

Analysis Of Ecotourism Income Organic Vegetables On Agroforestri Land Of Kidul Pujon Village Kecamatan Pujon, Malang District

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Abstract: The purposes of this study is to determine the increase and development of income through organic vegetable ecotourism on agroforestry land. This research was conducted in Pujon Kidul Village, Tulungrejo Hamlet in June - October 2018. The approach taken is participatory rural assessment, modification of Participatory Rural Appraisal / PRA in agroforestry farmers. The technique of determining respondents in this study uses purposive sampling. Intensive results of agroforestry (agrisilviculture) analysis, average agroforestry farmer income from carrot vegetable crops reached Rp.5568,750, - / harvest, large red chili reached Rp.6,160,000, - / harvest, cabbage reached Rp.2,220,000, - / harvest, mustard reached Rp. 3,077,778, - / harvest, shallot reached Rp. 8,350,000 / harvest, leek onion reached Rp 2,258,333, - / harvest, cayenne reached Rp 9,833,333, - / harvest, brongkoli reached Rp. 4,800,000, - / harvest, and eggplant reach Rp. 195,238, - / harvest. The average farmer income for agroforestry received revenue reaching Rp. 13,603,488, with total costs reaching Rp. 4,468,247, and the average profit reached Rp. 935,242. B / C Ratio value of 3.34. With these average profits, farmers have the potential in terms of economic improvement for forest farmers to live well. The production of Perhutani gum has an average land area of 10.5 ha. From that area it produces sap 267.1 Kg / Ha. The average income from the sale of sap reaches Rp 801.257, - / Ha. The existing stands are *P. merksuii* with an average diameter of 15.35 cm, average stand height of 15.35 meters, and the average number of stands per hectare as many as 403.95 trees. Farmers need to increase existing land intensification by paying attention to the level of development of agroforestry land so that it can provide optimum ecological and economic impacts to the community.

Keyword: Ecotourism, agroforestry, organik, analysis, participatory

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I. Introduction

1.1 Background

It is widely known that tour packages with the concept of "eco" or "green" have become a trend in the tourist market lately. The concept of "returning to nature" tends to be chosen by most consumers who begin to care about conservation measures and the desire to participate in the tourist destination they visit, one of which is organic vegetable picking on agro-forestry land. Organic vegetables are chosen because they are healthy, safe, and environmentally friendly supporting the development of agricultural-based tourist villages. Ecotourism must also contain elements of pleasure from the objects visited (Fitriani, 2008). Therefore, the existing products and services of tourism must also provide an element of pleasure to be worth selling and accepted by the market. The economy of ecotourism also opens economic opportunities for agro-forestry farmers (Isnain, 2016). Tourist attractions and other tourism products that offer the concept of returning to nature are increasingly in demand by the market (Yusnitha, 2017). Ecotourism must have its own policies and programs related to environmental preservation, local culture and benefits to local communities (Linberg, 1995). Tourist products sold mostly embed the word "eco" or "back to nature" only as a label to attract consumers, but not accompanied in the spirit of preserving or involving the local community in these tourism products. A model related to the forestry sector with agricultural crops, plantations, livestock or fisheries inside or outside forest areas as a form of agro-forestry. Agro-forestry systems are related to social, economic and environmental, but are more focused on the sustainable side of profit (Michon et al. 1999; Affandi, 2011). Agro-forestry is expected to meet global demand for food and energy in the future, while also needing to ensure that agricultural expansion will not threaten forest lands (Godfray et al, 2010 and Arvor, 2012). Furthermore Linn explained that "in general there is a large amount of work with the principles and methods for scaling up agricultural changes with the emerging focus on

micro-social systems in agricultural innovation" (Linn, 2012). According to Pretty et al (2013) and Jackson et al (2013) that "scaling up agro-forestry has led to various demands effective for, so many people benefit".

1.2 Research Problem

The pattern of forest land that used for agro-forestry is highly depending on the level of development of agro-forestry and the social character of the community. In agro-forestry with an initial level of development where more than 50% of annual crops will able to provide effective fields. If the growth of staple plants has reached the middle and advanced, then the space for annual crops will decrease along with the increasing size of the staple plants. At each level of development of agro-forestry will contribute differently to land use, cultivation techniques applied and productivity. The difference in productivity will have an impact on people's economic differences.

1.3 Research purposes

The research objective was to determine the pattern of developing organic vegetable ecotourism on agro-forestry land in increasing farmers' income in *Pujon Kidul* Village, *Pujon* District, Malang Regency continuously.

II. Material And Methods

2.1 Research period and place

The study was conducted in *Pujon Kidul* Village, *Pujon* District, Malang Regency, East Java starting in June - October 2018.

2.2 Research methods

This study uses the Participatory Rural Appraisal (PRA) method in which PRA, as an approach method in the process of empowerment and increasing community participation (Chambers, 1996). The data collection technique is done by observation, interview, questionnaire tabulation and literature study. Determination of respondents is done by purposive sampling technique.

2.3 Agro-forestry Farming Income Analysis

Qualitative and quantitative descriptive analysis used with the help of Microsoft Office Excel application. The advantages of agro-forestry business are the difference between the amount of revenue and the amount of costs incurred in the agro-forestry process (Soekartawi, 1995), so the formulas used are:

$$\pi = TR - TC$$

Where:

π = Profit

TR = Total revenue

TC = Total cost

Revenue (revenue) is a multiplication between production obtained from a farming activity with a selling price (price), so the formula used is:

$$TR = \sum Y_i . P_{yi} - \sum X_i . P_{xi}$$

Where:

T = Total revenue

Y_i = Amount of production produced by farmers

P_{y_i} = Price of agricultural produce

X_i = Number of farmers' needs

P_{x_i} = Cost / price requirement

Cost as a variable cost of farmers during an agro-forestry business, while fixed costs are not taken into account, because agro-forestry land belongs to *Perhutani* (Indonesian State Forestry Company). Variable costs consist of production facilities and labor costs. Costs for production facilities include fertilizer costs, drug costs and other costs. The B/C ratio analysis is the ratio between total revenue (TR) and the total production cost (TC) which is formulated in the following equation:

$$B/C = \frac{TR}{TC}$$

Where:

TR = Total revenue

TC = Total Cost

If the B/C ratio is > 1, the agro-forestry business is profitable. If B/C ratio = 1, the agro-forestry business breaks even, whereas if B/C ratio < 1 agro-forestry is not profitable so it is not efficient.

III. Result

3.1 General Conditions of Research Location

The administrative location is located in *Pujon Kidul* Village, *Pujon* District, Malang Regency. *Pujon Kidul* village has 3 hamlets; there are the hamlets of *Maron*, *Tulungrejo* and *Krajan*. The area of *Pujon Kidul* Village is 27 Km² in the West bordered by *Sukomulyo* Village, East of *Pandesari* Village, South of *Perhutani* Forest, North of *Pujon Lor* Village.

Respondents Age and Land Area

Based on information from the chairman of the *Rukun Warga* (RW), the number of farmers in *Pujon Kidul* village is = 3028 people. Respondents were taken as many as 79 people. Age of agro-forestry owners and land area are seen in Tables 1 and 2

Tabel 1 : Respondent Age			Tabel 2 : Respondent Area		
Age Category	Total Population (Person)	Persentage (%)	Respondent Area	Total (person)	Persentage (%)
< 35	8	10,03	> 0,2	13	16,81
35 – 45	21	26,22	0,25 - 0,5	36	46,04
45 – 55	30	37,64	> 0,5	29	37,15
55 – 65	19	23,46	Total	79	100
>65	2	2,63			
Total	79	100			

Source: Primary Data Processing 2018

3.2 Agro-forestry Management

Lately, tour packages with the concept of "eco" or "green" have become a trend in the tourist market. The concept of "return to nature" tends to be chosen by most consumers who are starting to care about conservation measures. The principle of sustainability in ecotourism carried out does not cause damage and pollution of the environment and culture of the local community (Nair, 1987; Doubenmire, 1959). Cultivation of land and management of domestic animals began to develop by combining trees with livestock to create forest conservation (Penman et al, 2003; Burgess et al, 2005; Gibreel, 2013). Ecotourism also opens up economic opportunities for the community even more so if tourism trips are carried out using local resources. Revenue from ecotourism can be used for conservation activities at the local level, so that it can continue. Sustainable ecotourism must pay attention to the balance of nature, environment, culture and economy in order to continue (Prayoga, 2013).

3.3 Organic Vegetables Picking

Organic vegetables such as Carrot, broccoli, cabbage and eggplant Plants were picked every 3 months, while Red chili Pepper and cayenne are picked once a week. Tourists can pick vegetables directly following the farmer by paying for an entrance ticket, if they wish to bring home vegetables, simply replace the price below the market price. Several types of vegetables are presented in Table 2 and Figure 1.

Table 2: Vegetable crops in agro-forestry

Agricultural Crops Types	Amount of Farmer	Production Kg/Ha	Income in a year (Rp)
Carrot (<i>Daucus carota</i>)	24	1856	Rp 16.706.250,-
Red Chili Pepper (<i>Capsicum annum var grossum</i>)	10	1540	Rp 18.480.000,-
Cabbage (<i>Brassica oleraceae</i>)	5	1480	Rp 6.660.000,-
Mustard (<i>Brassica campestris</i>)	9	1539	Rp 9.233.334,-
Shallot (<i>Allium ascalonicum</i>)	12	1392	Rp 25.050.000,-
Leek (<i>Allium porrum</i>)	12	1129	Rp 6.774.999,-
Cayenne Pepper (<i>Capsicum frutescens</i>)	18	1639	Rp 29.499.999,-
Broccoli (<i>Brassica oleracea var italica</i>)	8	1600	Rp 14.400.000,-
Eggplant (<i>Solanum melongenae</i>)	6	1367	Rp 4.100.001,-

Source: Primary Data Processing 2018



Figure 1: Agricultural crops planted by farmers

Based on the results of research in this village, the practice of agro-forestry has several advantages. In the agro-forestry pattern in this village there are components of forestry plants with components of agricultural crops. The combination of these patterns includes forestry (pine) components and agricultural components such as carrots, broccoli, chili, eggplant, and mustard. According to Widiyanto et al. (2010), farmers in choosing the types of plants cultivated are not through careful planning, but depend on the availability of production inputs. Furthermore, agro-forestry or intercropping patterns of communities have used vacant land within forest areas (agro-forestry) to grow secondary and annual crops. (Irwanto, 2008 and Gilang, 2011).

3.4 Business Income of Agro-forestry

Income analysis uses the assumptions of agricultural crop production, the amount of revenue, the amount of expenditure and benefits received by farmers in agro-forestry all purely based on the results of interviews. Cost analysis includes calculation of variable costs consisting of costs of production facilities and labor. Costs for production facilities include the costs of seeds, fertilizers, fungicides / pesticides and other costs, while fixed costs such as land purchase costs are not taken into account, this is done because the land used by farmers is forest land that is not traded and does not despise. In this case the farmers only use the land with the obligation to participate in the realization of the development of basic forestry plants.

In *Tulungrejo* Hamlet, *Perhutani* has 5 plots of land that are used to harvest sap from pine stands. The average land area reaches 10.5 ha. The collection of pine sap is carried out every 15 days by officers and workers with a total collection of approximately 24 times each year. From a month the sap production productivity reaches 267.1 Kg / Ha, with the selling price of Rp.3000,-/Kg, *Perhutani* earns an average income of Rp. 801.257,-/Ha. Within a year it can produce 3205 Kg / Ha of pine sap with income reaching Rp. 9,615,085.

Based on the results of the analysis of vegetation measurement data, the condition of stand growth grew relatively well. Measures of stand dimensions especially stand height and number of trees per hectare.

The existing stands are *P. merksuii* with an average diameter of 15.35 cm, average stand height of 15.35 meters, and the average number of stands per hectare as many as 403.95 trees. The stand is only taken from the sap for logging which has not yet been done. If the stand will be cut, the *Perhutani* will earn around Rp. 500,000/m³.

Based on the analysis using data from interviews with farmers it is known that the average agro-forestry business income reaches Rp 40,810,465,-/ year with an average total cost of Rp 12,204,740, - / year and the average profit reaches Rp 28,605,726,-/year. Economically this activity is profitable because the value of B / C Ratio reaches 3.34 or more than 1. With the average profits obtained will be able to provide potential in terms of economic improvement for forest farmers to live properly. Sustainability of farmers' income from the implementation of agro-forestry provides security and social and economic security for the community in the village of *Pujon Kidul*.

For *Perhutani*, the pattern of agro-forestry is one of the forest land management systems with the aim of reducing forest destruction / encroachment activities while simultaneously increasing farmers' income (Hairiah et al., 2010; de Foresta et al., 2000). Opportunities for the use of agro-forestry systems in land management are also caused due (Sabarnurdin, 2002), agro-forestry is a biological method for conservation and maintenance of land cover while providing an opportunity to connect soil conservation with water conservation (Costanza, 2000). In agro-forestry systems there are ecological and economic interactions between different components. Agro-forestry is aimed at maximizing the use of solar energy, minimizing the loss of nutrients in

the system, optimizing the efficiency of water use and minimizing runoff and erosion (Mulyono, 1998; Mayrowani, and Ashari. 2011; Triwanto, 2013).

In reality, farmers do not have a single share of land, but a few plots of land are at different levels of agro-forestry. For the future farmers are expected to be able to increase existing land intensification by paying attention to the level of development of their agro-forestry lands so that agro-forestry businesses are able to provide ecologically positive impacts and optimum economic benefits (de Foresta et al, 2000; Penman et al. 2003; Delgado et al, 2012).

Large fields of agro-forestry cultivation do not guarantee large profits for farmers. This is because farmers need high production costs for processing and maintaining agricultural crops in the form of vegetables, so that the benefits obtained by farmers are relatively small compared to land using agro-forestry systems. The existence of agricultural land can provide great economic, social and environmental benefits (Costanza, 2000; Fagerholm et al 2016 and Fanani, 2017). Agro-forestry, as part of a multifunctional work landscape, can play a major role in preserving and even enhancing biodiversity from farms to landscape levels in both the tropics and subtropics. Agro-forestry systems maintain high flora and fauna diversity (Jose, 2012). Agro-forestry is also recognized as a land use practice capable of producing biomass for bio-power and bio-fuels, very little information is available on this topic. Agro-forestry has contributed to supporting an important role in maintaining climate balance, alternative food sources, diversity conservation and protection of important water source protection areas. The principle of sustainable agro-forestry is to integrate various types of short, medium and long-term plants. (Mosquera, 2010 and 2012; Triwanto, 2015).

IV. Conclusion

4.1 Conclusion

1. In the pattern of planting in *Pujon Kidul* village covering an area of 52.5 hectares, there is a component of forestry plants with components of agricultural crops. The combination of these patterns includes forestry components such as pine and agricultural components such as chili, carrot, broccoli, beans, eggplant, and mustard.
2. The average agroforestry farmers' income in once in *Tulungrejo* hamlet on carrot crops reached Rp.5568,750,-/harvest, red chillies pepper reached Rp.6,160,000,-/harvest, saplings reached Rp.2,220,000,-/harvest, mustard greens reaching Rp 3,077,778,-/harvest, shallots reached Rp 8,350,000 / harvest, pre-onions reached Rp 2,258,333,-/harvest, cayenne reached Rp 9,833,333,-/harvest, broccoli reached Rp 4,800.000,-/harvest, and eggplant reach Rp. 1,366,667,-/harvest.
3. Average Land area owned by *Perhutani* in *Tulungrejo* Hamlet reaches 10.5 hectares with a total area of 52.5 hectares. In taking sap of 24 times with a total productivity of 3205 Kg. The annual sales of sap reached Rp 9,651,086Kg/ Year.
4. *Pinus merkusii* stands are existing stands. With an average height of 15.35 m, a diameter of 0.29, and an average volume of 4166.77. In one Ha the number of pine concentrations reaches 403.95.

4.2 Suggestions

Farmers need to increase land intensification by taking into account the level of development of agro-forestry to have a positive ecological, social and economic impact. It is necessary to inform the forest land management system with the pattern of developing agro-forestry to overcome problems that arise as a result of land conversion and at the same time to overcome the problem of food availability.

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