,000)	(409,050)	(330,400)	(300,800)	(273,200)	-	-		
	DB								18,680,000	
	NPV									9,911,550
	BCR									2. 13
	IRR									19%

DF = Discount Factor, DC= Discount Cost, DB=Discount benefit

The calculation of feasibility criteria for HTR business resulted in an NPV value of Rp 9,911,550. Since the value of NPV is >0, it means that HTR business is profitable because the benefit received by the enterprise is higher than the total cost expended. This calculation also shows that the present value of net profit received by HTR farmers has a positive value during one rotation of *Paraserianthes falcataria* plantation.

The calculation of B/C ratio is to know whether with the cost expended, a higher benefit will be received. The calculation of B/C shows a positive value (2.15). This means that *Paraserianthes* HTR business is feasible to be done. This also means that for expenditure of Rp 1, a benefit of Rp 2.15 will be received.

The calculation of IRR shows the average level of annual profit for the enterprise doing the investment. It is expressed in a percentage (Gittinger, 1986). The calculation shows that a value of IRR is 19%. This value is higher than the value of i (10%). It means that *Paraserianthes falcataria* HTR business is feasible to be done because the value of profit is much higher than the prevailing interest rate.

The financial analysis uses the assumption of an average annual increment of 25 m3 per hectare. Lemmens (1993) stated that the annual increment of *Paraserianthes falcataria* is around 10-40 m3 per hectare. Therefore, parameter value of financial analysis can be simulated by using an increment value approach. Simulation value of NPV,BCR, IRR is based on increment shown in Table 8.

Table 8. Simulation of financial analysis based on an increment value

Cost	Rp 9,105,000	
Planting cycle	8 year	
Increment	10 m3/year	40 m3/year
NPV	(-) Rp 1,296,540	Rp 21,119,550
BCR	0.85	3.41
IRR	4%	28%

From the Table above, it is identified that if annual increment is only 10 m3/ha, the plantation business is not feasible to be done. This is also shown by the value of a negative NPV, and BCR (less than 1). At the condition of minimal increment, the business becomes feasible, if wood price increases to minimum Rp 225,000 per cubic meter.

In the meantime, at the optimistic increment value of maximum 40 m3 per hectare, NPV value will automatically increase to Rp 21,119,550; BCR to 3.41; and IRR 28%. In the optimal increment value, a low wood price will still make the enterprise to be feasibly done.

Simulation analysis shows that at the optimal increment, wood price could still be accepted at Rp 65,000.

This price simulation analysis is an initial information to get a description on determining a basic price of wood. However, below will be described the method used to determine a base price of wood based on the methodology of market value, stumpage value, and parity value.

4.2. Market Analysis and Market Channel of HTR Products

4.2.1. Market and Marketing of Community Produced Wood in Lampung Province

To support successful HTR management, market assurance for HTR products is needed. HTR wood marketing activities in Lampung Province has not been identified, since HTR activities had just started at the initial stage of planting. The age of trees was only around 9 months (interview with the leader of BHU cooperative).

The potential of wood market in Lampung province can be identified from wood processing industry data. Installed capacity of wood processing industry in Lampung is 567,900 m^3 per year. The details of each District are shown in Figure 2.
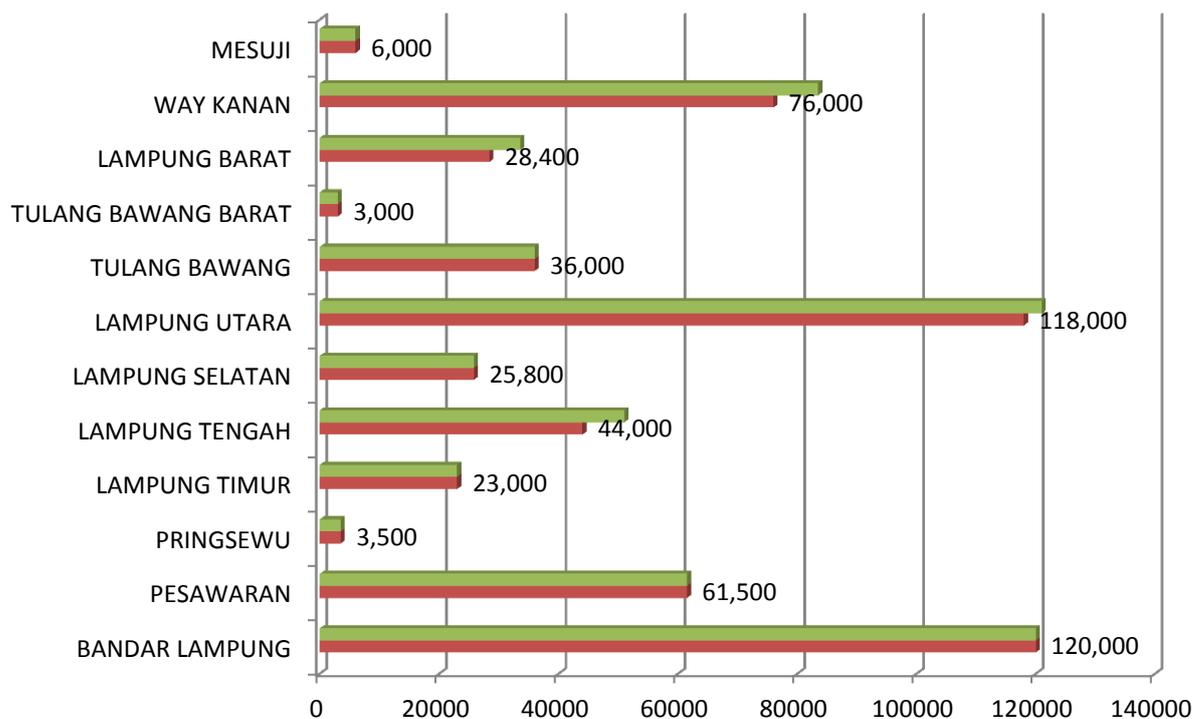

Figure 2. Wood processing industry in Lampung (Source BP2HP Wil VI Lampung)

In general, those industries produce sawn timber. The number of sawmill is 106 units from a total of 120 industries (88%). There are 9 units of veneer processing industries, 4 plywood mills, and one unit of furniture factory with a capacity of 400 m3/year (Figure 3).
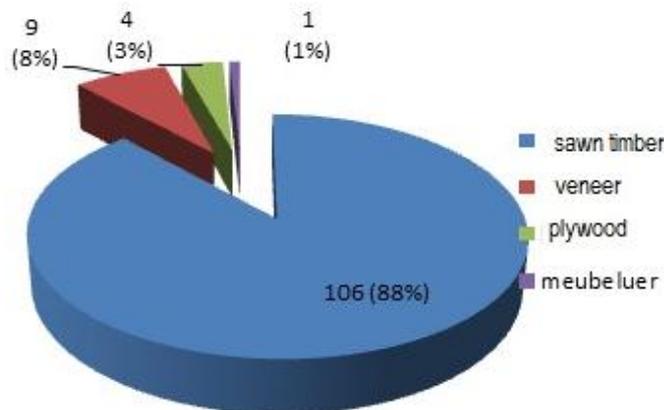
Figure 3. Types of industry in Lampung Province

In addition to high capacity industries, there are also small and medium scale wood processing industries that could absorb wood market from Lampung and its surrounding regions. Therefore, wood products in Lampung Province has a potential market.

Data on marketing activities in Lampung province, especially in West Lampung District, was collected from the wood market which was run traditionally by local people having private forest land as well as customary land. Market analysis uses the concept of value chain, which is tracing product from one market actor to the next.

The study is focused on market and marketing of forest products. In addition to timber forest products, Lampung province also produces non-timber forest products that is *Shorea spp.* resin. However, the focus of this study is basic price of wood commodity. Wood species in the wood market is divided into two groups, namely: 1) *Shorea spp.* wood known as a Premium Wood Class, and 2) Mixed Wood, consisting of various species of wood except *Shorea spp*. Wood traded in wood market is classified: 1) Round wood, 2) square logs, and 3) Sawn timber of various sizes such as planks and rafters.

There are five main market actors involved in the wood marketing chain. They are:

a. Farmer/wood producer

   Farmer/Wood producer is the first marketing chain. Farmers plant wood on HTR land or on private land.

b. Collector merchant/middleman/chainsaw owner

Collector merchant is the first to buy wood from farmer/producer. Collector merchant is also called middlemen. In some places, they are also called *tengkulak* (middleman). They usually have chainsaw since they buy wood from farmers as a standing trees. Collector does the felling, wood processing into square logs, transporting the products to the roadside, and selling wood to a wholesaler or a building depot. There are various activities done by a collector. Some collectors only fell trees without any further processing. After logs are produced, they will bring the logs to sawmill for processing logs into sawn timber.

c. Sawmill owner

Is the owner of a large scale sawmill who buys logs from wood collector. After wood is processed into square logs, sawmill operators sell it to the next wood marketing chain outside the district or even the provincial area. A sawmill owner usually has a high capital. To obtain a steady supply of wood raw material, they usually have assistants who observe the timber stock in the villages. Therefore, sawmill owner usually collector merchants besides independent collectors, not associated with sawmill.

d. *Panglong* (depot for construction wood)

Owner of *panglong* or depot for construction wood is a wood merchant who are in contact with the supplier of sawntimber and sell it to the end users. *Panglong* owners can be classified into a district and a provincial level.

e. Consumers

Is the final actor in the wood marketing chain, who uses the wood in the form of sawn timber.

Furthermore, there are four models of community produced wood marketing channel, starting from the farmer who plant the tree to the end users at the household level. The four models of wood market channel are illustrated in Figure 4.

- Wood producer/farmer →household consumers
- Wood producer/farmer →collector/chainsaw owner → consumer
- Wood producer/farmer →collector/chainsaw owner →sawmill → *panglong* (depot) → consumer
- Wood producer/farmer →collector/chainsaw owner → *panglong* (depot) → consumer

Wood sales from farmers to merchants are done through various ways. Among others are:

1) Farmers offer trees directly to middlemen or sawmill owner. Information given is tree location of trees, quantity, species and tree age.

2) Middlemen merchants, who has their own capital or work for sawmill owner. They will observe or do a survey to the location and to assess/to invent the wood volume. Based on this assessment, bargaining process on price will be done.

4.2.2. Margin distribution analysis

To identify the benefit distribution received by each business actors, the mechanism will be described starting from the cost analysis of *Paraserianthes falcataria* stand development or other fast growing species to the determination of sale price of product.

a. Market Price of Round Wood

Planting pattern is done in monoculture. The initial number of seedlings to be planted is between 600 – 800 seedlings with the assumption that at least 400 of the planted seedlings will survive until the end of planting cycle (harvested at the 8th year). Based on market survey and interviews by using FGD method between HTR farmers and wood merchants, market price of standing tree of *Paraserianthes falcataria* wood for each m^3 is Rp 200,000. Based on farmer's experience in the field and supported by study results (Andayani, 2008; Putra, 2006; Sitanggang, 2009), *Paraserianthes falcataria* trees of 8 years old has reached an average diameter of 37.6 cm with height of free of branches bole of 10 m. Therefore, the average wood volume of *Paraserianthes falcataria* bole is around 0.78 m3/stem. With a number of 400 trees per hectare at the end of the planting cycle, wood volume expected from each hectare of plantation is 312 m3. Based on an average increment of 25 m3/ha/year, wood volume per hectare of *Paraserianthes falcataria* at the age of 8 years is thus 200 m3. For calculation of a minimum base price, wood volume of 200 m3 per hectare is used.

b. Marketing Cost Analysis

Marketing cost expended by each business actor includes chainsaw cost (felling and bucking), transportation cost (from forest to market, cost for loading and unloading), administration cost, and other costs. Table 9 shows the recapitulation of marketing cost based on marketing pattern prevailing in Lampung Province.

Table 9. Marketing cost per m³ of *Paraserianthes falcataria* roundwood in Lampung Province

No	Type of Cost	Marketing Cost (Rp/m³)
1	Fee for chainsaw man (felling – bucking)	400,000
2	Transport to log deck (manpower)	10,000
3	Transport by truck	50,000
4	Load - unload (manpower)	30,000
5	Administrative cost (permit, retribution, tax, and others)	1,000
	Total	500,000

c. Profit and margin distribution

In value chain analysis, profit and margin is differentiated. Profit is benefit for each market actor by calculating all costs expended. In other words, profit is obtained from deducting total income with total cost expended by each market actor. Meanwhile, margin distribution in the value chain is obtained from the difference of benefit received by one market actor with another market actor in the previous market chain.

Table 10 shows the profit and margin distribution in the wood value chain in Lampung Province. The result of data analysis was obtained by tracing the value chain distribution in the field. There were three market actors identified: tree owner/farmer, collector merchant and end user. Trees sold by farmer did not originate from HTR activity, but growing among *Shorea javanica* trees. The trees grew from natural regeneration, without any intensive tending. *Shorea javanica* farmers were more focused on tending *Shorea javanica* trees and its resin. In other words, the fast growing tree species grew naturally. This was being confirmed by the farmer owning the trees that the trees grew without spending any cost invested on it. This assumption is used in the analysis of value chain, where farmers did not spend any cost in the wood production.

Table 10. Profit and margin distribution in wood value chain in Lampung Province

Market actor	Cost			Revenues	Profits		'Margins'	
	Total cost	Additiona l cost	%	Unit price	Unit	%	Unit	%
Petani kayu rakyat	0	0	0%	200,000	200,000	80%	200,000	27%
Wood buyer	700,000	500,000	100%	750,000	50,000	20%	550,000	73%
Total		500,000	100%		250,000	100	750,000	100%

Based on data on Table 9, margin distribution between wood buyer and tree owner/farmer is not equally distributed (27% and 73%). This proportion shows that highest margin is received by buyer. However, this margin distribution does not take into consideration the cost expended by market actors. If cost of production component is taken into consideration, profit received by wood buyers is Rp 50,000/m3 (20%) and farmers Rp 200,000 (80%). Data collected from the field shows that the value chain in the community wood market in Lampung province is not as what should be.

Lesson learned from the case is that community wood market has no standard price. Profit distribution to buyer which is Rp 50, 000/m3 should not be assumed as a small value. Rather, it should be understood that the profit is received by buyer in a relatively shorter time than that spent by farmer to plant trees. Furthermore, the profit per transaction of wood purchase can reach minimum of Rp 250,000 or 5 m3 of wood per transaction (data from an interview). Meanwhile, profit of tree owner which is Rp 200,000/m3 is received in the time scale of the tree life cycle or more than five years.

Market condition and wood price which has no standard is one of the reasons why community plantation forest has not developed as expected. In Lampung Province in particular, farmers are not interested in planting timber rather they prefer to invest in agricultural produce e.g. rubber, oil palm, and coffee. Investment in crop commodities is more promising in terms of continuous income, shorter period of time, and easier marketing of produce. Meanwhile, although timber has a high price, there is no standard yet for timber price. This is the reason why timber plantation has not become a reliable business as a source of family income.

To encourage the business of community wood, a study is needed on the base price of wood. The next sub-chapter will explain some methods in determining base price of wood, by assuming that the wood is produced from community-based plantation fforest (HTR).

4.3. Analysis on Determination of HTR Wood Base Price

The determination of HTR wood base price can use one of the approaches, which are market price, stumpage price, and social price (Irawati et al. 2008).

4.3.1. Market Price

Market price is the price formed through market mechanism. The price is from bargaining process between consumers and producers who meet at the wood market. Wood

market price is determined by wood species and product specification. In Lampung province, wood species in the market is classified into two groups, namely *Shorea spp.* and non *Shorea spp.* or *racuk* (a local name). *Racuk* is classified into two groups based on the quality. Premium (a high) quality *racuk* are e.g. *Piper ningrum, Vitex pubescen, Cinnamomum spp.,* and *Michelia spp.* woods and non-class (a low quality) *racuk* are e.g. *Alstonia spp.* and *Anthocephalus cadamba* wood. Tabel 11 shows the market price of various species and wood products at study sites.

Table 11. Market price of wood in West Lampung District

No	Product Specifi-cation	Size	Price (Rp)/m3		
			Shorea spp	Premium *Racuk*	Non-class *Racuk*
1.	Planks	2/4 m x 25 cm x 2 cm	1,700,000	1,400,000	1,200,000 – 1,300,000
		2/4 m x 25 cm x 4 cm	2,000,000	1,400,000	1,200,000 – 1,300,000
2.	Squares	Various (3x3, 3x6, 4x6, 5x7, 7x14)	1,600,000– 2,000,000	750,000 – 800,000	500,000 – 700,000

Explanation: price at merchants = price at end user

Market price at a farmer level is evaluated based on tree measurement, species, and location of the standing tree. Based on the interviews with farmers, price of tree received by farmers is around Rp 100,000 for non *Shorea spp.* tree or *racuk* while for *Shorea spp.,* the price is around Rp 500,000. For *racuk* species, the price applies for trees with an estimated volume of 0.5 m^3. Therefore, price per m^3 at a farmer level is Rp 200,000, excluding harvesting and processing costs.

4.3.2. Stumpage price

Stumpage price is the price that reflects the value of stand. The price received by HTR farmer should cover all costs expended in producing wood and there should be profit from his venture. Therefore, stumpage price is calculated from the accumulation of costs expended, profit and risk. Table 12 shows the results of analysis of stumpage price for fast growing species of community wood.

Table 12. The Calculation of stumpage price

No.	Cost Component	Total (Rupiah)
1	Cost of production	9,105,000
	Plantation life cycle (year)	8
	Bank interest rate per year (%)	10
2	Value of stand on 8th year	19,517,376
	Production (m3/ha)	200
3	Value of stand (m3/ha)	97,578
	Profit	14,638
	Risk	9,759
4.	Value of stand after profit	112,225
5	Value of stand after profit + risk	121,984
Stand Value		**121,984**

Based on above calculation the stumpage price is Rp 121,984.

4.3.3. Parity/Social Price

Parity/Social price is the price that gives the best allocation of the resource and therefore will give the highest level of profit. Social price is calculated on the basis of the base price of opportunity cost, which is the most profitable alternative of wood produced from HTR and using the parity price approach. The social price of wood is derived from wood price at the international level, where social price of wholesalers and wood processing industries which is the closest price with that at a farmer level is equal to international price after the adjustment to the exchange rate, transportation cost, processing cost, and domestic marketing (Irawati et al., 2008).

Community wood is sold to factory that will further process it into export commodity. Therefore, social price is calculated based on the sale price at the factory door where wood is processed. Parity price of *Paraserianthes falcataria* wood in Lampung province is around Rp 225,000 to Rp 240,000 per m3 (Table 13).

Table 13. Calculation of parity/social price of *Paraserianthes falcataria* wood

No.	Cost Types	(Rp/m3)
1	**Price of Roundwood at factory door**	**700,000-750,000**
2	**Total Cost**	**500,000**
	Wage of chainsaw man (felling – bucking)	400,000
	Transport to log deck (cattle or man)	10,000

No.	Cost Types	(Rp/m3)
	Truck transport	50,000
	Load - unload (manpower)	30,000
	Administrative cost (permit, retribution, tax, and others)	10,000
3	*Paraserianthes falcataria* Roundwood Parity Price	**200,000-250,000**

Analysis for determining wood base price using three approaches (market price, stumpage price, and parity price) gives different standard price. Analysis of stumpage price resulted in a figure of Rp 121,984 per m^3, market price resulted in a figure of Rp 200,000/m^3, while using analysis of parity price resulted in a figure between Rp 200,000 and Rp 250,000 per m^3.

To determine standard price for wood produced from HTR, the parity/social price can be used as standard price. By using social price as a standard price, farmers receive a maximum profit from HTR business. Thus, HTR farmers are encouraged and motivated in HTR management because they receive a high profit. This condition will accelerate the HTR development and enhance the economy of communities living around forest areas.

Besides fast growing species i.e. *Paraserinathes falcataria* and *Anthocephalus* cadamba, many other species are also planted in Lampung province. They are *Michelia spp.*, and *Shorea* family, in particular *Shorea javanica*. Table 14 shows the result of analysis of market price of these wood species in year 2013.

Table 14. Market price of wood (Rp/m^3) in Lampung Province in year 2013

No	Wood species	Price of standing tree	Price of log at log deck	Wood price at factory door	Sawntimber price in market in Province
1.	*Paraserianthes falcataria*	200,000	450,000	750,000	1,000,000
2.	*Michelia spp.*	800,000	1,000,000	1,500,000	2,600,000
3	*Shorea spp.*	1,000,000	1,500,000	2,000,000	3,000.0000

4.4 Analysis on HTR Management and HTR Wood Marketing Strategies

Policy on marketing aspect of community wood is one of the aspects that government should pay attention to if HTR is expected to develop well in the future. However, HTR management also needs policy intervention to solve problems at a field level.

The study results, observation, interviews and FGDs can be used as valuable inputs for the policy formulation on HTR. Various strategies can be formulated to address the problems encountered in the HTR management in Lampung Province as described below.

4.4.1. General Strategy on HTR Management

Based on problem analysis in each HTR cooperative holders in Lampung Province, there is the need for efforts from relevant agencies, both the Technical Units of the Ministry of Forestry and the local government at provincial and district level to adopt strategies as follows:

1. Strengthening Cooperative Institution

To develop and to enhance the capacity of cooperative and community groups through:
   - reorganization of cooperative management
   - formulation of work plan at cooperative level
   - improvement of business institution
   - strengthening working capital of cooperative.

2. Facilitation

The enhancement of facilitators' capacity and the improvement of facilitators' duty and responsibilities in the field are needed. The technical unit of DG of Forest Utilization (BP2HP) should develop criteria and indicators of duties and responsibilities of facilitators and reporting system. This is to facilitate the performance evaluation system and incentive provision for facilitators. Lessons learned from the BUTSI progranme around the year 1969 showed that HTR facilitators can be recruited from new university graduates of forestry or agriculture. Facilitators are advised to stay at the location where they work, be involved in HTR development, and be enganged in communities' everyday lives. They are provided with incentive in the form of a piece of land. The land can be used as an example for the community being assisted in terms of good HTR land management.

3. Strengthening the capacity of HTR farmers.

In some HTR cooperative holders, cooperative members are not actively involved in HTR management. All land management activities is left entirely to the cooperative board. This condition is certainly not in line with the original purpose of HTR programme which is to enhance community participation in forest management. Thus, strengthening the capacity of farmers is important to be done through intensive extension and facilitation.

The capacity building strategy for HTR famers suggests that the role of the Agency for Human Resources Development and Forestry Extension becomes very important. The process of forestry extension and farmer capacity building of smallholder plantations has become the priority. However, the process is still underway. At the field level, strong cooperation and coordination still needs to be maintained. Coordination between Technical Unit of DG of Forest Utilization (BP2HP), Forest Service, Department of Cooperatives, Extension Board, Department of Industry, and Regional Development Planning Board should not be just a slogan, instead it must be realized in concrete programmes to enhance the capacity of the communities as professional business communities in forest plantations.

4.4.2. Policy in Determining Base Price of HTR Wood Products

In connection with the lack of incentive in relation to standard price of timber produced by local people, government policy is required to enhance farmers' interest in doing HTR business. For the reason, the efforts to develop community produced timber market are done by opening market channel. This is an opportunity to increase market price of timber. It can be done among others by opening up channels of wood exports. These efforts will increase the demand for community produced wood. Strong demand will drive the market into a perfect competitive structure. Thus, farmers who produce good quality wood will get a fair price based on the balance point of supply and demand.

Learning from the management of community forests in Java, many authors state that the development of community forests in Java is driven by timber market. Similar experiences occur in various parts of the world. Zhang and Owiredu (2007) reported that wood price is a driving force for the development of community timber plants in Ghana. High demand, but limited supply of wood and timber from natural forests has encouraged the development of plantation forests including community teak forest plantations in Laos (Midgley et al., 2007). Similarly in the Philippines, the development of community timber plantations is fueled by the rising demand for timber and profitable timber price (Bertomeu, 2006).

In a developed country such as Japan, to attract farmers to become timber plant growers, government subsidy is sometimes still necessary (Ota, 2001). The forms of subsidy required to develop community timber plantation business include the partnership between farmers and wood-processing industries. For this purpose, it is necessary to review policy in partnership mechanism between entrepreneurs and HTR cooperative holders. The scope of activities of a partnership may include crop production activities to product marketing. The

principles of partnership are the implementation of work norms and standards, so the partnership works with the principle of equality, open and non-binding, market-oriented, the improvement of forest land productivity orientation, respecting the functions and roles of each party, willingness to grow and move forward together, as well as the competency to solve problems by consensus. Partnership principle that should be implemented in wood marketing activities is a balance of information and bargaining power between farmers and industries. Thus, the partnership will provide a fair price for both parties.

To achieve an equal partnership, HTR farmers need to have information on price and timber market. Similarly, in a perfect competitive market condition, forest farmers are expected to have adequate capacity as entrepreneurs of forest plantations. For this purpose, the capacity building of farmers as forest plantation entrepreneurs need to be seriously considered.

Policy formulation on base price of HTR timber sale suggested by Irawati et al. (2008) can be considered, i.e. the selling price of HTR timber must be able to cover all costs of timber production at a farm level. In addition, farmers should receive a reasonable profit from their business. There are several factors for the government policy intervention to determine base price of wood produced by communities. They are:

1. Bargaining position of farmers in determining the price is weak. Farmers agree with the price determined by traders because farmers in an urgent situation to get money.

2. There is a difference of wood volume determination between the calculation done by farmers and by traders (30-40%). The reason is that traders measure the top diameter which is the smallest. Therefore, the price paid to the farmers is minimal. The Government may determine the base price with an allowance of 30-40% of the market price. Irawati et al. (2008) explains that the market price is the price that occurs in the field or actual price and the government can not intervene further once the market price has been established. Therefore, the base price is derived from the current market price with an allowance of 30-40%. The results of the calculation of the base price are shown in Table 15.

Table 15. The determination of base price of some wood species

No	Base price based on location	Market Price (Rp/m3)	Base Price (Rp/m3)
1	*Paraserianthes falcataria*		
	- As standing tree	200,000	260,000 -280,000
	- At Log Deck in forest road	450,000	585,000 – 630,000
	- At factory door	750,000	975,000 – 1,050,000

No	Base price based on location	Market Price (Rp/m3)	Base Price (Rp/m3)
2	*Michelia spp.*		
	- As standing tree	800,000	1,040,000 – 1,120,000
	- At Log Deck in forest road	1,000,000	1,300,000 – 1,400,000
	- At factory door	1,500,000	1,950,000 – 2,100,000
3	*Shorea spp.*		
	- As standing tree	1,000,000	1,300,000 – 1,400,000
	- At Log Deck in forest road	1,500,000	1,950,000 – 2,100,000
	- At factory door	2,000,000	2,600,000 – 2,800,000

(data source: primary data collection)

The price established from the results of this analysis indicates that the base price value is closer to the value of social / parity price. Therefore, in determining the base price, the government can use two alternative approaches, namely 1) social / parity price, and 2) current market price with an additional value of 30-40%.

Through the determination of base price, HTR farmers are expected to be more motivated to do HTR business because of a reasonable profit. Furthermore, the HTR programme will be successful in enhancing people's economy in accordance with the principles of development which are *pro-poor*, *pro-growth, pro-jobs,* and *pro-environment.*

V. CONCLUSION AND RECOMMENDATION

5.1. Conclusion

1) The result of financial analysis for HTR business in Lampung Province shows that HTR business is feasible. Parameter values as the result of data collection are: NPV: Rp 9,911, 550; BCR: 2.13 and IRR: 19%.

2) There are four marketing pattern for *Paraserianthes falcataria* round logs in Lampung Province, which are:

   - Farmer ➔collector/chainsaw owner ➔sawmill ➔ *panglong* (depot) ➔ consumer
   - Farmer ➔ collector/chainsaw owner ➔ *panglong* (depot) ➔ consumer
   - Farmer ➔ collector/chainsaw owner ➔ consumer
   - Farmer ➔ consumer

   The chain of timber market has not benefited the farmers as log producers due to a low bargaining power. Farmers as price takers receive a minimal margin, which is 27% while traders receive 73%.

3) The calculation of *Paraserianthes falcataria* wood price using stumpage price, market price and social/parity price methods gives the following results:

   - Stumpage price is Rp 121,984/m3
   - Market price is Rp 200,000/m3
   - Social/parity price is Rp 200,000-250,000/m3

   The values are received by farmers in the form of standing trees in the forest. In determining standard price, value ranges between market price and social/parity price can be used.

4) The constraints of the HTR programme in Lampung Province is the discontinuation of partnership. In four out of six cooperatives, HTR activities do not continue after the

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HTR license has been issued. The relationship between farmers and cooperative management was stagnant and need support if HTR activities were to continue. Therefore, the strategies for HTR development in Lampung province are: 1) institutional strengthening of cooperative, 2) facilitation, 3) increasing capacity of farmers.

5.2 Recommendation

By learning the progress of HTR programme in Lampung Province, there are several suggestions for the development of HTR. They are:

1. The Ministry of Forestry through the Technical Unit (BP2HP) collaborates with the Cooperative District Office to support the institutional strengthening of HTR Cooperative by reorganization of cooperative management, the preparation of work plan, institutional reform efforts, and strengthening cooperative working capital through BLU P2HT loan.

2. To enhance the capacity of facilitators and to improve the work of facilitators, BP2HP needs to develop criteria and indicators of the duties and responsibilities of facilitators as well as reporting system.

3. There is a need for coordination between the Directorate General (DG) of Forest Utilization and Human Resource Development Agency and Forestry Extension, as well as other relevant agencies to strengthen the capacity of farmers into professional HTR plantation entrepreneurs. Education and training are done with comprehensive material on business management of forest plantations, ranging from silvicultural techniques to timber market information. BP2HP facilitates the partnership between farmers and wood-processing industries.

4. Base price of HTR timber sales in Lampung Province should be established through government policy intervention. This policy is needed as the government concern to farmers while maintaining a fair margin distribution among market actors. The determination of standard price can refer to social or parity price. In pratice, market price can also be used with an additional value of 30-40% of the market price.

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Appendix 1. List of respondents of HTR cooperative management and members

No	Name	Remarks
1	Lukman	Cooperative Member of Bina Hutan Utara
2	Arpandi HS	Cooperative Member of Bina Hutan Utara
3	Mista Yamisata	Cooperative Member of Bina Hutan Utara
4	Joni Aspiyani	Cooperative Member of Bina Hutan Utara
5	Aria Effendi	Cooperative Member of Bina Hutan Utara
6	Susroharni	Cooperative Member of Bina Hutan Utara
7	Agus Ricardo	Cooperative Member of Bina Hutan Utara
8	Darul Hak	Cooperative Member of Bina Hutan Utara
9	Yudi Ardianto	Cooperative Member of Bina Hutan Utara
10	Ahmat Jauhari	Cooperative Member of Bina Hutan Utara
11	Makmur Banas	Cooperative Member of Bina Hutan Utara
12	Nursiwan	Cooperative Member of Bina Hutan Utara
13	Amirudin	Cooperative Member of Bina Hutan Utara
14	Efendi Lubis	Cooperative Leader of Bina Hutan Utara
15	Izhar Rahman	Cooperative Member of Bina Hutan Utara
16	Rohidi	Cooperative Member of Bina Hutan Utara
17	Sarwono	Cooperative Member of Bina Hutan Utara
18	Yonesta	Cooperative Member of Bina Hutan Utara
19	Hari Yanto	Cooperative Member of Bina Hutan Utara
20	Sofi Amaludin	Cooperative Leader of Jaya Bersama
21	Imron	Cooperative Treasurer of Jaya Bersama
22	Nur	Cooperative Secretary of Jaya Bersama
23	Prabawa	Cooperative Lambar Subur Rezeki
24	Mulyono	Cooperative Lambar Subur Rezeki
25	Edwin	Cooperative Lambar Subur Rezeki
26	Ilham	Cooperative Secretary of Unggul Jaya
27	Ahmad	Cooperative Unggul Jaya
28	Peratin	Cooperative Unggul Jaya
29	Rizki	Cooperative Unggul Jaya
30	Nugraha	Cooperative Labuwai Lestari
31	Joko	Cooperative Labuwai Lestari
32	Alifin Nur	Cooperative Labuwai Lestari
33	Bambang	Cooperative Labuwai Lestari
34	Baskoro	Cooperative Labuwai Lestari
35	Jatmiko	Cooperative Sinar Selatan
36	Dedi	Cooperative Sinar Selatan
37	Agus Komara	Cooperative Sinar Selatan
38	Wahyu	Cooperative Sinar Selatan
39	Komar	Cooperative Sinar Selatan
40	Yayat	Cooperative Sinar Selatan
41	Subandi	Cooperative Sinar Selatan
42	Cepi	Cooperative Sinar Selatan

No	Name	Remarks
43	Rustam	Cooperative Sinar Selatan
44	Andi	Cooperative Sinar Selatan
45	Yusef	Cooperative Sinar Selatan
46	Marzuki	Cooperative Sinar Selatan
47	Subowo	Cooperative Sinar Selatan
48	Budi	Cooperative Sinar Selatan
49	Ahmad	Cooperative Sinar Selatan
50	Rudianto	Cooperative Sinar Selatan

Appendix 2. List of informants (market actors)

No	Informant Group	No	Name of Informant
I	Tree Grower	1	Najili
		2	Mulyandri
		3	Yusef
II	Chainsaw Owner	1	Ediansah
		2	Tobing
		3	Joni
III	Merchant collector, sawmill supplier	1	John
		2	Win
IV	Sawmill	1	Cikwan
		2	Julius
		3	Haji Nizar
V	*Panglong* (wood depot)		
	-Panglong at District level	1	Peratin Mulyadi
		2	Khoirul Effendi
	-Panglong inter District/Province	3	Edi Qoiri
	-Panglong City Province	4	Taufiq
VI	Wood Processing	1	Merah Efendi
		2	Maman
		3	Ujang
	Total	18 persons	

APPENDIX 3. List of questions

Respondents: HTR Farmers

No		Purpose/ Inquiry point	Remarks
I		**Financial analysis of HTR activities**	
	1.	Costs needed for planting establishment - Land preparation - Land clearing - Seedling preparation - Planting hole digging - Planting - Tending - Pest and disease control - Harvesting	
	2.	Sale of HTR Products - Wood (species, volume, harvesting span period, price) - Non wood (type, volume, harvesting span period, price)	
II.		**Anlysis of Market Channel**	
	1.	To whom is HTR products sold?	
	2.	Is there any alternative to sell to others?	Social cultural aspects in marketing HTR products
	3.	Reason to sell to certain party (because of highest price, good relationship, or because of other reasons?)	
	4.	How does negotiation process occur?	
	5.	How is the mechanism of payment done (cash at the time product is harvested, postponed until wood is sold to next merchant or *ijon*)* system?)	
	6.	Is the price at the transaction satisfactory?	
	7.	Is there any other marketing mechanism that has the potential of increasing profit / income of farmers?	
III.		**Analysis of standard price of HTR Products**	
	1.	How is the perception of farmers on current wood price? (too cheap or reasonable)	
	2.	If price is too low, what is the reason (weak bargaining power of farmers, no information on standard price, or there is no other choices when the need for cash is urgent)?	
	3.	If price is too cheap, what is the reasonable price according to farmers' perception?	
		*) selling as standing tree before harvesting time	

IV		Analysis on Marketing Strategy of HTR Products	
	1.	How is the experience of farmers in requesting HTR license (from where was the first information on HTR was received, who supported the process of license application, how is license processed, and others)?	
	2.	How is the response/opinion of farmers after becoming a HTR license holder (what is the benefit felt as a HTR license holder)?	
	3.	What problems are faced as HTR license holder? - Problems in permit processing - Problems in cultivation technology - Problems in financial capital - Problems in marketing, and others	
	4.	What is farmers' expectation in order for HTR business to be more developed?	
	5.	Is there any proposal/suggestion/solution from farmers on problems faced?	

Respondent: Merchants (collectors, wholesalers, and others in market chain of HTR Products)

Method used is snowball sampling, where respondents to whom farmers sell their HTR products are selected based on initial information of HTR farmers

No		Purpose/ Inquiry Point	Remarks
I.		**Market Channel Analysis**	
	1.	Source of wood bought	
	2.	Volume of wood bought every month (on average)	
	3.	What is the base price of wood bought from farmers? Rp/m3 or Rp/stem?	
	4.	What standard is used in determining purchase price of wood from farmers (species, location, quality, volume?). Please explain	
	5.	How does negotiaton occur?	
	6.	How is the price mechanism done (cash at time product is harvested, postponed until wood is sold to subsequent buyer, or *ijon**) system?	
	7.	How is felling process done? -how much is the cost expended? -how is felling permit processed (cost spent for permit)?	

	8.	What processing on tree trunk is done by intermediary merchants?
		    I. What is the specification of the products (sawntimer, square logs, and others)?
		    II. How much cost must be expended to convert logs into sawntimber?
		    III. What is the yield?	

	9.	Where is the market destination of the processed wood? What is the sales price? How much is the margin received?	
	10	Are they satisfied with the price they receive from the transaction?	
II.		**Base Price Analysis of HTR products**	
	1.	What is the perception of middlemen on standard price of tree bought from farmers (too cheap, fair, too high) What are the reasons?	
	2.	How is the perception of middlemen on standard price of processed wood/sawntimber which they sell to the next trader? (too cheap, fair, too high?) What are the reasons?	
III.		**Analysis on marketing strategy of HTR products**	

Respondents: Regional Forestry Office, Technical Unit (UPT) of DG of Forest Utilization of the Ministry of Forestry (BP2HP)

No		Purpose/ Inquiry Point	Remarks
I.		**Market Analysis**	
	1.	Data base related to HTR areas (allocated HTR areas, HTR definitive areas, license holder, and others)	
	2.	Secondary data on wood processing industries	
	3.	Secondary data on community wood felling	
	4.	Regulation related to trade of community wood	
II.		**Strategy analysis on HTR products**	
	1.	Perception of local government related to HTR programme	
	2.	Problems, constraints or obstacles in implementation of HTR programme	
	3.	How is the function of regional office in the development of HTR programmes (what programmes have been or will be done)?	
	4.	What are suggestions and recommendations of local government to develop HTR programme	

Appendix 4. Pictures of activities

Interviews with farmer as the owner of community wood

Interviews with middleman/collector trader/ chainsaw owner

Interview with sawmill owner

Sawmill

Interview with *panglong* (wood depot) owner in the district

Panglong (wood depot) owner at District level

Interview with the Head of District Forestry Office and staff in West Lampung

Interview and secondary data collection at Provincial Forestry Office in Bandar Lampung

Interview and wood marketing data collection at the Provincial Forestry Office in Bandar Lampung

Data collection at District Forestry Office in West Lampung