



## The Perception and Contribution of Community Forest on the Welfare of Farmers in Merapi Volcano's Slope

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### Abstract

Pressure on forest resources causes overexploitation, so that forest resources can't provide optimal benefits. High demands for timber have created opportunity for the development of community forests in Indonesia. The opportunity has been used relatively well by community forest farmers, such as in Cangkringan Sub-District, Sleman Regency. This study was aimed to learn the economic condition of community forest farmers by calculating income balance, expense, welfare, and perception of community forest farmer family. The data of this study was collected using purposive sampling method, with a total of 60 respondents. Secondary data was collected from related government agencies. The research result showed that most community forests use agroforestry system. Sengon, which is the main community of community forest, serves community savings, which is known as "tebangbutuh" system. 51% respondents agreed to the perception of the importance of community forest. Comprehensive calculation produced positive value, which is bigger than 100% for total percentage of income on expense. Using Sajogyo's line of poverty, over  $\frac{3}{4}$  (three fourth) of community forest farmer respondents were above the line of poverty or were able to meet their minimum primary needs.

**Key words :** community forest, perception, income and expense, welfare.

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## INTRODUCTION

Deforestation in Indonesia is highly alarming and has toned down productive forest areas. The damage is resulted from the exploitation of forest resources that pay less attention to the principles of sustainability, just to meet their needs for raw materials for timber industry in Indonesia that keeps increasing (Gerson et al., 2014). The lower stock of wood materials from natural forest areas and the high demand for wood materials result in higher price of wood. Such condition is actually a good opportunity for the development of community forests in Indonesia. Deforestation in Indonesia is highly worrying, and it has reduced productive forest areas. The damage is caused by the exploitation of forest resources which pay less attention to the principles of preservation, just to meet the needs for raw materials for the timber industry in Indonesia that keeps increasing. The lower stock of wood materials from natural forest areas and the high demand for wood materials result in higher price of wood (Ritosuhardoyo, 2009). Such condition is actually a good opportunity for the development of community forests in Indonesia. In addition to meet the demand for wood raw materials, community forest business also plays a role in improving the income of farmers while preserving the environment (Rajati, et al., 2006). The extent to which the community forests play a role in the family economic structure will affect the behavior of the farmers in the forest community business. In this context, the contribution of community forests in household welfare of forest farmers becomes highly interesting matter to study. In order to understand such aspect, it is necessary to investigate the structure of income and expenditure of community forest farmers and its relation with motivation of farmers in this

type of business. Java is densely populated, and land ownership of farmers is relatively small. The majority of the farmers are also vulnerable to pressure in terms of meeting their daily needs. Thereby, the farmer community will be encouraged to utilize their limited land for planting trees and high value dry-season crops.

The majority of community's lives around the forest is included in poor category with income less than 2 USD/ capita/day (The World Bank, 2006; Vedeld, et al., 2012; Scawarze, et al., 2007; Rahut et al., 2015). The utilization of forest resources is not able to contribute significantly to the economy of the family. The forest products obtained only contribute to the family income of 2-20% (Vedeld, et al., 2012). Only 21-30% of the community actually earns the income from forest product sales (Schwarze, et al., 2007). Some problems of community forests in Cangkringan District, Sleman, are: (1) the land ownership is limited despite high number of community, silviculture is not good, high optimization of land so as to eliminate the quality, (2) not all wood products are in good-quality, (3) lower availability of seeds coming from local vendors, (4) unequal understanding, for instance not all of their products are similar, the needs are dissimilar between groups or in groups. In order to overcome the condition, the government issued a policy in the form of community forest management policy, supporting community forest farmers in the form of regulations that facilitate private forest farmers, for example legalization and the strength of wood legality. MPTS (Multi Purpose Three Species) is comprised of 70% of wood, and 30% of non-wood plants, for example avocado plants with cudgel as its additional product, *Michelia* and its flower

products without damaging the trees, durian, mangosteen, ylang-ylang, and stinky beans.

According to Law No. 41, 1999, community forests are forest types all into the category of forest rights. It indicates that the forest community is forest growing on land encumbered with property rights, and not cultivated on the state ground. However, it puts more emphasis on land ownership. The community forest is a forest growing on proprietary land by the minimum area of 0.25 ha, with a crown cover dominated by timber plants (over 50%), or first-year crops which are at least 500. (The Ministerial Decree No. 49 / KPTS-II / 1997). Meanwhile, according to the dictionary of forestry (1990) in Awang (2001), the community forest is forest located on lands under the ownership of the community or the traditional property (customary) continuously cultivated for forestry business, namely wood, either grown naturally or cultivated. Zain (1998) states a small number of community forests in Java in general only covers the area according to forest definition, in which at least 0.25 ha. It is resulted from the average land ownership in Java which is very narrow. The narrowness of land ownership of each family encourages the owners to utilize it optimally. In connection with this, the owners generally try to utilize the land by cultivating high-value crops, fast to harvest, and plants for daily consumption.

In the community forest development efforts to the present day, it can be said that the community forest business is a business that will neither grow big nor die. The community forest business has the following characteristics: (1) the community forest business is done by farmers, middlemen, and industries, where the farmers still have lower bargaining power, (2) the farmers have not

been able to conduct community forest business according to the principles of good business and sustainability, (3) public forests are mostly in the form of mixed cultivation, cultivated with simple ways. (4) Their income from public forests is still positioned as a side income and incidental for farmers, with a range of no more than 10% of total income (Zain, 1998).

Anonymous in Jaffar (1993), states that community forests are comprised of very diverse vegetations. The dominance of any of this type will determine the pattern of the existing community forests. Based on the types dominating the growth space, the community forests can be classified into six patterns: (1) crops pattern; the community forests are dominated by crops, (2) silvopastur pattern; this community forest is dominated by plants producing fodder/ forage, (3) firewood pattern; this community forests are dominated by trees species of which wood producing energy, (4) horticulture pattern; this community forest is dominated by fruit trees. (5) trade/ industrial pattern; this community forest is dominated by wood for trade. (6) wood pattern; this community forest is dominated by wood that can produce utensils materials.

(Djuwadi, 2000; Grace, 2008) state that public forests are similar to other forests of which crops are consisted of trees as the primary type, and therefore its role is not much different: (a) economy: to produce wood and increase small industry in an effort to increase the role of economy network of the people, (b) social: to create jobs, (c) ecology: as a life support of the community in managing water, preventing floods, erosion and as an infrastructure to maintain

the quality of the environment (absorbing CO<sub>2</sub> and O<sub>2</sub> manufacturer), (d) aesthetics: to provide natural beauty, (e) source: as a natural resource for science, biology, environmental science and others.

In accordance with Awang (2001), as seen from the arrangement of its species, there are two models of community forest management: (1) monoculture community forest, mostly is dominated by hard trees only. This type of forest usually doesn't include crops in the community forest, (2) mixed community forest; this community forest is covered with more than one type of plants. In this forest, crops, fruits and vegetables are cultivated (agroforestry).

(Kotler, 2000) describes perception as the process of how someone selects, organizes and interprets information inputs to create meaningful overall description. Meanwhile (Robbins, 2003) describes the perception in relation to the environment, i.e. as a process in which individuals organize and interpret their perception of sense in order to give meaning to their environment. Individuals, in relation to the outside world, always observe to be able to interpret the stimulus received, and the sense used as a connection between the individual and the outside world. To make observation process happen, the object for observation is needed, good sense and the attention are the first step as a preparation to make observations.

(Retno, D., 2001) states that household income is income earned by the entire family members, i.e. husband, wife and children. According to Sayogyo (1982) in Kusumaningtyas (2003), household income can be divided into three groups: (a) income from farming, (b) income that includes rice cultivation activity, and other agricultural activities, (c) income earned from all

activities, including sources of livelihood outside of agriculture. The relationship between physical, economic, strategic, and socio-cultural variables affect welfare variable (Paranata, A., et al., 2012).

Various alternatives can be used to determine the poverty line, including: rice consumption (kg per person), the consumption of nine daily necessities, household spending (IDR per person), the consumption of calories and protein (person/7 days). The poverty line has characteristics: specifications on the three poverty lines, including the conception of "adequacy threshold value", linking the household expenditure level by food adequacy measurement (calories and protein). For the rural life, the classifications are: (1) poor: included poor if the household expenditure is under 320 kg of rice exchange rate/person/year, (2) extremely poor: not enough food, if the expenditure is under 240 kg of rice exchange rate/person/year, (3) the poorest: they can be classified into the poorest if the expenditure is under rice exchange rate of 180 kg/person/year (Sajogyo 1977 in Indaryanti, et al., 2006). Sajogyo in Sitorus et al., (1996) states, the level of household expenditure in villages, the rice exchange rate of 240-320 kg/person/year is called "adequacy threshold", whilst for the city, the figure is amounted to 360-480 kg of rice exchange rate/person/year. The income of rural household is still dominated by agricultural sector.

The role of the services sector (including fixed salary) in Java becomes more prominent, characterizing the increasingly diverse industries in the countryside. The expenditure allocation in the food group turns into a more balanced consumption. With the relatively constant real price of rice, the spending pattern reflects the pattern of

consumption (Sajogyo in Sitorus et al.,1996). Forestry Department (1995) mentions that the successful development of community forest is highly dependent on (1) clear goal of community forests development, (2) the location and unit size of community forests business, (3) the selection of plants, (4) the system of planting, maintenance, and management, (4) planned annual production, (5) the available investment and linkage to wood processing industry.

## RESEARCH METHODS

The study was conducted in the Disaster-Prone Areas (KRB), Cangkringan District, Sleman Regency, Special Region of Yogyakarta. In morphological terms, it is located on the slope of Merapi Volcano, from the peak to foot of the volcano, including villages spread in Cangkringan District, Sleman Regency. Furthermore, the analysis unit used was the village administrative unit, amounted to five villages. In accordance with the allocation of area functions, all of the villages had two area functions, namely protection and cultivation functions. In general, in nature, this research was more descriptive analysis with quantitative approach.

Tools and materials employed during the research were questionnaire, stationery, secondary data, Calculator, Laptop, Software Microsoft Excel 2007, Digital Cameras. Type and source of data; the data collected were in the form of primary and secondary data, as on table 1.

The sampling of respondents employed purposive sampling method. The samples were taken with the intention or

purposes. Someone or something was sampled as the researchers deem that person or something that had the information needed in the study. Community forest farmers becoming the random respondents came from 60 families (KK). The selection of community forest farmers as respondents was based on land ownership of farmers and planting patterns of community forests. The method was taken by considering factors of field conditions, for instance, the slope, distance, weather and time provided in the process of data collection from respondents. In order to support the data analysis, the data collection was conducted using following methods: (a) interview techniques: data collection by conducting direct interview with respondents using questionnaires, (b) recording techniques: recording and collecting secondary data obtained from institutions, (c) literature study: data collection by learning the literature, reports, scientific papers and research which had no correlation with the research. The data analysis was performed with descriptive technique in the form of tables, graphs and pictures. In the analysis, the tabulation was done by grouping the data based on several criteria for the purposes of further analysis, such as respondents' general data, income data, expenditure data and data related to the perception of respondents, such as the role of sengon trees for farmers and motivation of farmers in planting sengon. Several simple quantitative analyses were undertaken to calculate the income and expenditure of community forest farmers. For several methods of calculation, it was performed using formulas.

**Table 1.** Type and Source of Data

No	Data Type	Data classification	Data in details	Data source
1.	Primary data	Respondents' identity data	a. name of respondents b. age c. gender d. education e. total family member f. side job of respondent	Community forest farmers
2.	Primary data	Household economy data	The land area of community forest ownership and private forest ownership Number of teak tree owned The number and type of other than teak trees owned (Mahogany, Sengon, Acacia, etc.). Types of agricultural crops and dry season-crops owned. Income from private forests (from the sale of timber or agricultural crops and dry season-crops) Revenues from non-community forest (husbandry, trade, wages/ salaries, etc.)	Community forest farmers
3.	Primary data	Household economy data	Total income Income source Time frequency	Community forest farmers
4.	Primary data	Household economy data	The cost of daily necessities (clothing, food, health, transportation, entertainment and others) Incidental costs (circumcision, marriage, taxes, etc.). Cost of education household facilities bills (electricity, water, etc.) Source of needs fulfillment and time frequency.	Community forest farmers
5.	Primary data	Farmers' perception data	Farmers' knowledge in planting Sengon on community forest	Community forest farmers
6.	Secondary data	Socio-economic data	Condition of Geographic Location Total population Education Land potential Types of cultivated plants, and others	BAPPEDA, village office, district office, forestry office of Sleman Regency

Source :processed primary and secondary data, 2014

Calculation of Perception Value:

The calculation of perception value was calculated using Likert method. The value of each question was calculated from answers given by the respondents. Each answer option has the value of a (disagree) = 1, b (agree) = 2, c (do not know) = 3. All answers were summed up and calculated to find the average value. After wards, it was grouped, and the formula for calculation is:

$$\% \text{ NM} = \Sigma \text{O} / \Sigma \text{P} \times 100\%$$

*Description:* % NM = Percentage of perception value,  $\Sigma \text{O}$  = The number of people answered according to option,  $\Sigma \text{P}$  = Number of respondents taken in one observation site.

Farmers' Income from Community Forest:

$I_{hr} = \Sigma$  Farmers' income from community forest products

*Description:*  $I_{hr}$  = total income of farmers from community forest per year (IDR), farmers' income from community forest products = income earned from the sales of wood and crops,  $I_{hr} = \Sigma$  Farmers' income from community forest products.

Farmers Income from Non-Community Forests:

$I_{nhr} = \Sigma$  farmer's income from non-community forest products

*Description:*  $I_{nhr} = \Sigma$  Farmers' income from other non-community forests, *Description:*  $I_{nhr}$  = Total income of farmers from non community forest (IDR), income from non-community forest = livestock product, trade, as well as wages or salaries and other sources of income.

Farmers' Total Income:

$$I_{tot} = I_{hr} + I_{nhr}$$

*Description:*  $I_{tot}$  = Total household income of farmers;  $I_{hr}$  = Total income from community forest products;  $I_{nhr}$  = Total

income from non-community forest products.

Calculating Income Per Capita of Community Forest Farmers' Household:

$$I_{pkhr} = I_{tot} / \Sigma \text{AK}$$

*Description:*  $I_{pkhr}$  = income per capita of community forest per year (IDR)  $I_{trthr}$  = total income of household from community forest products  $\Sigma \text{AK}$  = Number of family members

Calculating Income Per Capita of Non-Community Forest:

$$I_{pknhr} = I_{trtnhr} / \Sigma \text{AK}$$

*Description:*  $I_{pknhr}$  = Income per capita per year of non-community forest;  $I_{trtnhr}$  = total household's income from non-community forest;  $\Sigma \text{AK}$  = Number of family members

Income Percentage of Community Forests on Total Income:

$$I_{hr} \% = ( I_{hr} / I_{tot} ) \times 100\%$$

*Description:*  $I_{hr}\%$  = income percentage from community forests;  $I_{hr}$  = Total income from community forests;  $I_{tot}$  = total income from farmers' households.

Calculating Total Expenditure:

$$C_{tot} = \Sigma C$$

*Description:*  $C_{tot}$  = Total household expenditure within one year;  $\Sigma C$  = Total costs incurred to meet the needs.

Calculating Expenditure Per Capita:

$$C_{pk} = C_{tot} / \Sigma \text{AK}$$

*Description:*  $C_{pk}$  = expenditure per capita per year,  $C_{tot}$  = total household expenditure,  $\Sigma \text{AK}$  = number of family members.

Percentage of Total Household Income on Total Expenditure:

$$Itot \% = (Itot / Ctot) \times 100 \%$$

*Description:* Itot% = Percentage of total household income on total expenditure, Itrt = total household income, Crt = total household expenditure

Calculation of Poverty Criteria:

The calculation of the poverty criterion is determined based on the theory of Sajogyo (Sajogyo 1977 in Indaryanti, et al., 2006) using the standard of rice price, consumed at the research sites. The poverty line for rural areas can be classified as follows: (1) If the expenditure of respondents  $\leq 320$  kg x the rice price/person/year, then they are classified poor, (2) If the expenditure  $\leq 240$  kg x the rice price/person/year, then they are classified extremely poor, (3) If the expenditure  $\leq 180$  kg x the rice price/person/year, then they are categorized the poorest.

## RESULTS AND DISCUSSION

### Perception Value

Decision-making of a person in terms of utilizing community forest lands depends on their knowledge of information on various aspects of the environment, and this knowledge will affect the perception and awareness in choosing an appropriate alternative usage (Su Ritohardoyo, 2009). the management and development of community forest products may be backed by knowledge. The knowledge of community forest farmers in terms of management of community forests in Cangkringan especially in sengon business as a commodity to be developed and having a high sale value is presented in Table 2.

The perception in the management of community forests can be seen from the percentage of respondents stating that the community forest is important for the economic, ecologic and social aspects. From

Table 10, it is determined that more than half of the respondents, by 51% out of 60%, agree on the importance of community forests. Especially from the economic aspect, it is very clear that the respondents give a positive response to the existence of community forests. It can be seen in the score percentage of statements 12 and 13.

Disagreement percentage by 9%, indicating there are farmers who pay less or have not paid attention to aspects of community forest management. It is because these respondents also get the benefits of community forests. Nevertheless, some respondents truly feel that the community forest is not more favorable compared to non-community forest.

From the ecology aspect, it can be seen that community forests give positive impacts on the conditions of land, water management, soil and so on. It can be shown from the percentage result of responses to the statements of 4, 5, and 6. The management efforts performed by forest farmers can be seen from the statement 15, stating that the management of community forest in Cangkringan area has been conducted in accordance with the principles of silviculture. Agreeing respondents amounted to 56%, and those disagreeing are amounted to 1%. It shows a high perception of respondents in the conservation effort to community forests in Cangkringan. For the social aspect, it can be seen from the answers of respondents who disagree on the questions 1, 10, 11, 12, 13, 14, 15, 21, and 26. From the entire answers given by the respondents, the respondents managing



community forests can be classified to have considerably high perception in the management and conservation of public forests, especially the benefits to be gained

from the community forests. In addition to be made as savings, community forests' plants can also become an employment for the community of Cangkringan.

**Table 2.** Perception Value

No	Statement	% disagree	% agree	% do not know
1	HR management is the responsibility of all	0	55	5
2	Deforestation affects lives	5	47	8
3	The community can be separated from forests	33	24	3
4	HR is important for environment	0	59	1
5	HR helps water absorption	1	57	2
6	HR helps rehabilitation of critical land	1	53	6
7	HR produces fruits, roots, medicine, and fodder	9	45	6
8	HR provides wood and industrial raw materials	2	52	6
9	HR enhances wood productivity	1	50	9
10	HR of community income level	1	52	7
11	HR income fulfills community's needs	18	41	1
12	HR fulfills community's needs	9	51	0
13	HR is able to improve income	0	60	0
14	HR future assets must be maintained	1	48	11
15	Land conservation is compatible with RTRW	1	56	3
16	Sales of standing tree forest products	16	42	2
17	Sales of log/timber forest product	17	42	1
18	Natural regeneration silviculture	26	30	4
19	Artificial regeneration silviculture	6	51	3
20	Tree seedling from KBR and government aid	4	55	1
21	Institutions are still limited to planting	3	55	2
22	Inventory is used according to life needs	35	23	2
23	Market's best price is done TPA	9	49	2
24	The need for wood legality certification	25	29	6
25	HR gives grace barrier effect	1	59	0
26	The importance of conservation tradition	6	53	1

Source: processed primary data, 2014

**Table 3.** Respondent Age Span

Age indicator (Tahun)	total (people)	Percentage (%)
25-35	3	5.0
36-45	17	28.3
46-55	21	35.0
56-65	19	31.7

Source: processed primary data, 2014

### Characteristics of Community Forest Farmers

The description of the characteristics of community forest farmers was done by interviewing the respondents. The total respondents taken were 60. The data collected included identity data, age, education level, occupation, number of family members, respondents' income, respondents' expenditure, as well as the motivation of respondents towards the management of community forest, especially for management of sengon trees.

### The Age Span of Community Forest Farmers

The youngest age of respondents is 25, with the oldest being 70. The respondents' age data are presented in Table 3.

Table 3 shows that the largest percentage of respondents is in the age group of 46-55 years, equal to 35.0%. It is because in the age span of 46-55 years, the average respondents have raised a family; hence the motivation to work as forest farmers in community forest area is greater, in order to meet the family needs.

### The Education of Community Forest Farmers

The level of education of farmers affects the mindset of farmers in managing

community forests owned as an effort to increase efforts in meeting life needs. In addition, the level of education can be an indicator of a society. The higher a person's education level in social life, the higher the social status in the community. The data of the respondents' education level can be seen in the following table 4.

From Table 4, it can be seen that most respondents (41.7%) are elementary school graduate, followed by 36.7% of high school graduates, 18.3% of secondary school graduates, and 3.3% of university graduates. Low level of education happens because huge costs to attend higher education. The low level of education causes limited ability, there by most effort done to make ends meet is to continue their parents' occupation, i.e. becoming community forest farmers or migrating to other areas to find work. The low level of education also affects the attitudes and knowledge of the person.

### Main Job and Side Job of Cangkringan Community

48 out of 60 respondents have side job in addition to working as a community forest farmers. The majority of the job type is self-employed and farming, with a total of 17 people (28.3%). Data of side job of respondents are presented in Table 5.

**Table 4.** Respondents' Level of Education

Indicator of education level	total (people)	Percentage (%)
No education	0	0
Elementary school	25	41.7
Secondary school	11	18.3
High school	22	36.7
University	2	3.3

Source: processed primary data, 2014

**Table 5.** Types of Respondents' Occupation

Types of Side-job	Total (people)	Percentage (%)
Farming and livestock	2	3.3
Self-employed and livestock	17	28.3
Livestock	1	1.7
Trading and livestock	14	23.3
Trading and livestock	2	3.3
Farming	9	15.0
Paid workers	4	6.7
Trading	2	3.3
Farming and trading	1	1.7
Paid workers and livestock	1	1.7
Others	7	11.7
Total	60	100.0

Source: Processed Primary Data, 2014.

Table 5 shows that the presence of main job and side job can determine the fulfillment of respondents' needs, not only from the community forest business, but also other jobs. It also explains that they have time to spare to do things for increasing the income.

### Respondents' Income

The differences of livelihood will lead to difference in the amount of income on each respondent. This income is calculated within the past year from job income of the respondents, either from the community forest or beyond community forest product. Income from private forests is generated from the sale of wood and dry-season crops on the

land owned by farmers, whilst for non-forest income, it is generated from live stock, trade, wages or salaries, and others. Data of respondent's income can be seen in Table 6.

Table 6 provides the information that the community forest income is divided into income from wood and dry-season crops. Wood yields greater income than dry-season crops. While for income from community forests, it is smaller than that of non-community forest. It is because the majority of respondents work as community forest farmers and they exploit commodity in community forest in order to make ends meet.

**Table 6.** Income of all Respondents 2014

Source of income	total (60 respondents/year)	Average (IDR/respondents/year)	Standard deviation	In average (IDR/capita/year)
Community forest	298.850.000	4.980.833	9.560.783	24.780
Non-community forest	788.390.000	13.139.833	12.090.033	64.411
Total	1.087.240.000	18.120.666,67	14.538.796	88.827

Source: Processed Primary Data, 2014.

The amount of the standard of deviation from household income data of respondents shows that the diversity of the income earned by respondents is high. Actual respondents' income ranges from IDR 2.470.000 to IDR 78.000.000. Nonetheless, for income comparison, standard average income from 60 respondents is taken, which is amounted to IDR 18,120,666/ respondent/ year.

### Respondents' Expenditure

Respondents' expenditure is calculated for all purposes, starting from annual fixed needs, incidental needs, and other needs incurred in 2014. Each of household's needs vary, influenced by the number of family members and type of needs. The respondent's expenditure data are presented in Table 7.

Expenditure for fixed costs incurred annually by all community forest farmers respondents is amounted to IDR 451,151,000/ year, with IDR 7,519,183/ year being the

average number. Mean while, the smallest allocation of household expenditure goes to food. The smallest expenditure allocation is for recreation. The average for fixed costs is derived from the amount of total annual expenditure of respondents' household divided by the total number of respondents. It is so because each respondent's household incurs different cost for similar needs in meeting the annual fixed expenditure.

The calculation result above generates information, i.e. a portion of income earned by respondents goes for savings. It proves that in addition to make ends meet, there is still extra income that can be saved by the respondents, so it plays an important role in terms of savings in the future. It also proves the respondent income from community forests provide greater results to total income. Besides annual fixed costs, respondents' expenses allocated to incidental expenses can be seen in Table 8.

**Table 7.** Respondent's Expenditure for Fixed Annual Fee

Indicator	total (IDR /year)	In average (IDR /year)
Expenditure		
Annual fixed costs		
School	72,596,000.00	1,209,933.33
Electricity	30,080,000.00	501,333.33
Health	40,190,000.00	669,833.33
Clothing	29,550,000.00	492,500.00
Special events	41,250,000.00	687,500.00
Housing	32,040,000.00	534,000.00
Recreation	18,000,000.00	300,000.00
Saving	25,200,000.00	420,000.00
Transport	109,120,000.00	1,818,666.67
Community forest	33,325,000.00	555,416.67
Others	19,800,000.00	330,000.00
Total	451,151,000.00	7,519,183.33

Source: processed primary data, 2014.

**Table 8.** Respondents' expenditure for incidental fee/ special events of 2014

Expenditure indicators	Total	In average (IDR/ total respondents' payment )
Special events/ incidental	41,250,000.00	687,500.00

Source: processed primary data, 2014

Incidental expenses incurred by respondents go to weddings, circumcisions, and others. The expenses take considerable amount and is in urgent time to do so. Donations or assistance of the neighborhood association is given if the neighbors are about to hold an event. The condition of the rural environment and a high sense of family cause the respondents to have a high sense of assistance, both in terms of energy and money when a family or neighbors are about to hold an event.

In contrast with the respondent's expenditure for annual fixed costs, the average incidental cost incurred by respondents is obtained from the total expenditure for each incidental expense, divided by the number of respondent households incurring the expense, not divided by the total number of respondents, as not all respondents incur incidental expenses within one year. The comparison between income

and expenditure for all respondents can be seen in Table 9.

Overall expenditure of the annual expenditure and incidental expenditure is IDR 451,151,000.00, and the average household expenditure for each respondent for one year is IDR 7,519,183.33. It shows that if the comparison is made between income and expenditure, it can be seen that the respondents' income is greater than their expenditure. Similarly, the average income is greater than average expenditure per capita. The average total income/capita/year is greater than the average expenditure/capita/year. Total income per capita of IDR 5,329,609/capita/year, whilst the expenditure is amounted to IDR 2,211,524.51/capita/year. Therefore, the average farmers are able to fund their needs, both from community forests products and non-community forest.

**Tabel 9.** Comparison of total income and expenditure of all respondents in 2014

Indicator	Total (IDR/year)	In average (IDR/year)	Amount per capita (IDR/capita/y ear)	Per capita average (IDR/capita/year)
Total income of all respondents	1.087.240.000	18.120.666,67	5.329.609	88.827
Total expenditure of all respondents	451,151,000	7,519,183.33	2,211,524.51	36,858.74

Source: processed primary data, 2014.

### The Contribution of Community Forests on the Income and Expenditure of Respondents

After the calculation of income and expenditure is done, then the contribution of community forests on income and expenditure can also be calculated. The contribution of community forests is divided into contribution of community forest's income generated from wood against total income and expenditure as well as the income contribution of the community forest generated from dry-season crops against total income and expenditure. Moreover, the contribution of community forests can also be calculated (wood, crops, and livestock) against income and expenditure, as well as the contribution of non-community forests against total income and expenditure. The calculation result can be seen in Table 10.

Table 10 explains that non-community forest products only contribute by 72.51% on the income. And for the overall calculation performed, positive value is obtained which is greater than 100% for the percentage of total income on the expenditure. It indicates that respondents' income is sufficient to fulfill their daily needs. The community forest products and non-community forest

contributes greatly on the total of income and the total expenditure.

The increase in average income of the farmers, reduction in poverty, and behavioral/perception changes will lead to increased use of forest resources (Nandini, et al., 2016).

In the opinion of Zain (1998), community forests are only additional income and incidental in nature, approximately not more than 10% of the total income. However, community forests in Cangkringan are perceived to have a highly important role, and can be a useful thing in continuous basis because they provide greater income, more than 10% of total income. A great contribution of community forests in Cangkringan areas gives a positive impact for the economy, ecology and social.

The large percentage of contribution from total community forest income (wood) is because there are respondents managing their community forest land using agroforestry. The agroforestry system on land owned by the respondents is cultivated by planting Sengon stands, hence the sale value is high, and it gives major contribution to total income and total expenditure.

**Table 10.** Percentage of community forest and non-community forest contribution on income and expenditure of respondents of 2014

Indicator	Percentage of contribution
Percentage of total income of non-community forest on total income (%)	72.51
Percentage of total income of community forest on total expenditure (%)	27.48
Percentage of total income of non-community forest on total expenditure (%)	91.74
Percentage of total income on total expenditure	126.51

Source: processed primary data, 2014

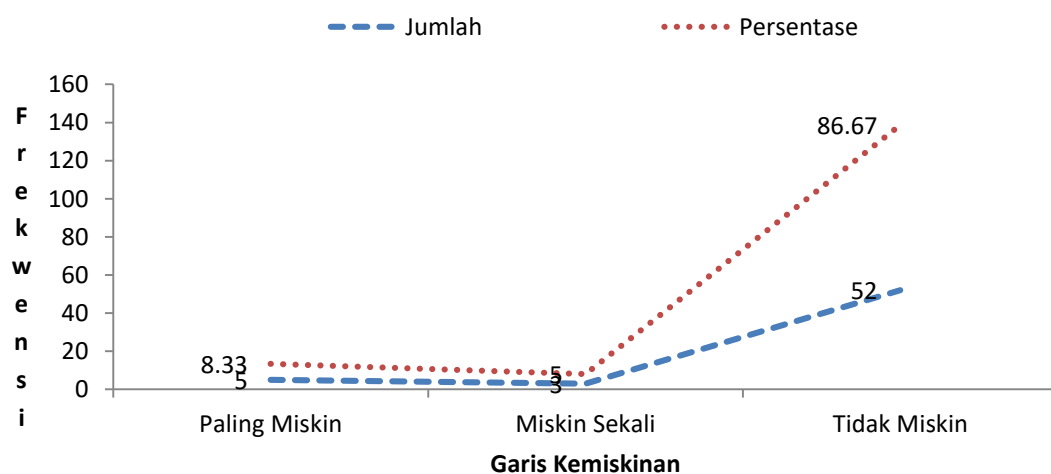
**The Concept of Poverty Line and Welfare Measurement of Respondents**

After finding out the great contribution of community forests, the level of poverty among respondents in the area of Cangkringan can also be calculated. The poverty level is calculated to determine the level of welfare of the respondents. The community is not certainly said to be fully liberated from poverty and prosperous if their income cannot meet the minimum needs. There are many influential factors (Paranata, et al., 2012). Sajogyo (1977) in Indaryanti, et al., (2006) states the concept of poor or non-poor is not only free from the threat of survival of physically/biologically only, but the capability to live and function as a member of community in the local environment. At the research site, an example of the concept application of the non-poor is the ability to meet food needs, having extra money to save, and if there are neighbors who are about to hold events (celebration/anniversary), then other people should donate to financially help the events.

The poverty measurement using decent living concept relatively changes from time to

time. Measurement of material poverty based on income or expenditure (the purchasing power of people or households). In terms of the social aspect, poverty is a weakness characteristic of the community to develop. Poverty is associated with narrow aspiration, and the short insights into the future among the people. Poverty can be classified into two categories, namely natural poverty category and selective category. Natural Poverty is caused by the quality of natural resources and human resources so that the production opportunity is relatively small, or if the production can be done in general but only in relatively low level of efficiency.

In this research, the poverty level of a person is calculated using standard poverty measurement according to Prof. Dr. Sajogyo. The poverty line includes the conception of the threshold value covering food sufficiency, and linking household expenditure level to the food sufficiency measurement (calories and protein). (Sajogyo 1977 in Indaryanti, et al., 2006).The calculation data from poverty line in order to determine the welfare of the respondents are presented in Figure 1.:



**Figure 1.** Graph of poverty line in total and in percentage

Source : Sajogyo 1977 in Indaryanti, et al., 2006

Those included in the category of not poor are 52 out of 60 respondents, or by 86.67%. The calculation and grouping comes from calculation of income per capita of each respondent's household, compared with the rice price per kilogram, consumed by the respondents. The rice price consumed by respondents is IDR 8500.00/kg, Ir64 rice type.

The calculation result obtained is based on the standard poverty line by Sajogyo, if the household spending > 320 kg of the exchange rate of rice/person/year, or in the case of Cangkringan > 320 kg x IDR 8500.00 = IDR 2,720,000, then the respondents can be categorized not poor. Poor category is imposed if the household expenses is ≤ 320 kg or ≤ IDR 2,720,000.

For the category of extremely poor ≤ 240 kg of rice exchange rate/person/year or ≤ 240 kg x IDR 8,500.00 = IDR 2,040,000. For the poorest category ≤ 180 kg of rice/person/year or ≤ 180 kg x IDR 8,500.00 = IDR 1,530,000. From the calculation, most respondents or  $\frac{3}{4}$  of the respondents live in the layer of food sufficiency threshold. Households in this layer are able to achieve the minimum requirement of food (Figure 1). The graph above also shows the significant reduction in the number of respondents who are not poor until the poorest respondents. It indicates that the community condition is included in good category, in terms of the fulfillment of needs, as they have been able to afford their household needs.

## CONCLUSION

From the description above, it can be concluded that: (1) income from community forests is IDR 298,850,000/year, whilst income from non-community forest is IDR 788,390,000/year. The average total income of respondents is IDR 18,120,666/capita/year, whilst the total average income per capita is

IDR 88,827/capita/year; (2) Varying household expenditure of the farmers: in overall, the average expenditure of farmers' households in one year is IDR 451,151,000.00/year, and for average per capita expenditure is IDR 7,519,183.33/capita/year; (3) by using the criteria or the concept of poverty line by Sajogyo, it can be concluded that there are 52 respondents from 60 respondents, or by 86.67% is above the poverty line; there by, it can be said that mostly falls in the category of prosperous, as their income has already met the minimum physical requirements; (4) from the overall calculation conducted: the positive value, i.e. the value greater than 100% for the percentage of total income on the expenditure, is found. It indicates that respondents' income is sufficient to fund their daily needs. The community forest and non-community forest products make a major contribution to the total income and the total expenditure, (5) the perception of community forest management in Cangkringan is included in good category, because more than half of respondents (51%) agree that community forests have crucial role, either from the economic, ecological and social aspects. Perception of community forest management appears not good enough, as seen from the statements 16, 17, 18, 19, 22, 23, and 24.

The suggestions given to this research are: (1) the need for improvement in production, control to market information, business scale, product distribution from community forests, and the quality of human resources of the farmers in the commodity management in community forest, as the community forests in the area of Cangkringan provide great benefits to the income of forest farmers, and will eventually give added-value to the welfare of farmer families; (2) forest



farmers must improve motivation in managing and preserving community forests so as to create sustainable community forests; (3) the need for information system of community forest management to improve the knowledge, where the knowledge will influence the perception and awareness in selecting a suitable alternative.

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