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

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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"

PROJECT TECHNICAL REPORT

Economic Study and Standard Price of Community-Based Plantation Forest (HTR) Products

Case Study in North Minahasa Province

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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

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Project Coordinator: Dr. Anna Indria Witasari

EXECUTIVE SUMMARY

Marketing and standard price of Community-Based Plantation Forest (HTR) products aspect is necessary to know in order to attain sustainability of community plantation business. Therefore, a government policy to protect and preserve the forest community business is required. This study is intended to determine the feasibility of standard price, marketing efficiency and financial feasibility analysis of HTR products in North Sulawesi Province.

The study was conducted from January to April 2013 in three districts of North Sulawesi Province. This study is based on both primary and secondary data. Primary data and information were collected from farm households, local wood traders, developers and key informants through interviews and Focus Group Discussions (FGDs).

To determine the feasibility of standard price of HTR products, three approaches were made i.e: (1) market price, (2) stumpage price, and (3) parity/social price. The marketing efficiency parameters used in this research were: (1) profit margin, (2) marketing margin, and (3) mark up analysis (i.e: mark up on sales). Financial feasibility analysis are based on three investment criteria such as net present value NPV), benefit-cost ratio (BCR), and internal rate of return (IRR).

The result of the financial analysis from HTR in North Sulawesi Province shows that in term of all three investment criteria it is feasible. Meanwhile, market distribution system of HTR products is not efficient yet according to profit *margin, marketing margin, and mark up on selling parameters. Profit margin value for local trader is 27% (Rp 135,000/m3), middleman around 23% (Rp 110,000/m3), and farmer/producer around 13% (Rp 55,000/m3). The least is the provincial trader which is around 5% (Rp 25,000/m3). Average marketing margin value by local traders is around 70% (Rp 350,000/m3), middlemen around 68% (Rp 320,000/m3), and farmers/producers of around 65% (Rp. 280,000/m3). The least is provincial traders with around 14% (Rp 75,000/m3). Marketing condition for HTR timber products is imperfect and there is a tendency toward oligopolistic condition.*

Findings of this study indicate that there is a prospect to construct new entrepreneur in forestry sector through HTR programmes by taking into account the standard price of HTR produced logs at an industry gate by government policy intervention amounting to *Rp* 650,000 to 700,000 for Paraserianthes falcataria*; Rp* 910,000 to 980,000 for Gmelina; and Rp 2,600,000 to 2,800,000 for Elmerrillia spp.

Keywords: HTR, standard price, marketing efficiency, financial analysis

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I. INTRODUCTION

A. Background

Community-based Plantation Forest (HTR) development is regulated by Government Regulation (PP) No. 6 of 2007 in conjunction with PP. No. 3 of 2008 regarding Forest Administration, Forest Management Planning, and Forest Utilization as well as Joint Regulation between the Minister of Finance and the Minister of Forestry No. 06.1/PMK.01/2007 and SKB 2/Menhut-II/2007 regarding Afforestation Fund Management in the Forest Development Account. After issuing the decree, the Ministry of Forestry allocated designated production forest which was unproductive (5.4 million ha) as HTR areas. The areas are expected to be managed by at least 360,000 households living around it, assuming each household to manage up to 15 ha.

The essence of HTR programme is plantations which are planted by community groups to improve the potential and the quality of production forest by applying silvicultural techniques that ensure forest resource sustainability. This is in accordance with the principles of pro-poor, pro-growth, and pro-jobs and pro-environment development.

The Ministry of Forestry has made various efforts to accelerate the HTR implementation in the field such as formulating legal base, supporting license approval, and providing financial support. In addition, conducting socialization intensively, simplifying bureaucracy procedures, proactive efforts, encouraging the involvement of various agencies, minimizing transaction costs, and establishing institutions for distributing loan. The agency is called the Forest Development Funding Centre (P2H Centre). P2H centre is a work force unit of the Ministry of Forestry which applies a pattern of financial management for public service (PPK-BLU) for financing forest development. The P2H centre is a part of the Secretariat General of the Ministry of Forestry. This indicates the concern of the Ministry of Forestry to facilitate local communities as acknowledged new agencies for business entities working towards sustainable forest management on state lands.

Thus the HTR programme is a form of policy innovation in management practices within production forests. It can be regarded as an innovation because HTR programme could be seen as something new, meaning that there is no such programme prior to HTR programme. The

novelty can be seen in aspects of management entitlement to local communities to manage production forest (state forest) that did not previously exist. Previous approach of management of production forests was only given to companies either private such as *HPH* (Forest Concession Holders) and *HTI* (Plantation Forest Holders) or State Forest Enterprises such as *Perhutani* and *Inhutani*. Given the HTR programme, suggestions and criticism from various agencies which suggest that local people are also capable of sustainable forest management practices can be accommodated. But the question is whether such assumption is true. The question will be answered after one rotation of fast growing tree species, eight years later.

Issues that could potentially be an obstacle in the development of smallholder plantations are aspects of feasibility and marketing of HTR products. Farmers are rational individuals, meaning that farmers choice for timber investment business is determined by how much benefits of the effort they will acquire. The research results of Darusman and Hardjanto (2006); Lubis (2010), as well as Sitanggang (2009) found out that business of planting trees for timber products for communities is in general only as an additional instead main source of income. This indicated that efforts in plantation establishment have not attracted farmers yet. In other words, plantation business has not become a major household income.

The condition raises questions about HTR feasibility. Therefore, feasibility analysis of Forest Plantation activities becomes important to study. Besides HTR financial feasibility, a review of the more macro aspects of the marketing of the HTR products should also be included. HTR production marketing study includes the potential for timber and non-timber markets from HTR, marketing channel of timber and non-timber products from the tree growing farmers to industries, as well as the distribution of profits from each market actors along the market chain. Aspects of business analysis will ultimately determine the standard price for HTR wood products. Determining the standard price for HTR products is expected to be one of the policies that can be a driving force for HTR development in Indonesia.

The study was conducted in the province of North Sulawesi which has an allocated HTR area of 48,140 hectares. Applied scheme/pattern is a Developer scheme. North Sulawesi province is declared as one example of a successful HTR development implementing a Developer scheme. This is reflected in the data of actual credit agreement in July 2010. HTR amount of the loan agreement which has as many as 24 HTR involving 321 households with HTR license. It covers

total area of 3,960 hectares, which spread over 3 districts. The amount of the credit platform is Rp 21,995,238,200 (Rahmadi, 2013).

Research activities related to issues of community timber enterprises have been carried out. However, financial analysis performed on the implementation of HTR programme has not much been done. Thus, this study has significance to complement the aspects that have not been studied. Besides, aspect of marketing becomes very important to be studied to provide the right information to the government and farmers/producers. The expected outcome is that effective and equitable functioning of market mechanism for all actors involved.

B.   Problem Formulation

Good understanding of the relationships/interactions occurring in market reciprocity will allow to improve the farmers' livelihoods so their production can fulfil market opportunities. This study aims to answer some fundamental questions relating to the eligibility of HTR farm, optimal pricing of mutual benefit among actors of forest products marketing. The main problems to be answered in this study are:

a. Is HTR farming financially feasible?

b. How is the marketing channel of timber produced by small-scale farmers as well as how is the distribution margin and marketing efficiency of timber plantations?

c. How much are the minimum and optimum prices of CBPF products in order for all segments of market actors to have a reasonable profit?

d. What are the problems faced by both farmers and market actors, and what are the opportunities that can be done to improve the better market relationship for mutual benefit?

C.   Hypothesis

Hypotheses constructed in this study are:

1. HTR development efforts deserve to be the mainstay of the family business since it is financially feasible and has a market potential.

2. There is a business development opportunities for HTR and government policies are needed to regulate the standard price of HTR products as well as to facilitate in providing market opportunities for HTR farmers.

D. Goals and Objectives

Economic study and standard price of HTR are intended to provide data and information related to the acceleration of HTR development.

Objectives to be achieved from economic study and standard price of HTR are:
1. Analyzing the financial feasibility of the HTR management.
2. Inventory of HTR product marketing patterns in North Sulawesi.
3. Analyzing standard price of HTR products.
4. Identifying problems and constraints in the implementation of HTR programme in North Sulawesi.
5. Providing recommendations for policies in HTR development.

E. Outputs and Outcomes

Economic study and standard price of HTR product p will provide the following outcomes:
1. Data and information relating to the financial feasibility of HTR management.
2. Data and information relating to market and marketing system in HTR management.
3. Data and information on the standard price of forest products.
4. Data and information on HTR management conditions.
5. Policy formulation and development strategies for HTR.

Outcomes expected from this study are the emergence of forest plantation business system that is beneficial to all agencies involved in HTR development, encouraging HTR as the main source of income for HTR farmers, supporting business activities of the production and marketing of HTR industry.

F.   Scope

The scope of economic study and standard price of HTR forest products includes:

- Financial feasibility study on a household scale of HTR farmers.
- Study on the potential and product market chain of HTR products.
- Regional and economic feasibility study for the establishment of national standard for feasible price of HTR products.
- Study on socio-cultural factors that influence HTR management conditions starting from HTR performance management at a household level to product marketing.
- Analysis of government policy on the regulation of the marketing of HTR products.

II.   RESEARCH METHOD

A.   Location and Research Respondents

This scope of study is at the level of North Sulawesi province. Site selection was done intentionally (purposive sampling) by considering HTR location. HTR programme in the North Sulawesi province is implemented in three districts namely North Minahasa District (*Minut*), South Minahasa District (*Minsel*), and East Bolaang Mongondow District (*Boltim*) up to date. These three districts become the research sites as well as the population sample. In each district, a *Kelompok Tani Hutan* (KTH) or Forest Farmer Groups having been granted HTR license was selected and used as a sample or samples in this study. In Minut District, 3 out of 10 KTH was selected. They were KTH with HTR credit agreement totaling to as many as 20 HTR license holders. In South Minahasa District, 2 of 11 KTH with HTR credit agreement (note: 2 HTR which have been distributed for the loan of 12 HTR license holders), and in East Bolaang Mongondow District 1 KTH of 8 HTR holders. Thus, there were 40 HTR icense holders which were selected as the respondents.

To assess the HTR product market channel, surveys were also conducted through interviews with market actors. Respondents were selected through snowball sampling where the next respondents to whom the commodities were sold and who were often involved in the wood purchase and trade, was selected based on the information gathered from the farmers. For snowball sampling method, 8 respondents were identified as timber merchants, 5 respondents were brokers/middlemen who bought wood from communities, and 2 respondents were large traders in the city of Manado.

B.   Data Collection Technique

Data collected included primary data and secondary data on the pattern of marketing and standard price of HTR wood products. Primary data were collected by survey method, observation or interviews using a structured questionnaire and through Focus Group Discussions (FGDs) on HTR farmers and marketing actors. The four data collection techniques were done by the following:

1. Observation by conducting direct observation to the object of the research.
2. Literature study by reviewing literatures and reports from agencies associated with the research.
3. Interviews by asking questions directly to the respondents by referring to the list of questions that had been prepared in advance.
4. Focus Group Discussions (FGDs) by organizing respondents to meet together somewhere for discussion at the village hall, at the village chief's house, or at the district office. The intention was to obtain a complete, a more comprehensive, and a valid data because the data can be directly cross checked with other respondents during the discussion (data triangulation). Discussion materials were derived from the questionnaire to reach an agreement among the respondents and then used as the data to be analyzed in this study.

Primary data collection included data on HTR management costs and revenues, HTR product marketing channel data, data distribution on the margins of each marketing actor, as well as the problems faced in marketing HTR products. These data were collected through questionnaires, discussions and interviews with HTR farmers already granted HTR license, intermediary merchants, and wholesalers. Interviews were also conducted with key informants from the bureaucrats of Forest Service and other related agencies.

Secondary data was collected through literature reviews or reports from relevant agencies such as District Offices for Forestry and Agriculture, District Office for Industry and Commerce, Statistics, and others. Secondary data included general conditions of HTR management in each province, data on wood-processing industries, and non-timber potential as HTR products. Besides, it also examined the various programme or regulations related to HTR management and development in North Sulawesi province.

Table 1. Data and information to be collected

No.	Benefit of Analysis / Data of collected data	Data Source	Method of data collection
I.	Feasibility Analysis of HTR business		
	Data on expenditures and revenues from activities of HTR management at a farmer level	HTR farmers	Interview
II.	Analysis of HTR product market channel		
	Data on market channel models of HTR products	HTR farmers Traders	Interview
III.	Analysis of standard cost of HTR products		
	Data on margin and cost expended by market actors	Traders	Interview
IV.	Analysis on policy strategy and market development of HTR products		
	Secondary data relating to HTR management in each province		
	General condition of area, forest resource potential, data on allocated HTR areas (target and realization of HTR development in research location)	Director General of Forest Utilization and Regional Forestry Office	Study report
.	Related regulations: - HTR development - marketing of HTR products - industry purchasing HTR products	DG of Forest Utilization, DG of Plannology, and Regional Government	Study report
	Data and information related to market and marketing of HTR products. social, cultural, economic, and environment		

	impacts related to the existence of forest		

C. Data Analysis Technique

Data were analyzed qualitatively and quantitatively. Qualitative analysis was done to have an overview of the general and specific condition of the study site, marketing channels and marketing structure. Quantitative analysis was done to look at the feasibility of the business, the market forms by analyzing marketing margin and distribution. Meanwhile, marketing efficiency will be explored through the analysis of market organization, profit margin analysis and analysis of marketing margin.

In summary, stages of analysis and analytical models used to answer the research objectives are:

1. Cost analysis on HTR. It was intended to determine all cost components and the amount of costs expended in the production process of HTR wood products.

2. Analysis of production and value of production of HTR products. The results of this analysis were used as a reference in determining the standard cost of HTR products.

3. Financial analysis of HTR business (BCR analysis, NPV, and IRR) to determine the feasibility of HTR farming by farmers.

4. Analysis of the trade system to determine the distribution of the flow of wood from the manufacturer to the end users (to investigate which marketing patterns are the most profitable to farmers).

5. Marketing margin analysis and profit margin to identify the quantity of benefits received by each of business actors by calculating the gap of the prices starting from the producers to the end users.

6. To find out the level of efficiency of each business actors at an operational level, the mark-up on selling method was used.

1. Financial Feasibility Analysis

In order to find a comprehensive measure of whether or not a project/ investment was feasible, a wide range of index called the investment criteria was used. Each index used a discounted present value of current benefits and costs over the life of a project.

The following is the investment criteria used in the analysis of the HTR feasibility in North Sulawesi:

a. Net Present Value (NPV).

b. Benefit Cost Ratio (BCR).

c. Internal Rate of Return (IRR).

- NPV (*Net Present Value*)

NPV calculation is a practical investment appraisal to determine whether the project is profitable or not. NPV is the difference between *Present Value of the flow of Benefit* minus the *Present Value of the flow of Cost*. A profitable project is a project that provides benefits with a positive value of NPV (NPV> 0).

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

Explanation:

Bt   = Benefit at year t

Ct   = Cost at year t

t   = period of investment

i   = interest rate

Criteria:

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

If NPV = 0,   meaning break even point, where benefit received is only adequate 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 see the level of efficiency of the use of a cost. BCR is a comparison between a positive net present value and the amount of a negative net present value. A feasible and an efficient project is implemented if the value of the Net B / C> 1. It means that the benefits outweight the costs expended and the opposite applies.

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

Explanation:

Bt   = Benefit at year t
Ct   = Cost at year t
i   = existing interest rate
t   = project period
n   = project age

Criteria:

If B/C>1 = profitable
If B/C<1 = non-profitable

- *Internal Rate of Return (IRR)*

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

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

Explanation:

a. NPV_1 = NPV of the smallest positive value
b. NPV_2 = NPV of the smallest negative value

c. i_1 = Interest rate resulting in NPV with the smallest positive value
d. i_2 = Interest rate resulting in NPV with the smallest negative value

Investment Criteria:

a. If IRR > i ; meaning investment is feasible
b. If IRR = i ; meaning investment is at a break even point
c. If IRR < i ; meaning investment is not feasible

2. Marketing Analysis

To identify the level of marketing efficiency, this study used several variables which are analysis of (1) profit margin, (2) marketing margin, and (3) the level of operational efficiency by using the mark up on selling parameter (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 or MP = $\sum$ bi + $\sum$ ki
3. Operational efficiency level based on mark up on selling

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

Explanation:

Mp = Marketing margin;

Pr = price at consumer (user) level;

Pf = price at producer (farm) level;

bi = trade cost at l;

ki = profit at l;

Ski, Sbi = Part of profit received by marketing institution;

Sp = amount of price contribution received by producer

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

- Market price is the price established through market mechanisms, namely through the bargaining process between consumers with producers who meet in the HTR marketplace. HTR timber market price data at a farm level can be obtained from HTR farmers, traders at a village level and from industries that directly buy wood from farmers/ wood producers.

- Stumpage price is the level of price that reflects the value of the stand. HTR farmers naturally intend to cover all costs expended to produce the wood and expect to benefit from his efforts. Costs expended on the HTR development are all cost components, starting from seedlings, planting activities to tending cost to make trees ready for felling and selling.

- Social/parity price is the price that produces the best allocation of resources. Therefore, it produces the highest profit. Social price is calculated on the basis of the opportunity cost that is most favourable alternative for HTR wood products approached from parity price. HTR social price of wood is derived from the international market price.

D. Assumption

In financial analysis and marketing of HTR products, some basic assumptions in the calculation are needed. The assumption is expected to approach the actual condition in the field and should be appropriate and scientifically justifiable. The assumptions used are as follows:

1. HTR development cost up to the end of the cycle for *Paraserianthes falcataria* (8 years) is Rp 8,531,900/ha. It is based on the Regulation of the Head of Forest Development Funding No. P.01/P2H-1/2010 of 21 January 2010. Thus, this cost does not include the exploitation cost of *Paraserianthes falcataria* stands.

2. Eight year old *Paraserianthes falcataria* trees have an average diameter (D) of 37.6 cm and bole height (T) of 10 m. Thus, it has an average volume of 0.78 m3/tree. Tree volume is calculated by the formula : V = ¼ x 22/7 x D2 x T x 0.7

3. Based on a market survey and interviews using FGD method with farmers and HTR timber merchants, market price of *Paraserianthes falcataria* stand for each cubic meter is Rp 150,000 up to Rp 200,000.

4. The number of trees that grow up until the end of *Paraserianthes falcataria* cycle (8 years) is as many as 400 trees per hectare. This is in accordance with the minimum requirements set by the government in assessing the success of HTR.

5. Interest rate (i) used is 10 % per year.

6. HTR analysis unit used is 1 (one) hectare.

III.   GENERAL PICTURE OF HTR PROGRAMME

A.   HTR Development in North Sulawesi

HTR programme in North Sulawesi province has begun to be disseminated to the general public since 2007/2008. With an intensive socialization and guidance from various agencies, in 2009 many forest farmer groups started to be formed and were ready to apply for HTR license to the Ministry of Forestry. The following data shows the applicants of each district who submitted proposals for HTR management.

Table 2. Data on HTR requests in North Sulawesi Province

| No | District | Applicants | | |
		Number of Proposals	Area (Ha)	Total Cost (Rp)
1	North Minahasa	31	5,189.81	44,278,939,939
2	South Minahasa	39	8,222.67	70,154,998,173
3	East Bolaang Mongondow	11	2,255	19,243,700,450
4	Bolaang Mongondow	14	2,948	25,154,430,132
5	South Bolaang Mongondow	12	3,076.13	26,245,233,547
6	South East Minahasa	38	6,042.07	70,956,650,194
Total		145	27,733.68	256,033,952,435

Source: Rahmadi (2013), Kapus P2H.

Of the 145 HTR proposals, only 30 proposals were qualified to get approval. They were 11 from North Minahasa District, 18 proposals were from South Minahasa District, and one proposal was from East Bolaang Mongondow District. From the number, only 24 HTR continued to the stage of the realization of the loan agreement in 2010 as shown in Table 3.

Tabel 3. The realization of loan agreement for HTR development in North Sulawesi Province

No	District and HTR name	Loan Agreement			Remarks
		Total Permit	HTR Area (Ha)	Total Credit	
A.	**North Minahasa District**	**102**	**1,242**	**10,597,472,990**	
1	Maesaan	9	84	716,679,600	
2	Matuari	9	82	699,615,800	
3	Pengintoyan Jaya	13	124	1,057,955,600	
4	Merut	7	70	597,233,000	
5	Jaya Lestari I	10	144.6	1,233,712,740	
6	Jaya Lestari II	10	137.6	1,173,989,440	
7	Kombos Jaya	9	123.4	1,052,836,460	
8	Tanah Hutan	14	204.5	1,744,773,550	
9	Somahekai Kehage	11	160	1,365,104,000	
10	Tandeng	10	112	955,572,800	
B	**South Minahasa District**	**205**	**2,578**	**21,995,238,200**	
1	Baru Terbit	11	121	1,032,359,900	
2	Maayaan	17	159	1,356,572,100	
3	Lisiang	13	187,5	1,599,731,250	
4	Reidap	16	209,5	1,787,433,050	
5	Terus Jaya	17	249	2,124,443,100	
6	Tumawoy	19	209	1,783,167,100	
7	Maleosan	19	285	2,431,591,500	
8	Metuari Waya	18	230	1,962,337,000	
9	Tawang Lestari	20	280	2,388,932,000	Loan not distributed yet
10	Petolambot Jaya	16	240	2,047,656,000	Loan not distributed yet
11	Suka Maju	14	115	981,169,500	
12	Tambelang Renge	11	93	793,466,700	
13	Luagon	14	200	1,706,380,000	
C.	**East Bolaang Mongondow Ditrict**	**14**	**140**	**1,194,466,000**	
1	Bubungayon	14	140	1,194,466,000	
	Total A + B + C	**321**	**3,960**	**33,787,177,199**	

Source: Processed from Rahmadi (2013), Kapus P2H.

From 321 HTR license holders (debtor) who had a credit agreement in 2010 as shown in Table 3, only 277 borrowers who had been disbursed for their loan request up to January 2013. In other words, there were 44 debtors whose loan request had not been disbursed due to their resignation as KTH members and the compromise among group members had not been achieved. The following data showed the first stage of the loan disbursement up to January 2013.

Table .4. The realization of the first stage of loan disbursement up to January 2013

| No | District | Realization | | |
		Number of HTR/ Debtor	HTR Area (Ha)	Total of Stage I (Rp)
1	North Minahasa	10 / 101	1,232.10	1,000,725,918.75
2	South Minahasa*)	11 / 162	1,997.00	2,608,531,200.00
3	East Bolaang Mongondow	1 / 14	140,00	175,938,000.00
	Total	22 / 227	3,349.10	3,785,195,118.75

Source: Processed from Rahmadi (2013), Kapus P2H.

Note: *) two HTR had loan agreement but the loan had not been disbursed yet

B.   HTR Planting Pattern

Paraserianthes falcataria planting pattern in HTR areas in North Sulawesi is monoculture. When previously other tree species have grown in the areas, the trees are maintained together with *Paraserianthes falcataria* and are expected to be harvested together with *Paraserianthes falcataria* at the end of the cycle. The number of plants of *Paraserianthes falcataria* per hectare is based on the condition that a minimum of 400 plants should survive per hectare. Provisions that 400 *Paraserianthes falcataria* trees should survive per hectare is used as a success indicator at the time when an evaluation conducted by an assessor team from the BLU - P3H (Public Service Board - The Forest Development Funding Centre). With this indicator, the farmers plant *Paraserianthes falcataria* in the field with an average of 500-600 trees by considering the risk of tree mortality with the prediction that at the end of the cycle at least 400 trees will survive. Therefore, farmers plant with a spacing of 4 x 4 meters. However, in practice farmers always adjust to the field conditions, the number of trees which already exist as well as the landscape conditions. When many trees have grown there, a spacing of 3 x 4 or 3 x 4 meters is applied.

C. Evaluation Result of Phase I Plantation

The evaluation in the field is done by the BLU (Public Service Board) with a random sampling method. The selection of the location is also specified in the map as well to cross check the coordinates in the field with the coordinates on the map. The number of HTR to be selected as assessment sample was 7 HTR. The measurement of areas planted was done by tracking method using GPS (Global Positioning System). Meanwhile, the measurement of the number of trees was conducted using a systematic plot with a sampling intensity of 10% for each HTR selected. Circular plots with a radius of 17.8 meter represented a field plot of 0.1 ha. The evaluation results in the field were shown in Table 5.

Table. 5. Evaluation result of phase I of HTR plantation

No	District/HTR Name	Stage I Target		Field result		
		Area (ha)	Plantation	Area (ha)	Plantation	Plant condition
A.	North Minahasa					
1	Matuari	10.25	4,100	6.25 (61%)	3,981 (97%)	Height 15 – 50 cm Age < 1 month
2	Pangintoyan Jaya	15.5	6,200	2.45 (16%)	1,690 (28%)	Height 15 – 50 cm
3	Maesaan	10.5	4,200	3.6 (35%)	532 (13%)	Height 15 – 100 cm
4	Merut	8.75	3,500	8.08 (93%)	4,565 (131%)	Height 15 – 50 cm
B.	South Minahasa					
1	Baru Terbit	22	8,800	13 (61%)	4,059 (46.12%)	Height 30 cm– 3 m Covered by weeds
2	Reidap	48	19,200	1.3 (61%)	338 (1.76%)	Height 50 cm – 4 m covered by bushes
3	Suka Maju	28	1,200	14.3 (61%)	4,692 (41.98%)	Height 50 cm – 4 m Poor maintenance
	Average	20.43	8,171.43	7,00 (55.43%)	2,836.71 (51.27%)	

Source: Processed from Rahmadi (2013), Kapus P2H.

Based on the data in Table 5, the percentage of plant growth in the field varied between 1.76% and 131%. This suggestsed that there was a tremendous successful HTR while there was also HTR which was predicted to be unsuccessful. Overall, HTR performance in North Sulawesi

was only 51.27% in terms of the number of plants surviving and 55.43% in terms of planting area coverage in the field.

D. Major Problems in HTR Management in North Sulawesi

The real problem that is being debated in the communities about HTR development in North Sulawesi is a matter of a lack of mutual trust between HTR farmers and Developer. This is triggered by the farmers' suspicion towards Developer's transparency in its financial management. The fact is that farmers who will pay the loan to the government in the end of the tree cycle. According to the HTR farmers, only a half (50%) of the cost of HTR development in the field was allocated to the farmers by the Developer to establish HTR. On the other hands, the Developer complained that farmers did not take into account other costs that had been expended by the Developer. Interviews with the Developer suggested that HTR development in the North Sulawesi at the early stage required additional costs. These costs are not necessarily included in the cost components of total as Rp 8,531,900/Ha. Unexpected costs were such as paperwork and processing costs, transportation and other farmer cost – funded by Developer. It included the administration cost for ID Card and opening an account at the Bank for each debtor. In addition, the Developer had also spent money during the preparation of business at a farmer group level, at a village level up to the issuing of license for each HTR members. The transactional cost is quite significant in amount. It has been mentioned by Kartodihardjo (2006), that there are transaction costs in running the forestry business. This includes HTR programme. Transaction costs are the matters which should be done by the businessmen with both the government and communities to resolve disputes such as land use and others.

In addition to the above transaction costs, developers are also required to spend cost for boundary delineation (HTR location mapping) and changing maps that still occurs in the field, as well as the costs of resolving disputes that occur significantly in the field. Thus, not all costs are allocated to plant trees as they appear in HTR development cost components. This will influence the percentage of planting.

According to communities, the amount of money they received is on the average only Rp 61 millions of the total loan disbursement of phase I of Rp 175 millions. It means that HTR farmers only receive 35% on the average. Meanwhile, it is expected that 400 trees per hectare survive.

According to communities, if the developer would provide them with 70% of the total budget, farmers guarantee that 100% of the plantation will be established. Meanwhile, 30% of total budget is allocated for unexpected costs and other costs. Non-technical factors often become the main reason that affects the success rate of plantation. The reason is that it relates to the activities in the field, in particular tending activity.

Technical factor that becomes the central issue in the field is tree species being planted. Trees recommended for planting in HTR areas are fast growing species. The North Sulawesi province chooses *Paraserianthes falcataria.* This choice is based solely on the easiness to obtain seeds, inexpensive and abundant seeds to fulfill the urgent HTR programme implementation in North Sulawesi. In addition, *Paraserianthes falcataria* seeds were transported from Java and seedling technique uses a sophisticated technique i.e. cocopit media and politube for easy transportation. However, it was observed that *Paraserianthes falcataria* plants growing in the field were exposed to pests that eat the *Paraserianthes falcataria* leaves causing many trees to die. In addition, there has been no industries that utilize *Paraserianthes falcataria* wood in North Sulawesi for both large scale industry and small scale home industry to date. Thus *Paraserianthes falcataria* wood market is still questioned by farmers and other communities.

Based on the above facts, farmers proposed to replace *Paraserianthes falcataria* with *gmelina* (*Gmelina arborea*) or red *Jabon* (*Anthocepalus macrophyllus*) in combination with *cempaka* (*Elmerillia sp*) species, which is the mainstay of the community and the plant grows very well in North Sulawesi. Therefore, the Developer and the Provincial and District forestry offices agreed that the future tree species in HTR areas are those three tree species mentioned above to avoid pests and diseases as well to ensure timber market due to the fact that those wood species have a potential local market.

The reality in the field should be taken seriously into account for the HTR management in the future. The management should have a strategy to anticipate and should take into account in subsequent planning. The point is that the real input for HTR plantation development in the field should have been known in order to calculate the targeted output. At least the real input percentage in the field is equal to the percentage of the expected output.

IV. RESULTS AND DISCUSSION

A. Financial Analysis of HTR Business

1. Stages of Activities in HTR Business

HTR development in North Sulawesi province is done in accordance with SFM (Sustainable Forest Management) concept. The criteria of sustainability is measured based on consistent annual targeted areas and volume increment. The concept is similar to that of HTI (Industrial Plantation Forest). Based on the criteria, the concept of planting is designed to apply the same area annually with the expectation that volume increment will be consistent during harvesting time. To achieve the objective, several activities are done simultaneously, while several activities are done in the same time.

The following is a description of the activities carried out during the stage of the *Paraserianthes falcataria* plantation as shown in the following Table. Table 6 shows the stages of activities in one planting rotation.

Table 6. Stages of activities in 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	TENDING									
1	Tending year 1	√	√	√	√	√	√	√	√	√
2	Tending year 2		√	√	√	√	√	√	√	√
3	Tending year 3			√	√	√	√	√	√	√
4	Extended Tending 1				√	√	√	√	√	√
5	Extended Tending 2				√	√	√	√	√	√
C	FOREST PROTECTION									

1	Pest and disease control	√	√	√	√	√	√	√	√	√
2	Fire control	√	√	√	√	√	√	√	√	√
3	Forest safeguarding	√	√	√	√	√	√	√	√	√
D	HARVESTING/FELLING									√

2. HTR Cost Component

To support HTR development programme, the government provides loan for communities to finance the whole venture capital activities in HTR development until the trees are ready to be cut (end of planting cycle). The loan amount is Rp 8,531,900 millions for each hectare. This is regulated through the Regulation of the Head of Forest Development Funding Centre No. P.01/P2H-1/2010 of 21 January 2010 regarding the Cost Component Financed by the Financing Centre for Forest Industries Plantation Development and Community Forest Plantation, as detailed in the following Table.

Tablel 7. Cost component of HTR business per hectare

No	Activity Component	Unit (Ha)	HTR Unit Cost (Rp)
A	PLANTING		
1	Nursery and seedling	Ha	2,038,200
2	Land preparation	Ha	2,706,500
3	Planting	Ha	575,700
	Total A		5,320,400
B	TENDING		
1	Tending Year 1	Ha	911,200
2	Tending Year 2	Ha	717,700
3	Tending Year 3	Ha	630,000

4	Extended Tending 1	Ha		358,300
5	Extended Tending 2	Ha		179,100
	Total B			2,796,300
C	FOREST PROTECTION			
1	Pest and disease control	Ha		219,200
2	Fire control	Ha		93,000
3	Forest safeguarding	Ha		103,000
	Total C			415,200
	Total A + B + C	**Ha**		**8,531,900**

3. Income from HTR Business

Planting pattern in North Sulawesi province on HTR land is monoculture, without any other plants including alley cropping. Thus, the only revenue expected at the end of *Paraserianthes falcataria* planting cycle (at the 8th year after planting) is *Paraserianthes falcataria*.

Paraserianthes falcataria were planted in HTR sites in 2011. Farmers' income from HTR business is calculated using the proxy approach. Proxy approach on farmers' income is calculated based on the assumption, which appears in Chapter II point D. Based on these assumptions the farmers' income derived from HTR business is Rp 46,800,000/ha, as shown in the following Table.

Table 8. Farmers' income from HTR business per hectare

No.	Number of trees	Round log volume (m³)	Market price (Rp/m3)	Total income (Rp/ha)
1	400	312	150,000	46,800,000

Note: Market price mentioned above is the transaction price of *Paraserianthes* stand (price per cubic meter of standing trees), excluding exploitation cost

4. NPV, BCR, and IRR Analysis

Reduction of benefits and costs at a certain discount rate is a calculation to determine the feasibility of the investment. Criteria used in the assessment calculation whether or not the HTR business is feasible are NPV, BCR, IRR (Andayani, 2008). Calculation of the financial analysis of HTR business uses a discount rate of 10% (adjusted to deposit rate of State-owned Banks in 2012).

The results of financial feasibility analysis of HTR business is shown in the following Table.

Table 9. Financial feasibility criteria analysis of HTR business per hectare in North Sulawesi

No	Activity component	Year							Total
		0	1	2	3	4	...	8	
A	PLANTING								
1	Nursery & seedlings	2,038,200							
2	Land preparation	2,706,500							
3	Planting	575,700							
B	TENDING								
1	Tending year 1	911,200							
2	Tending year 2		717,700						
3	Tending year 3			630,000					
4	Extended tending 1				358,300				
5	Extended tending 2					179,100			
C	FOREST PROTECTION								
1	Pest and disease control	219,200							
2	Fire control	93,000							

#									
3	Forest safeguarding	103,000							
D	TOTAL COST/Ha	6,646,800	717,700	630,000	358,300	179,100			8,531,900
E	INCOME/Ha							46,800,000	46,800,000
	DF (i = 10%)	1,000	0.909	0.826	0.751	0.683		0.467	
	DC (i = 10%)	6,646,800	652,455	520,661	269,196	122,328			
	DB (i = 10%)							21,832,545	21,832,545
	NPV	(6,646,800)	(652,455)	(520,661)	(269,196)	(122,328)		21,832,545	13,621,106
	BCR								1.60
	IRR								24.94

Note: *DF = Discount Factor;*   *DC = Discount Cost;*   *DB = Discount Benefit*   *i = interest*

Based on the calculation of the HTR feasibility criteria, NPV is Rp 13,621,106 Therefore, NPV> 0, meaning HTR is a profitable venture because of the benefits to the project is higher than all of the total costs expended. The calculation results also showed the present value of the net profits received by HTR farmers is positive for one planting rotation of *Paraserianthes falcataria.*

The calculation of B/C ratio is to determine whether a particular sacrifice will obtain higher benefits. The results of the calculation of B/C showed a positive value (1.60). It means that *Paraserianthes falcataria* as a HTR business is feasible to be done. It also means that any expenditure of Rp 1 will give a benefit of Rp 1.60.

IRR calculation is the average rate of annual profits for companies that invest. It is expressed in a percentage (Gittinger, 1986). Based on the calculation, the value of IRR is 24.94 > i value (10%) which means that HTR business is feasible to be implemented because the value of the benefits is much higher than the existing bank interest rate.

B.   Marketing Analysis of HTR Products

Marketing is a human activity aiming to fulfil the needs through a process of goods and or services exchange. To identify the efficiency of a business administration (marketing pattern) of certain products, profit margin, marketing margin, and the level of operational efficiency are applied by using the parameters of mark-up on selling (Desai, 2001). For analysis purpose, information on HTR product marketing channel in North Sulawesi is first identified.

1.   Pattern of HTR product marketing channels

Trading system institutions or market actors involved in *Paraserianthes falcataria* timber business administration activities in North Sulawesi are as follows:

1. Farmers/wood producers
Manufacturers of timber from their own land or HTR farmers.
2. Wood middlemen/brokers
Traders who buy and sell standing trees and sell it by after the timber has been processed or still in a log form. Timber is collected and placed on a timber deck at the road curb. Middlemen or brokers are also called wood collector in Java.
3. Local timber traders
Brokers who sell timber and logs that have been processed, and usually have a small sawmill.

4. Wholesalers

Traders who are able to buy and retain wood from brokers and local traders to be sold to sawmills or other consumers. Traders also buy processed wood such as poles, boards, battens, rafters which are then collected in a place (shop) for sale.

The actors of timber trade system in North Sulawesi in marketing or distribution activities of timber trade in the market today have generally formed four patterns which are:

1. Pattern 1: Producers (farmers) - Consumers (Middlemen, households). In this case, after the timber is cut down, timber is sold directly by producers (farmers) to consumers.
2. Pattern 2: Producers - Middlemen / Brokers - Consumers. Marketing activities are carried out by middlemen to consumers, while producers sell tree stands.
3. Pattern 3: Producers - Wholesalers - Consumers. The wood products are sold by the merchants to the consumers, while producers sell tree stands.
4. Pattern 4: Manufacturers - Middlemen - Wholesalers - Consumers. Marketing activities are done by middlemen and then from wholesalers to consumers. Meanwhile, producers sell tree stands.

In general, *Paraserianthes falcataria* and other wood species are sold by farmers in the form of tree stands. However, farmers also sell timber after the timber is cut down.

There are several methods used in the process of timber sales in three provinces, including:

1. Farmers offer the timber to the middlemen or processors by informing physical conditions of timber such as species, age, and volume.

2. Middlemen or processors observe the location. When they find the expected timber species and size, they will ask the farmers whether the farmers will sell the timber or not.

3. Middlemen and processors get information on timber availability from other parties. Based on the information, they will survey to the location. The informants usually get commission from the middlemen or processors.

Once one of the three processes is done, farmers and middlemen or processors directly bargain for an agreed price until the transaction is done. During the transaction process, the payment method whether by cash or instalments is discussed.

2. Analysis of Marketing Margin and Profit Margin

According to Philip Kotler (1997) the notion on margin carries two meanings: (1) the difference between the price paid by the end user and price received by the producers; (2) fees and marketing services required as a result of demand and supply of marketing services. Thus, the marketing margin represents the difference between the price level at retailers and the price at a producer level. Marketing margin only shows the price difference between retailers and farmers, but it does not give a statement on the amount of products being marketed. Meanwhile, the value of marketing margin is the multiplication of the amount of products that are marketed.

To determine the distribution of the benefits received by each business actors, the following describes the structure of the acquisition starting from the cost analysis of *Paraserianthes falcataria* HTR development up to the determination of the selling price of the product.

a. The market price of *Paraserianthes falcataria* logs

Planting pattern of *Paraserianthes falcataria* is done in monoculture with an initial planting target of 500-600 seedlings. The assumption is that there will be a minimum of 400 trees survive until the end of *Paraserianthes falcataria* cycle (a mature age will be harvested at year 8). Based on the experiences of farmers in the field and supported by several studies (Andayani, 2008; Putra, 2006; Sitanggang, 2009), the 8-year-old *Paraserianthes falcataria* plant has reached an average diameter of 37.6 cm with a stem height of 10 m free of branches. Thus the volume of *Paraserianthes falcataria* logs obtained is an average of 0.78 m3/tree.

Based on a market survey and interviews through FGD method with HTR farmers and timber merchants, the standing tree market price of *Paraserianthes falcataria* for each cubic meter is Rp 150,000.

b. Marketing Cost Analysis

Marketing costs expended by respective businesses actors include chainsaw costs (felling and bucking), transportation costs (from forest to market, and the cost of loading and unloading), administrative costs and other charges. The following is the recapitulation of marketing costs based on existing marketing patterns in North Sulawesi.

Table 10. Type of marketing cost per cubic meter of *Paraserianthes falcataria* logs in North Sulawesi Province

No	Cost Type	Marketing Cost (Rp/m^3)			
		Pattern 1	Pattern 2	Pattern 3	Pattern 4
1	Chainsaw man wage (felling/bucking)	70,000	65,000	65,000	65,000
2	Skidding to logdeck (cattle or men)	45,000	45,000	45,000	45,000
3	Major transport by truck	60,000	55,000	55,000	55,000
4	Loading-unloading (man power)	20,000	20,000	20,000	20,000
5	Administrative cost (permit, retribution, taxes, and others)	30,000	30,000	30,000	30,000
6	Loading-unloading (man power)	-	-	-	20,000
7	Transportation by truck				30,000
	Total	225,000	215,000	215,000	265,000

Source: Analyzed from primary data

c. Analysis of Marketing Margin and Profit Margin

One way to determine the level of marketing efficiency of *Paraserianthes falcataria* logs in North Sulawesi province is by analysing marketing margin and profit margin as shown in the following Table.

Table 11. The distribution of profit margin and marketing margin of *Paraserianthes falcataria* logs based on market pattern in North Sulawesi Province

Remarks	Pattern 1		Pattern 2		Pattern 3		Pattern 4	
	Price (Rp/m3)	Share (%)	Price (Rp/m3)	Share (%)	Price (Rp/m3)	Share (%)	Price (Rp/m3)	Share (%)
Production cost	150,000	35	150,000	32	150,000	30	150,000	29
Marketing cost:	225,000	52	215,000	45	215,000	43	215,000	41
- Felling/bucking	70,000	16	65,000	14	65,000	13	65,000	12
- Skidding	45,000	10	45,000	9	45,000	9	45,000	9
- Major transport	60,000	14	55,000	12	55,000	11	55,000	10
- Loading/Unloading	20,000	5	20,000	4	20,000	4	20,000	4
- Retribution etc	30,000	7	30,000	6	30,000	6	30,000	6
Sales price of log	430,000	100	475,000	100	500,000	100	450,000	86

Profit Margin	55,000	13	110,000	23	135,000	27	85,000	16
Marketing Margin	280,000	65	320,000	68	350,000	70	300,000	57
Merchants								
Marketing cost:							50,000	10
- Trucking							30,000	6
- Loading/Unloading							20,000	4
Sales price of log							525,000	100
Profit Margin							**25,000**	**5**
Marketing Margin							**75,000**	**14**

Source: analyzed from primary data

Based on the results of the above calculation of the distribution of profit margins and marketing margins of *Paraserianthes falcataria* logs, the following information is obtained:

- Pattern 1: farmers' profit margins is 13% (Rp 55,000/m3) and marketing margin is 65% (Rp 280,000).
- Pattern 2: profit margin of brokers/middlemen is 23% (Rp 110,000/m3) and marketing margin is 68% (Rp 320,000/m3)
- Pattern 3: merchant profit margin is 27% (Rp 135,000/m3) and marketing margin is 70% (Rp 350,000/m3)
- Pattern 4: profit margin of brokers/middlemen is 16% (Rp 85,000/m3) and marketing margin is 57% (Rp 300,000/m3), while wholesaler earns profit margin of 5% (Rp 25,000/m3) and marketing margin of 14% (Rp 75,000/m3).

Further information obtained from the above data is that the distribution of the profit by four market actors, namely HTR farmers/HTR license holders, brokers/middlemen, traders and wholesalers, is not equally distributed. The highest profit was earned by the merchants in the amount of 27 % (Rp 135,000/m3), while the farmers/producers of wood received the second lowest distributions of 13% (Rp 55,000/m3). It can be concluded that the marketing or marketing system of logs in North Sulawesi are inefficient due to the distribution of profits earned by individual market actors do not provide a sense of justice in accordance with the cost of investment. According to Andayani (2008), assessing the level of efficiency of the trade system of a product or service can be done from the amount of benefits distributed to each marketing actor. A trading system is considered efficient if the percentage of investment of each

market actor is parallel to the percentage of benefit of each market actor. It means that actors with the highest investment in marketing should get the highest profit among the market actors and vice versa.

d. Operational Efficiency Analysis

According to Andayani (2007), to analyze the level of operational efficiency of marketing, an analysis based on the value of the mark-up on selling (mark-up value based on the selling price) is used. The value of *Paraserianthes falcataria* roundwood marketing operational efficiency in North Sulawesi is found in different patterns of the distribution of benefits of market actors (pattern 1 to 4). Information regarding the level of operational efficiency of marketing and distribution of the benefits received by each business marketing actors according to marketing patterns that exist in the province of North Sulawesi is shown in the Table below.

Tabel 12. Operational efficiency and value distribution of marketing benefits of *Paraserianthes falcataria* logs in North Sulawesi

Pattern	Market Actor	Marketing Magin (Rp/m³)	Sales Price (Rp/m³)	Mark up on Selling (%)
1	Farmer	280,000	430,000	65.12
2	Brokers/middlemen	325,000	475,000	68.42
3	Trader	350,000	500,000	70.00
4	Intermediary	300,000	450,000	66.67
5	Wholesaler	75,000	525,000	14.29

Source: Analyzed from primary data

According to Kohls, RL (1967), the criteria for assessing efficiency of a market mechanism is through its market mechanisms that is capable in delivering products or services from producer to consumer with the lowest possible cost and the equitable distribution of benefits of the price given by the consumer to the involved market institutions.

Based on the data in Table 7, the efficiency of marketing operations of *Paraserianthes falcataria* logs in North Sulawesi ranged between 14.29% and 70.00%. The lowest efficiency value was received by wholesalers with only 14.29%. This is due to the lowest marketing cost that was only Rp 50,000/m3 to

cover only transportation cost in the city. Meanwhile, the highest efficiency value was received by local merchants in the amount of 70% with an average profit of Rp 135,000/m3. The efficiency of farmers/wood producers was 65.12% with the average profit of Rp 55,000/m3. The efficiency value of brokers/middlemen was 68.42% with a mean profit of Rp 110,000/m3 (pattern 2) and 66.76% with a mean profit of Rp 85,000/m3 (pattern 4).

It can be concluded that the pattern of *Paraserianthes falcataria* timber marketing in North Sulawesi is not efficient because the benefits received by the actors are not equally distributed. It can be seen from the indicators of the wide gap in efficiency value, which was between 14.29% and 70% (there was a wide disparity of 55.71%). The gap can also be seen from the profit margins received by market actors which varied between Rp. 25,000/m3 and Rp 135,000/m3 (a wide disparity of Rp, 110,000/m3).

C.   Analysis of Basic Pricing of HTR Products

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

1.   Market Price

The market price is the price established through market mechanism, namely through the process of bargaining between consumers with producers who meet in the HTR marketplace. Based on a market survey and interviews using FGD method with farmers and HTR timber merchants, the average market price of *Paraserianthes falcataria* tree stand in the forest was Rp 150,000/m3.

2.   Stumpage Price

Stumpage price is the level of price that reflects the value of the stand. The calculation of *Paraserianthes falcataria* stumpage price in North Sulawesi was between Rp 115,270 and Rp 123,273 per m3. The value is derived from the calculation as follows:

Table 13. The calculation of *Paraserianthes falcataria* stumpage price in North Sulawesi

No	Cost component	Amount in rupiah
1	Production cost at year 0	8,531,900
	Planting cycle (year)	8
	Bank interest rate per year (%)	8% - 10%
2	Stand value at year 8 (Rp/ha)	15,791,951 – 18,288,885
	Production (m3/ha)	312
3	Stand value (m3/ha)	50,615 – 58,618
	Profit (15%)	8,793
	Risk (10%)	5,862
4	Stand value after profit	59,408 – 67,411
5	Stand value after profit + risk	65,270 – 73,273
6	Fee to land owner per m3	50,000
Stand value after profit + risk + fee (Rp/m3)		**115,270 – 123,273**

Source: Analyzed from primary data

3. Parity or Social Price

Social/parity price is the price that produces the best allocation of resources so as to produce the highest profit. Social price is calculated on the basis of opportunity cost which is the most favourable alternative for HTR products. Social price of HTR wood is derived from the international market price.

Community timber is sold to factories that will process it further into export commodity. The social price is calculated based on the selling price at the factory door. Price parity of *Paraserianthes falcataria* logs in North Sulawesi was Rp 225,000 to Rp. 240,000 per m3, which was calculated as follows:

Table 14. The calculation of parity/social price of *Paraserianthes falcataria* logs in North Sulawesi

No	Cost Types	(Rp/m^3)
1	Log price at the door of factory/industry	470,000 – 500,000
2	Total cost	230,000 – 275.000
	1. Chainsaw man (felling and bucking)	65,000 – 75,000
	2. Log skidding to log deck (cattle or human)	45,000 – 55,000
	3. Major transport by truck	60,000 – 70,000
	4. Load – unload (human power)	30,000 – 40,000
	5. Administration cost (permit,retribution,taxes, etc)	30,000 – 35,000
	***Paraserianthes falcataria* log Parity Cost**	**225,000 - 240.000**

Source: analyzed from primary data

Based on the analysis of *Paraserianthes falcataria* logs standard pricing using three approaches, namely the market price approach, the stumpage price and the parity price, parity price was the highest price followed by the market price and the least was stumpage price. Stumpage price was between Rp 115, 270 and Rp 123 273 per m3, the market price was Rp 150,000/m3 and the parity/social price was between Rp. 225,000 and Rp 240,000 per m3.

According to Irawati, et al. (2008), a standard price policy for HTR products should refer to the price derived from the analysis of stumpage price, market price and parity/social price. By using stumpage price, farmers earn income based on the amount of cost of production plus a profit margin. In other words, HTR farmers earn additional profit slightly higher than the stumpage price. When using parity/social price as a standard price of HTR wood product sales, farmers receive optimum advantage of HTR business.

Based on the three methods and the result of the above analysis, it is recommended that the standard pricing of *Paraserianhes falcataria* logs in North Sulawesi province should refer to the parity price of Rp 225,000 to Rp 240,000 per m3 at standing price or price in the forest before the trees are cut.

D.   Basic Price Fixing Policy for HTR Products

In order to determine the base price for sale of HTR wood products, it should be clearly known in what form the wood is sold (in the form of standing stock, logs or lumber), the price at which level (in the forest, at the logdeck on the edge of the forest, or at the factory door), and the wood species.

Based on the observation in the field and interviews with the HTR farmers, in 2010 – when HTR programme has started in North Sulawesi, only *Paraserianthes falcataria* was planted. In the following years, farmers requested other species to be planted in HTR areas. The tree species are: *Anthocephalus macrophyllus, Gmelina arborea,* and *Elmerrillia spp*. Farmers prefer other tree species instead *Paraserianthes falcataria* because of several reasons. They are:

- The survival rate of *Paraserianthes falcataria* is low due to the vulnerability to diseases as well as inability to be planted under shading trees.
- *Anthocephalus macrophyllus* and *Gmelia arborea* are favoured by farmers for sawntimber. The tree species also grow quickly, are not vulnerable to diseases, has a promising market, can be used as sawntimber and other purposes by communities.
- *Elmerrillia sp.* is the most demanded tree species since communities use the tree species to build their houses and traditional houses as well as for sawntimber. Marketing is easy and timber price is high. *Elmerrillia sp.* is sold to individuals, local traders, and wood traders at a provincial level.

Below the results of market price analysis of HTR products at various levels of marketing and various forms of wood in North Sulawesi in 2013.

Table 15.   Sales parity price of HTR products at North Sulawesi in 2013 in Rp/m3

No.	Wood species	Price of Standing Stock	Price of log at the edge of forest road	Price of log at factory door	Price of sawntimber at a provincial market	Price of timber produced by sawmill at a provincial market
1	*Paraserinathes falcataria)*	240,000	350,000	500,000	1,300,000	1,400,000
2	*Anthocephalus macrophyllus*	280,000	400,000	600,000	1,500,000	1,650,000
3	*Gmelina arborea*	350,000	480,000	700,000	1,600,000	1,750,000
4	*Elmerrillia spp.*	1,500,000	1,700,000	2,000,000	3,250,000	3,500,000

Source: Primary data analysis, 2013.

In the process of buying and selling of logs in North Sulawesi, both individuals and corporation buyers use their own method in determining wood/log volume. The method is called tree tip diameter method. Meanwhile, farmers/producers use the average tree diameter (Smalian average diameter method) as used in this study. The buyers also apply straightness criteria and defects of trees or logs as a reduction factor of the total volume. As a result, there is a difference in the calculation of the volume between farmers and buyers of 30% to 40% from the total volume.

Therefore, there is a need for the government intervention in standard pricing policy of HTR products in order that farmers who are in a weak position in the bargaining process are not disadvantaged by buyers. One effective way is to include the above factor in determining standard price by the government. By considering different measurement techniques in log volume, stem straightness factor and wood defects which are taken into account by buyers to calculate log volume, in North Sulawesi log pricing policy can be done as follows:

Table 16.   The determination of basic price for *Paraserianthes falcataria*, *Anthocephalus macrophyllus*, *Gmelia arborea*, and *Elmerrillia spp.* logs by location

No.	Basic price based on location	Initial Basic Price (Rp/m^3)	Final Basic Price (Rp/m^3)
1.	Price of *Paraserianthes falcataria* tree in the forest (standing volume price)	240,000	312,000 to 336,000
	Price of *Paraserianthes falcataria* logs at logdeck (edge of forest road)	350,000	481,000 to 518,000
	Price of *Paraserianthes falcataria* logs at the factory door / industry	500,000	650,000 to 700,000
2.	Price of *Anthocephalus macrophyllus* tree in the forest (standing volume price)	280,000	364,000 to 392,000
	Price of *Anthocphalus macrophyllus* logs at logdeck (edge of forest road)	400,000	520,000 to 560,000
	Price of *Anthocephalus macrophyllys* logs at the factory door / industry	600,000	780,000 to 840,000

3.	Price of *Gmelina arborea* tree in the forest (standing volume price)	350,000	455,000 to 490,000
	Price of *Gmelina arborea* logs at logdeck (edge of forest road)	480,000	624,000 to 672,000
	Price of *Gmelina arborea* logs at the factory door / industry	700,000	910,000 to 980,000
3.	Price of *Elmerrillia spp.* tree in the forest (standing volume price)	1,500,000	1,950,000 to 2,100,000
	Price of *Elmerrillia spp.* logs at logdeck (the edge of forest road)	1,700,000	2,210,000 to 2,380,000
	Price of *Elmerrillia spp.* logs at the factory door / industry	2,000,000	2,600,000 to 2,800,000

Note:

- Basic Price = Initial Price + 30% up to 40%.
- Basic price is the price of logs, not the price of processed wood/sawn timber.

Based on the above calculation, basic pricing of roundwood sales is done based on the tree species and the location where the logs are sold. The prices are as follows:

a. Standing volume price
- *Paraserianthes falcataria* : Rp 312,000 to Rp 336,000 per m3
- *Anthocephalus macrophyllus* : Rp 364,000 to Rp 392,000 per m3
- *Gmelina arborea* : Rp 455,000 to Rp 490,000 per m3
- *Elmerrillia spp.* : Rp 1,950,000 to Rp 2,100,000 per m3

4. Log price at logdeck
- *Paraserianthes falcataria* : Rp 418,000 to Rp 518,000 per m3
- *Anthocephalus macrophyllus* : Rp 520,000 to Rp 560,000 per m3
- *Gmelina arborea* : Rp 624,000 to Rp 672,000 per m3
- *Elmerrillia spp.* : Rp 2,210,000 to Rp 2,380,000 per m3

5. Log price at sawmill at a provincial level
- *Paraserianthes falcataria* : Rp 650,000 to Rp 700,000 per m3
- *Anthocephalus macrophyllus* : Rp 780,000 to Rp 840,000 per m3

-	*Gmelina arborea*	:	Rp 910,000 to Rp 980,000 per m3
-	*Elmerrillia spp.*	:	Rp 2,600,000 to Rp 2,800,000 per m3

Basic pricing is also based on the consideration that:

- Timber market mechanism in North Sulawesi is still not efficient because merchants receive higher profit margin compared to farmers (who spend the highest cost). There are still opportunities to improve market mechanism to be more efficient. Standard pricing of HTR timber products is rational/ marketable.
- The bargaining position of farmers to determine price is very weak. Price determination is still dominated by buyers/traders causing lower market price as what should be. Therefore, it is relevant to establish the standard price.
- Thus HTR farmers will be encouraged and motivated to manage HTR since they will receive higher benefit. Farmers' participation can therefore help to accelerate HTR development and to improve the economy of communities around forest (in accordance with the principle of the development of pro - poor , pro - growth, pro - jobs , and pro - environment) .

V. CONCLUSION AND RECOMMENDATION

A. Conclusion

1. HTR development with Developer scheme for *Paraserinathes falcataria* in North Sulawesi is potential to be developed in terms of financial feasibility, which is based on investment criteria i.e. NPV = Rp 13,621,106; BCR = 1.60, and IRR = 24.94%. The three criteria stated that the investment is profitable.

2. There are four (4) marketing pattern of *Paraserianthes falcataria* roundwood in North Sulawesi. The four patterns showed that the highest profit margin was received by traders, which was 27% (Rp 135,000/m3). It was followed by the middlemen, which was 23% (Rp 110,000/m3), HTR licence holders (farmers), which was 13 % (Rp 55,000/m3) and the last was 5% for the merchants (Rp. 25,000/m3).

3. The average marketing margin received by merchants was the highest, which was 70% (Rp 350,000/m3). It was followed by the middlemen, which was 68% (Rp 320,000/m3), HTR license holders (farmers), which was 65% (Rp 280,000/m3) and the lowest margin was received by the wholesalers, which was 14% (Rp 75,000/m3).

4. The highest operational marketing efficiency was received by local traders, which was 70%. It was followed by middlemen, which was 68.42%, farmers (65.12%), and wholesalers (14.29%). Thus, government intervention is needed to create a market competition, so HTR programme will benefit farmers.

5. *Paraserianthes falcataria* wood marketing system in North Sulawesi province is not efficient yet, both in terms of marketing margin, profit margin as well as the operational efficiency level.

6. Basic price of HTR product sales in North Sulawesi province should be established through the government intervention to provide a realistic basic price that will protect the business of HTR farmers. Basic pricing of logs per cubic meter at the factory door or industry for *Paraserianthes falcataria* is Rp 650,000 to Rp 700,000; for *Anthocephalus macrophyllus* is Rp. 780,000 to Rp 840,000 ; for *Gmelina arborea* is Rp 910,000 to Rp 980,000, and for *Elmerrillia spp.* is Rp 2,600,000 to Rp 2,800,000.

B.   **Recommendation**

1. The development of means and infrastructures such as roads to HTR sites to enable vehicles to transport HTR products from HTR sites. This will reduce trading/marketing costs, increase the basic price of HTR products and increase the benefit for market actors. Transportation cost component is the highest cost expended in the analysis of trading cost components.

2. There is the need to construct wood industries close to HTR sites to absorb HTR wood products in the beginning of the second planting rotation.

3. Awarding farmers for their efforts in HTR development shoud be encouraged to motivate farmers to participate in HTR development more actively.

4. There is the need to be more selective in selecting credible Developers with experiences in forest plantation development. Therefore, it will not be obstacles in HTR development.

5. It is necessary to have field verification to ensure that farmers who will receive HTR license are sharecroppers in the HTR location. It aims to eliminate land conflicts among HTR farmers as what is happening to date.

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