(REVIEW ARTICLE)

Hampangen education forest development strategy, university of Palangka Raya

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Abstract

The Hampangen Educational Forest is a forest whose area is designated as an area to improve education in the forestry sector with a Special Educational Function for Forestry students at the University of Palangka Raya. The aim of the research is to identify the potential of the forest and to formulate a Hampangen Educational Forest Development Strategy, Palanga Raya University. This study uses a combined method by combining an activity to obtain more comprehensive, valid, reliable and objective data. The results obtained can be developed through a study program through Agroforestry, Non-Timber Forest Products, Ecotourism, Environmental Services, Mushroom Cultivation, Honey Bees, and Rattan Crafts, with the development strategy being in quadrant IV position which is applied defensively (Defensive Strategy) must minimize weaknesses - weaknesses and avoiding external threats by establishing partnerships through investors, optimizing the cultivation of non-forestry plant commodities, maximizing the role of assistants and the University of Palangka Raya, involving more cross-sectoral and improving infrastructure for tourism forest development and natural forest research.

Keywords: Forest; Rattan; Environment; Agroforestry; Ecotourism

1 Introduction

Forests are a resource that has a very important role in the socio-economic life of a society that is so complex, and consists of various interests that can trigger social conflicts between parties who have direct contact in forest control, including the community, so that it can damage natural resources and social order in society. [1]. This problem can be anticipated and improved by building and managing forests jointly from both the government and the community so that forests remain sustainable, useful and sustainable [2,3]. Community involvement in forest management is necessary and a necessity so that it can be minimized by increasing public awareness of forest sustainability with various alternative policies in community-based forest management [4, 5, 6, 7]. These community-based forest management policies can be manifested in the form of social forestry programs.

Social Forestry is a system of sustainable forest management implemented in state forest areas or private forests or customary forests implemented by local communities as the main actors to improve their welfare, environmental balance and socio-cultural dynamics and this concept has been accepted and recognized as one of the most effective approaches. both in order to achieve sustainability and forest sustainability [8,9].

The currently managed Hampangen Educational Forest is one of the forests in Katingan Regency which was determined based on the Decree of the Minister of Forestry No. 311/Kpts-II/1993 dated 17 June 1993 covering an area of 5,000 ha. The management of the education forest area is carried out by the Ministry of Forestry and its utilization is carried out by the University of Palangka Raya in cooperation with the Ministry of Forestry. Guidance and supervision of the use of

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the educational forest is carried out on a daily basis by the Regional Office of the Ministry of Forestry of Central Kalimantan Province [10].

Based on its development and management and utilization, it encourages researchers to conduct research on the implementation of educational forest development, so that the implementation of hampangen educational forest can provide wider access, and can be utilized by the world of education and the local community through village institutions in utilizing forest resources in a sustainable manner. Sustainability of the implementation of the Hampangen Educational Forest is intended by optimizing the potential and models developed in determining the formulation of the Hampangen Educational Forest Development Strategy.

2   Research methods

The research was conducted in the Hampangen Educational Forest Area of Palangka Raya University, located in Katingan District, Central Kalimantan Province. The research was carried out for 3 months from July to October 2022. This research used qualitative and quantitative methods [11, 12]. This research method combines two qualitative and quantitative research methods in a research activity so that more comprehensive, valid, reliable and objective data will be obtained [14, 17]. Qualitative methods are used in relation to the need to answer questions about the socio-cultural conditions of the community, internal factors and external factors in the development of the Hampangen Educational Forest. The quantitative approach in this study uses a matrix of internal and internal factor analysis. Evaluation Factor (E) is carried out to determine strengths and weaknesses; External factor analysis (EFE) was carried out to determine opportunities and threats in alternative forest development strategies with SWOT descriptive analysis [13].
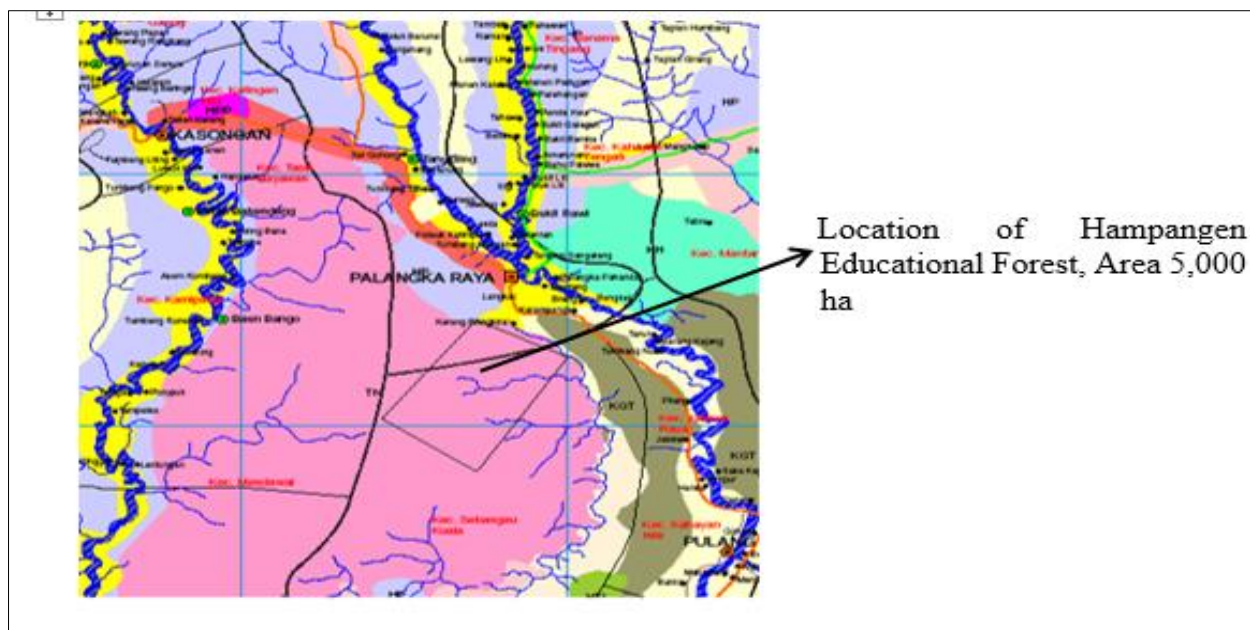

Figure 1 Location of Educational Forest Administration

3   Results and discussion

3.1   Characteristics of Respondents

Data collection through purposive sampling of informants was carried out to complement the data of each respondent regarding the broad general view, the conditions of the respondents around the Hampangen educational forest [12, 14]. The information obtained can provide an overview of the condition of the community around the Hampangen Educational Forest, through the distribution of questionnaires which can be described in the form of the characteristics of the respondents according to the categories described in Table 1 below.

According to the data characteristics of each respondent who was around the Hampangen Educational Forest, the data from the questionnaire tended to show the most dominant frequency. The result of the description is that people who work productively still depend on the nature around them [15, 16]. The main occupation of the people around it is

farming, farming, mining and gardening. The types of plants in the fields and paddy fields are types of food plants, while for the types of garden plants are types of annual plants. Types of food crops cultivated by the community include cassava, corn, sweet potatoes, beans and vegetables. Types of annual plants such as coffee, rubber, rattan and bananas. These plants are grown for commercial purposes by selling to the market. Most people have rattan gardens which are harvested every year to obtain money which is used as a medium of exchange to buy goods that are not available in the community, payment for education and health expenses. and side jobs to make ends meet such as hunting, gardening, raising livestock. The average net income each month is in the range of IDR 1,000,000 - IDR 2,000,000.-. To optimize the land, some people have also planted bananas and fruit in the garden area to supplement their income.

Table 1 Characteristics of Respondents in the Hampangen Educational Forest

Description of Respondents	Category
Gender	Male gender 65% when compared to 35% female
Age	Most are in the range of 40-50 years
Level of education	SD (Graduate) 38%; SMA 60% undergraduate (S1) 2%.
The main job	The majority of 75% farming and farming.
Side job	The majority choose entrepreneurship such as logging from the forest, hunting, mining, selling plantation products.
Origin of the Head of the Family	85% come from the Dayak tribe; 15% of immigrants come from the Javanese tribe.
Ethnic group	The majority of the Katingan Dayak tribe is 95%; Javanese 5%.
Total Income	45% of income Rp. 1.000.000 - Rp. 2.000.000,-; and 10% of income more than IDR 4,000,000.-
Marital Status and Number of Family Dependents	80% of the majority are married; 20% married status and widower status.
Land and building ownership status	95% own status; 5% has customary land status
Land area for Community businesses around the forest	The majority of the land area of each village ranges from 2-10 ha.
Plant Types	Dominant such as meranti, keruing, rubber, rattan, fruits.

Source: Research Results (2022)

The community, in order to take advantage of their spare time, also raises livestock. The livestock products are used to meet the needs of family side dishes, party preparations and investment for sale. The type of livestock that is mostly kept by the community is pigs. Other animals that are kept by the community are chickens, as for other types of animals such as cows.

From this area, the community has used the Hampangen Educational Forest to fulfill their daily needs, both for subsistence and commercial activities [15, 16]. The needs of the community include wood for repairing or building houses, fruits, vegetables and game for food, as well as other natural products to meet the needs of the community.

Communities still depend on the nature around them, plantation products that are mostly used by the community such as rubber and durian fruit, utilization of forest products by converting raw materials into semi-finished or finished goods, is an important thing to do in order to realize a sustainable forest village development program and independent. Meanwhile, for rubber and honey forest resources that exist in the community, it turns out that based on new information as a side activity to make ends meet [16].

3.2   Community Utilization of Plants

Parts of plants used for consumption by the community around the Hampangen Educational Forest for vegetables such as Anacardiaceae, Moraceae, Myrtaceae, Sapindaceae, Lamiaceae, Verbenaceae. Several species that have the potential to be developed are tamarind (*Mangifera macrocarpa*), cempedak (*Artocarpus integer*), Durian (*Durio zibethinus*), Guava (*Syzygium* sp), Rambutan (*Nephellium lappaceum*), Sungkai (*Peronema canescens*) [16, 17].

The surrounding community still practices traditional medicine, such as using species for curable diseases such as postpartum medicine such as preventing jaundice, liver disease using yellow root plants (*Santiria griffithi* (Hook. F.) Engl.), preventing toothache such as Balam red (*Mallotus* sp.); Prevent ulcers such as Lemba Onions (*Eleutherine palmifolia*), Prevent coughs such as Nettles (*Dendrocnide elliptica*); Internal medicine such as Kalapapa (*Vitex pinnata*), cancer medicine such as Nepenthes; stomachache medicine such as Telapak (Lepisanthes sp.), Ant nests (*Epidendroides* Sol); Cholesterol drugs such as, ant nests (*Epindroides* Sol); preventing dengue fever such as Pasak bumi (Eurycoma longifolia); High blood pressure medications such as Sungkai (*Peronema canescens*). Parts of plants that are used as fermentation include Alang-alang (*Imperata cylindrica* (L.) Beauv.), Sahang (*Piper Albi* Linn), Tewu (*Saccharum officinarum* L.), Uhat Enyuh (*Cocos nucifera*, Linn), Uhat areca (*Areca cacteche*) L.). These ingredients are usually made with a mixture of other ingredients to make drinking wine called baram.

Parts of plants used as building materials such as Medang (*Litsea firma*), Sungkai (*Peronema canescens*), Ulin (*Eusideroxylon zwageri*); Keruing (*Dipterocarpus* sp.), Mahang (*Macaranga triloba*), Medang (*Dehaasia* sp.), Meranti (*Shorea leprosula*), Pilang (*Artocarpus* sp.), Pulai (*Alstonia scholaris*). Other plant materials such as Banitan (*Gomphandra* sp), Rubber (*Hevea brasiliensis*) [16].

Meanwhile, research conducted in the Dheeraa area, Ethiopia, showed that 92% of the medicinal plants there were obtained from natural vegetation areas indicating that the local population there lacked the practice of planting medicinal plants in cultivation areas such as yards and gardens [18].

3.3 Forest Potential

The Hampangen Educational Forest is part of the remaining tropical peat swamp forest in Central Kalimantan Province which is in relatively good condition compared to the surrounding area, so that the forest can provide ecological and economic benefits to the surrounding community. An assessment of the potential of natural resources found in the Hampangen Educational Forest was carried out in order to take stock of the potentials so that management is carried out in a sustainable manner that is right on target and can be optimally utilized while maintaining environmental sustainability. Identification of the potential that is carried out will be very helpful in seeing the potential of timber forest products, the potential of non-timber forest products, the potential for utilization of forest areas as well as the potential for ecotourism and environmental services [19].

3.4 Potential Timber and Non-Timber Forest Products

Hampangen Educational Forest is currently an endemic plant such as Meranti, Tengkawang, Keruing and Ulin wood. Based on the plan for the development of timber forest products with the development of monoculture plants of the sengon type, it is very possible to develop them using an agroforestry pattern. Based on observations, potential NTFPs contain forest bananas (abaka), forest fruit, pasak bumi, saluang, wild boar, deer, bears, pangolins, honey bees, orchids, mushrooms. Currently, the use of NTFPs can be developed such as honey bees, mushrooms, pasak bumi (*Eurycoma longifolia* Jack.), saluang not (*Luvunga sarmentosa* Kurz.), and roots of medicinal plants, with a target of 1,000 kg for 9 years [19, 20].

3.5 Ecotourism Potential and Environmental Services

The existence of the Hampangen Educational Forest is one of the solutions that can be used to deal with global warming. Global warming has an impact on the environment because it can cause changes in wind patterns, changes in rainfall, changes in the hydrological cycle and others. The existence of the Hampangen Educational Forest indirectly contributes to reducing the impact of global warming through carbon absorption [21, 23]. In addition, it has a natural forest ecosystem that is rich in trees and has an important role as a barrier to erosion and regulates the water management system.

Utilization of environmental services can be managed by maintaining the species in the area as natural attractions. Regulation of the Directorate General of Social Forestry and Environmental Partnerships No. P.23/PSKL/SET/PSL.30/12/2016 dated 30 December 2016 concerning Guidelines for the Role of Business Actors in the Implementation of Environmental and Forestry Protection and Management, explained that the adoption of trees in the context of empowering indigenous peoples, forest conservation and social forestry. Utilization of environmental services by developing a tree adoption program guided by the understanding of adoption of the extension process can be interpreted as a process of changing behavior in the form of: knowledge (cognitive), attitude (affective), and skills (Psychpmptoric) in a person after receiving the "innovation" presented extension services by the target community.

The definition of tree adoption is defined as the act of maintaining and utilizing the tree species in the area. The community takes responsibility for planting and caring for the saplings voluntarily from the preparation stage, planting to maintenance until they grow for 3 years [22]. Determine the minimum number of trees to be adopted, for example for individuals as much as 1 tree per 3 years while for companies or agencies as many as 200 trees per 3 years or for every 1 tree adopted by the adopter, the community is required to plant 4 restoration trees.

The tourism potential of the Hampangen Educational Forest can be a support for this area for the welfare of its people by developing natural tourism objects. Tourism objects in the Hampangen Educational Forest which are considered strategic and have promising prospects in the future, with a special attraction for visitors or tourists who come from various places to enjoy the natural surroundings, in the form of rare and endemic flora such as meranti (Shorea sp.), keruing (*Dipterocarpus baudii* Korth.), continents (*Shorea guiso* Bl.), swamp jelutung (*Dyera polyphylla* (Miq.) V. Steenis.) and others. The sounds of wildlife are loud, like those of the Bornean gibbon (*Hylobates albibarbis* Lyon.) even though you don't have the chance to see them physically, and the sounds of birds are like the types of pigeons (*Treron griseicauda*), rock magpie (*Copsychus malabaricus* Scopoli), green gecko (*Chloropsis sonnerati* Jaridine). and Selb.) and parrots (*Psittacula alexandri* L.). Other fauna is monitor lizard (*Varanus salvator*) [16].

3.6   Development Strategy

Determination of the development strategy is formulated using SWOT analysis. SWOT analysis is an analysis used to systematically identify various internal and external factors in order to formulate a problem solving strategy. SWOT analysis basically considers logically by maximizing internal factors, namely strengths and opportunities, but simultaneously can minimize external factors, namely weaknesses and threats [13]. Strategy determination can go through several stages of analysis including analysis of internal factors (IFE) and external factors (EFE), determination of strategy quadrants based on matrix space analysis, grand strategy formulation based on strategy quadrants and determining strategic priorities based on QSPM analysis results.

The SWOT analysis begins with the identification of aspects that influence the strategy, obtained from the results of interviews with parties such as the Head of the Katingan KPH, Academics, Forestry Extension Officers, and the Head of the Katingan Natural Resources Conservation Resort. The assessment is divided into two groups, namely internal factors (IFAS) consisting of strengths and weaknesses and external factors (EFAS) consisting of opportunities and threats. These factors are identified in the planning strategy which is used as a basis for determining the necessary improvements in further development. The factors identified as strengths in the development of the Hmpangen Educational Forest are land potential, community perceptions and farmer institutions, while the identified weaknesses are low farmer resources, inadequate assistance such as lack of training and limited human resources for apparatus or extension officers [13]. Factors identified as external factors are market opportunities, capital from the Ministry of Forestry, support from the leadership of the University of Palangka Raya or the regional and central government through policies and programs and the existence of supporting institutions such as FMUs. The threat factor consists of the absence of investor certainty.

Tabel 2 Analisis Matriks Space (IFE)

Factor Analysis	Score	Position Index (A+B)
Internal factors		
Strength	4.443	-1.37
Weakness	3.078	
External Factors		
Opportunity	3.805	-0.27
Ancaman	3.535	

Determination of the Development Strategy for each of the four factors is analyzed based on the components of each factor to be given an assessment. Based on the results of the analysis of internal and external factors, it was obtained that the weighting score for internal factors was -1.37 and external factors -0.27, from these values it was plotted consisting of 4 (four) quadrants where the strengths and weaknesses factors were on the X axis while the opportunity factors and threats are on the Y axis. The X axis values are obtained from the differences in strengths and weaknesses

factors, while the Y axis values are obtained from the differences between opportunity and threat factors, which are in the external Quadrant IV.

3.7 Policy Support Strategy

Based on the SWOT analysis, it shows that the strengths possessed take advantage of opportunities to support policies, including aspects of funding, aspects of farmer empowerment, aspects of farmer and investor partnerships and aspects of institutional strengthening of the University of Palangka Raya. According to [22], the management strategy applied to the forestry sector includes resources, activities, outputs, organizations and institutions together as a system. Determination of directions using the weighting method where the value obtained for the weighting comes from a questionnaire filled out by the policy makers.

Indicators of Farmer Group Institutional Funding Support, Licensing Investment, Quality and quantity of extension agents, Utilization of available land potential [13]. Determination of strategic priorities is obtained based on the results of the analysis where the weighting value is obtained from the results of the questionnaires of the parties based on aspects of funding, aspects of empowering farmer groups, aspects of farmer and investor partnerships, aspects of institutional strengthening of the University of Palangka Raya.

Based on this description, internal (strengths and weaknesses) and external (opportunities and threats) factors can be identified, in the form of:

Strengths (Strengths) include such as: a. The high value of ecological and aesthetic potential because the Hampangen Educational Forest has a biodiversity that is not found elsewhere and has extraordinary beauty; b. Establishment of cooperation with partners such as research and development (R&D) institutions, Palangka Raya University, and stakeholders who are made institutional partners to support the development of Educational Forests both in terms of research, development, socialization as well as funding and management support; c. Local government policies on conservation are supported by laws and regulations at the national level regarding the conservation of living nature and its ecosystems; then elaborated in local government policies by the relevant agencies; 2. Weaknesses include: a. The number and quality of human resources have not disclosed their concern and linkages to take part in caring for potential control so that it can be used optimally by the surrounding community; b. Limited sources of funds because allocations from both the central and regional governments have not yet been made because they are still in the planning stages; c. Inadequate facilities and infrastructure in the form of the availability of facilities and services that do not yet exist or are still very minimal such as signposts, information places, potential data and information cannot be accessed, where it is still difficult to obtain detailed information about the potential of the Hampangen Educational Forest for promotion tourism and natural research research sites; 3. Opportunities include: a. There is community support in the form of understanding, perception and desire to participate in ecotourism development in the Hampangen Educational Forest area as well as support from other stakeholders such as Research and Development, Non-Governmental Organizations, Universities, and donor agencies; b. Opportunity to increase the Regional Budget originating from taxes and fees originating from ecotourism activities for the local government; c. Public interest has started to exist; d. Tourism Office Program to introduce local community culture; e. Willingness of partners to assist in marketing through exhibitions, seminar forums and through travel agents at local, national and international levels; 4. Threats include a. Forest degradation which causes the quality and attractiveness of tourism objects to decrease as a result of various human activities that are negative to the natural surroundings; b. The economic crisis has affected people's income, so that forest resources have become a place for exploitation to meet people's needs; c. Community understanding of ecotourism is still very low but without reducing their support for the development of ecotourism; d. The accessibility of the road leading to the location of the area is still inadequate, due to the lack of availability of transportation facilities and the condition of the roads that are partly unfavorable.

4 Conclusion

Based on the research results, it can be concluded that the Potential of Hampangen Educational Forest can be developed through the Forestry Business Group program including: Agroforestry, Timber Forest Products, Ecotourism and Environmental Services, Mushroom Cultivation, Honey Bees, and Rattan Crafts. The development strategy is in quadrant IV (X= -1.37; Y= -0.27) defensive strategy which means that it must minimize its weaknesses and avoid external threats by establishing cooperation and partnerships with investors. maximize the role of Palangka Raya University by involving more cross-sectoral or related stakeholders to improve facilities and infrastructure for tourism forest development and natural forest research.

Compliance with ethical standards

Disclosure of conflict of interest

The author has stated that there are no competing interests. Statements of informed consent from the University of Palangka Raya and the Hampangen Educational Forest Management Unit approved this research. The objectives and procedures in the research were appropriate and information regarding the data was obtained directly from the community around the Hampangen Educational Forest.

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