

The Impact of Eco-labeling and Forest Certification on Teak Forest Plantation

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Abstract: This paper deals with eco-labeling and certification process of forest. There are two objectives of the paper are; (a) to evaluate the impact of eco-labeling and forest certification on teak forest plantation, (b) to determine the financial feasibility of eco-label teak plant business with paddy rice (intercropping). This research was conducted in South Konawe District, South East Sulawesi, Indonesia using stratified random sampling with 62 farmers as respondents. Data were analyzed quantitatively and descriptively. Quantitative analysis was performed by using paired sample test, NPV, B/C and IRR. The result of the research indicates that ecolabel certificating process in KHJL involving many parties (collaboration) and conducted through these processes: selecting certificate giver, avoiding gap between certificate giver standard and KHJL forest management, consulting with stakeholders, reporting and certificating forest management; The ecolabel certificating process gives effect on the changes of planting pattern and the size of teak plant field. The effect on changes of planting pattern is indicated by the shifting of agroforestry planting pattern to simple agroforestry. The effect on field size of teak plant field is indicated by the improvement of average size of field from 0.53-2.07 ha per farmer. By considering three criterions (NPV value of df 18% equals to Rp 63.978.638,- NBCR value is greater than 1 in the amount of 8, and the IRR value of 41.26% or $IRR > 18\%$), it can be said that, financially the certificated teak processed for business worth for exploration and expanded.

Keywords: Ecolabel certificating process, planting pattern, the size of teak plant field, financial analysis

1. Introduction

Forest is the heart of the world. The importance of preserving the forest through preserved management has become something crucial throughout the world. Some research on preserved forest management has been conducted by Datta *et al.* (2012) in India, Kufuor (2004) in Ghana and Bizikova (2012) in Roma. The impact of preserved management was studied by Datta *et al.* (2012) in an intensive study case in West Bengal Range Nayagram Forest on Joint Forest Management (JFM). The functioning of a forest protection community as a cohesive group was found to be the major determinant in achieving sustainability in forest management. Maintenance of such institutional sustainability is recommended for better conservation of these highly stressed forest lands. Kufuor (2004) examined the problem of increasing timber logging from an institutionalism point of view. The article sets out hitherto unexamined rationales for the failure to reverse deforestation in Ghana. The development of multifunctional forestry in the mountains of Slovensky Raj National Park specifically focused on the involvement of local communities, particularly the Roma minority in the sustainable forest management (SFM) of the Park. All this cannot be, however, separated from the weak role and inter-agency coordination creating ego-sector, horizontal and vertical conflicts among institutions, indicating the weak of smallholders institutional (Arsyad, Nuddin and Yusuf, 2013) including the farmers who are settling in and near forest area.

In Indonesia, particularly in Southeast Sulawesi Province, since 2003 a consortium of several LSM (Non Government

Organizaton) and mass media took some initiatives in establishing the Network for Forest (JAUH) in Southeast Sulawesi with an objective of local people participation in the try out program of Social Forestry (SF) conducted by Forestry Department. Similar studies have been attempted by Bizikova *et al.* (2012) where the way forward in successful SFM is the integration of multi-purpose forest management together with community development. The critical pre-conditions success factors include learning, repeated stakeholder interaction, trust-building and cooperation between and within multiethnic local communities. Such an involvement by the local people will benefit both the majority and the minority populations, particularly allowing for discussions about future development of mountain forests, their local economies and communities, and for providing some guidance about what are the preferred actions for participation in multifunctional SFM. It means they need information or extension on these particular cases. In line with Ekasari's findings (2013) that social learning-based extension should be developed as a potential way to sustain an important role of extension in agricultural (including forestry in broad sense) and rural development.

The initiation of such participatory program by JAUH of Southeast Sulawesi was supported by multi-stakeholder of the Forestry Department programs including international agencies such as Department of Forestry International Development (DFID), Japan International Community Asia (JICA)-Ministry of Forestry (DEPHUT), Watershed Management Board (BPDAS) Sampara Southeast Sulawesi, Forestry Department

of Southeast Sulawesi Province and others. In order to improve the effectiveness of sustainable forestry, farmers established cooperation with the name Koperasi Hutan Jaya Lestari (KHJL). One of the successful international cooperation programs achieved by KHJL was the successful eco-labeling of their teak forest obtained from the Forest Steward Council (FSC) in April 2005. One of the requirements to achieve the Eco-label Certificate was a detailed inventory of teak wood owned by people, member of the cooperation, with clear statement of teak harvesting policy to ensure the future regeneration of teak after the sustainable harvest. This includes the cutting down of one teak tree to 10 replanting of teakwood trees close or in the vicinity of harvesting. In addition, another policy known as “*lacak balak*” has also been implemented where every single teakwood harvested needs to be firstly tagged. Tagging was done on the pole left behind; thereby the origin of the wood can be tracked down back based on the tagged pole. The tagging of teakwood will provide clear information with regards to the number of teakwood, stem, owner code and location or source (village) of the teak that has been felled. In this manner, the management of the private/righted forest in preserved way is carried out according to the concept of sustainable forest management.

The criteria or indicators of SFM based from the Rio Summit can be easily obtained from the Montreal and Helsinki Process, as well as through various forest certification schemes. In general, SFM refers to the ways and processes of managing forest resources to meet society’s varied (social, economic, and ecological) needs, today and tomorrow,

without compromising the ecological capacity and the renewal potential of the forest resource base. In economic terms, the main distinguishing features of SFM are the recognition of diverse and dynamic preferences of local people and other stakeholders, the incorporation of multiple sources of value and utility from the forests (including non-market values), the incorporation of multiple products and services in the production process, public participation in management decisions through non-market mechanisms, inter-generational equity, and a system approach to forest management (Kant and Berry, 2005).

Research conducted by Lidestav and Lejon (2011) showed that certified and non-certified forest products are usually managed differently. With forest certification, forest owners tend to gain more economic and environmental benefits. The eco-labeled teak private owned forest has an impact on the teakwood price run by KHJL with a much higher price of 150% for teakwood export market. Such a price impact created a significant rise on the price leading the private owners to intensively expand their teakwood plantations with a different planting pattern. The opportunity created by the government through the existing regulation and facilitated by KHJL is expected to encourage people to start independent teakwood management. The expansion of teakwood was aimed to increase the supply of teakwood for future industry and add to the owner income in the process. A research reported by Aagesen (2001) in Chubut, Argentina clearly indicated that the elimination of third-party timber extraction, either by privatizing

native trees or granting community forest concessions, could provide more incentives to a sustainable forest resources with numerous environmental and socioeconomic issues addressed to ensure the long-term viability of Chubut's effort to promote sustainable plantation of exotic conifers. In practice, the poor are often restricted to using forest and tree resources only to help mitigate poverty while the local elites and outsiders are able to harness the same resources, either legitimately or illegally, in order to accumulate wealth. While elites in a society can often dictate or influence the way natural resources are managed, the poor are often left only to respond to situations devised by and for others. This lack of control and attendant insecurity can make it almost impossible for the poor to plan, invest or improve their situation through forestry (Mahanty *et al.*, 2006). The fact that natural forests and poverty are found in the same place in some areas of the world is no accident. Natural forests are home to human evolution and human populations that have lived there for millennia are at a relatively low level of socio-economic development. Moreover, migrant rural populations that colonise forested areas and seek new agricultural lands are often relatively poor. Forests often serve as an employer of last resort for economically marginalised people, for example, due to skewed land distributions in the lowlands. In the course of history, forests have often served as a refuge for less powerful people fleeing oppression, conflict and war (Sunderlin *et al.*, 2004). For example, (Gilmour *et al.*, 2004) argued that community forestry has provided some tangible benefits to poor people, the

incidence of poverty is positively correlated with forest cover at the district level (Tacconi and Kurniawan, 2006). These debates revolve around questions of whether forest loss causes poverty or poverty contributes to forest encroachment, and questions of whether it is loss of access to forests or dependence on forest-based livelihoods that cause poverty (Fisher and Hirsch, 2007).

With the economic and environmental benefits of eco-labeling and teak forest certification, more small scale private woodlot owners tend to well accept the implementation of forest certification. As such, it is pertinent to analyze the financial value of the newly certified South Konawe Community Forest. It is expected from the certification that their teak forest will be managed in a sustainable manner with better prosperity compared to the non-certified forest. Given the current situation, it is really necessary to construct the research on eco-labeling and forest certification as a challenging issue in promoting society welfare. Two specific purposes of the paper are. The first is to evaluate the impact of eco-labeling and forest certification on a teak forest plantation. The second is to determine the financial feasibility of eco-label teak plant business with paddy rice (intercropping).

2. Materials and Methods

2.1 Time and Location of Study

This research was conducted on a privately owned Teak Forest within Koperasi Hutan Jaya Lestari area in sub-district Laeya and sub-district Palangga, which forms the biggest community forest in the study area. In addition, most of the community forest farmers are members of KHJL. The research

was conducted for a period of three months effective from January 2010 to March 2010.

2.2 Population and Sampling Technique

A total of 206 respondents who were members of KHJL were selected from two sub-districts. The primary source of data was taken from the certified forest farmers teak woodlot owners. To ensure a complete representative of the sampled population, a Stratified Random Sampling based on the age of the teak plantation was used to analyze the costs and benefits (C/B).

2.3 Data Collection

Both quantitative and qualitative data were gathered in this study. The primary data were obtained from personal interviews using prepared questionnaires. The primary data includes the identity of respondent, the size of teakwood planted area, the number of teakwood per hectare, the plant pattern style, costs, income from teakwood, and the certification processes in managing the community forest. Secondary data collected were members' data, size of the field run by KHJL, growth increment and South East Sulawesi teakwood volume development.

2.4 Data Analysis

The process of certification was descriptively analyzed using similar process done by KHJL and other associated parties. The impact of Certification was analyzed by a paired sample t-test to determine if there is a change in the size of planting area for teakwood before and after certification. In addition to determine the change in size on the area before and after certification, the difference in planting pattern by members of

KHJL before and after forest certification was also descriptively analyzed. The Financial feasibility study of planting teak with upland rice intercropping was considered in the BCA calculation. The ecolabel forest certification program in South Konawe has been implemented for the past five years. Therefore, calculating the cost of teakwood processing in year 6th to 15th was conducted based on the estimation for the 4th year. The profit for year 15th was estimated by calculating the teakwood volume indirectly, that is by using the Volume Table based on the diameter and height growth incrementst. To run a hypothesis test on community forest business with certification program in South Konawe Sub-District financially worthy, the Cost-Benefit Analysis (CBA) was applied.

2.4.1 NPV analysis

$$NPV = \sum_{t=0}^{t=n} \frac{B_t - C_t}{(1+i)^t} \dots\dots\dots(1)$$

- where:
 NPV = Net Present Value
 B_t = Benefit of year-t
 C_t = Cost of year-t
 I = Discount rate (in decimal)
 t = Year
 n = Duration in year

2.4.2 BCR Analysis

$$B/C \text{ Ratio} = \frac{\sum_{t=0}^{t=n} \frac{B_t}{n}}{\sum_{t=0}^{t=n} \frac{C_t}{n(1+i)}} \dots\dots\dots(2)$$

- where:
 BCR = Benefit Cost Ratio
 B_t = Benefit of year-t
 C_t = Cost of year-t

i = Discount rate (in decimal)

t = Year

n = Duration in year

If $BCR > 1$ and $NPV > 1$ means that the certification of people forest is worth developing.

2.4.3 IRR analysis

$$\sum_{t=0}^n \frac{B_t - C_t}{(1 + i)^t} = 0 \quad \dots\dots\dots(3)$$

where:

i = IRR

B_t = Benefit Cost of year- t

C_t = Cost of year- t

t = Year

n = Duration in year

Note: The teakwood is considered a financially worthy business when: (a) NPV is more than zero ($NPV > 0$), (b) $IRR > i$.

2.4.4 Analysis of sensitivity

The fundamental purpose of using this analysis is to see the impact of the changing of parameters (the benefit decreases by 20%, and cost increases by 20%) on financial feasibility of teakwood (intercropping) with rice paddies.

3. Results and Discussion

3.1 Process to Get Certification

There are some processes the Koperasi Hutan Jaya Lestari needs to going through to get the ecolabel certification, they are: Deciding the Certification Institution, field visiting or pre assessment, closing up the gaps and processing decision, obtaining stakeholder decision, conducting main assessment, report making and reviewing. KHJL went through standard TFT as the escort in forest management of KHJL.

The main assessment was carried out by FSC auditor, Smartwood. Smartwood team will assess the KHJL according to the 10 principles and 56 criteria of FSC, which takes place annually.

There are three aspects where development of KHJL plays part on certification. First, social aspect; as connecting media among communities on society, and also with buyer. Second, ecological aspect; as control to hospitality on community to the forest includes replanting, preserving the spring, stopping hunt and rejection of using pesticides. And the third is economic aspect; to support community economy by improving the forest products, certification of forest institution, distribution of seed and transparency of profit distribution.

3.2 Impacts of Certification

After five years of KHJL's certification the apparent impact was the increase of community income and the improvement of knowledge on members of KHJL in teakwood management. More than the impacts, some changes from the certification that can be seen are:

3.2.1 Changes on planting pattern

Based on the observation, farmers started to change their planting pattern upon moving to the new field. When in the old way they use the forest as their plantation ground with complex agro forestry system and some uses teak as the fence for their plantation while there are only 50-100 trees. After certified, they started to change into simple agro forestry which is in early years they employ a system known as tumpang sari with paddy, usually up to three harvesting seasons of paddy so when the teak reaches two years

old it becomes a monoculture on the same age. There are some reasons why the farmers start abandoning the complex agro forestry system that they have adopted before; The growth of teak and other plantation plants are limited after the Teak crown becomes wider, it takes big money for starting and more intensive care, there are still spaces in South Konawe, teakwood plantation is viewed as investment, therefore the farmers rely on paddy rice plantation, entrepreneur and civil service to make a living.

Research on farmer and forest management conducted by Perez *et al.* (2012) in Spain shows that the forestry production capacity for the area in which the agricultural holding is located, the size and the number of plots in the land base, the number of years the farmer has been the owner and the economic yield from the holding over the total family income were key factors in distinguishing between farmers with forestry activity (forestland owners) and farmers with no forestry activity (farmland owners). These findings could be used as a guide for designing, planning, and implementing research and policy measures that could allow NIPF landowners with farming and livestock activity to develop sustainable forestry, as key agents in promoting rural development.

3.2.2 The size of teakwood plantation

The output of paired sample test shows there are difference between the size of teakwood plantation before and after certification program. In general, farmers started with their land planted with teakwood area of 0.5 ha where most of them apply mixed plantation pattern (*wanatani*). After certification, farmers in Laeya and Palangga

sub- districts owned 2 ha of plantation in average with the new pattern, intercropping with rice paddies.

There are some reasons why people in South Konawe like teakwood better than rice paddies because it is easy to plant, easy to manage, takes minimum portion of input after planted, steady market because of ecolabel certification, attractive price, increased along the time while other commodities (cocoa and cashew) is constant, can be harvested at will, and serve as a savings.

3.2.3 Financial analysis of teakwood intercropping with rice paddies

The calculation shows that NPV value for interest rate of 18% community forest intercropping with rice paddies is Rp 63,978,638, B/C ratio of 8, and IRR of 41.26%. The value of feasibility is higher compared to non-ecolabel teakwood farm in BPDAS Project (Nursyamsi, 2009). The high rate value is triggered by the high demand and price of eco-label teakwood in foreign market. There are some factors that lead to the high price and demand of eco-label wood in foreign market. This includes the increase global awareness of the impact and mismanagement in exploiting the global forest resources, with wide impact across the nations.

3.2.4 Analysis of sensitivity

The analysis of sensitivity of the case shows that changes on teakwood processing result in the benefits decreases by 20% and the cost maintains then the feasibility is NPV Rp 47,165,679, B/C ratio of 5.3 and IRR of 31.95; (b) if benefit maintains while the cost increases by 20%, then the feasibility is NPV Rp 59,961,407 B/C ratio of 5.6 and IRR 35.9.

The value suggests that the business of teakwood is based on interest rate of 18% is in fact worthy for any negative changes that may arise in the process. The table shows that the benefit decrease by 20% will lead to the decrease of NPV, B/C ratio and level of IRR. However, of the two negative changes, an increase of 20% cost will result on decrease of NPV more rapidly compared to the effect of decrease in benefit. This indicates that premium price of eco labeled certified teakwood is highly stable.

4. Conclusion

Eco-label certification process in KHJL South Konawe involves many parties (collaboration) and process. Eco-label certification has an impact on the farmers planting pattern from complex agroforestry into simple agroforestry and the size of teakwood plantation ground from the average 0.5 ha to 2 ha/farmer. Financially, certified eco-label teakwood is worth the effort for a bright future farmer's economically viable development project.

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