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Economic impact of community forest management on farmers: an Indonesian perspective

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Abstract: This study conducted a profit analysis to understand the economic impact of community forest management on farmers in Bulukumba Regency, South Sulawesi, Indonesia. The study results showed that a farmers' income sourced from the community forest about IDR 13.581.750 and non-community forest about IDR 1.100.000 where community forest contributed more to a total income than non-community forest. According to the outcome, it is found that income from community forest and non-community forest contributed to the farmers' financial gain per person about IDR 14.681.750 a year to maintain the living condition and get rid of the poverty line. However, there are several disputes on policies are existed those are affecting the community forest to be managed in the South Sulawesi. To overcome the existing disputes and problems, there is a need for revision on the existing provisions to improve the community management system further to assist farmer. This study presented several recommendations on the community forest to be managed correctly in the South Sulawesi as an Indonesian perspective.

Keywords: community forest management; Kajang; Bulukumba; farmer; poverty; Indonesia.

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1   Introduction

Forest is a national wealth in Indonesia that should be kept for the good of the people (Nanang and Inoue, 2000). Many studies referred to the forest, provincial disputes, problems, bureaucracy and related wealth issues for the stakeholders in many Indonesian perspectives (Sloan and Sayer, 2015; Kubo, 2010; Wunder, 2005; Armitage, 2002; Garrity and Gintings, 2001; Nanang and Inoue, 2000). A study by Bradshaw et al. (2015) indicates that the more benefits are to be taken from the forest, the more prosperous will be in the country and more the people live out of poverty. A good number of references are referred to as the issue in the last two-three decades with provincial disputes, centralisation and bureaucracy (Colfer, 2010). There are about 70% of the national territory of Indonesia is declared as a state forest which is defined as a specific provision (Susanti and Maryudi, 2016). On the other hand, the forestry sector also plays an important role in the national economy and helps individuals to live out of poverty margin (Kurniawan and Managi, 2018). Considering those, Indonesian forest is deliberated as wealth and forestry can play an important role in various aspects of social life, development and community environment (De Royer et al., 2018). Forest also plays as an important renewable natural resource which provides the direct and indirect benefit to the society (Ranjit, 2011).

For centuries, forests have served as a kind of natural safety net for communities during famine or other events that generally impact agricultural and agro production (The World Bank, 2013). According to the evidence found recently in Indonesia, there are many unproductive lands exists because of wrong land management, poor management by a few company ownership and poor management by wealthy individuals (Takahiro,

2019; Kurniawan and Managi, 2018). The increasing population in Indonesia are causing the pressure on forests management, conservation, recycling ecosystem and the supply of wood from natural forests is not enough to meet human needs. The impact of the community forest is taken place in Rinjani protected area is due to behaviour change of the local community (Nandini et al., 2016). Thus, it is believed by a few studies that one alternative to solve these problems is the reconstruction of community forests (Baynes et al., 2015; Dasgupta and Beard, 2007; Barr et al., 2006).

Forestry is uniquely positioned to make a major contribution to addressing the problems of environmental degradation and rural poverty, given the multiple roles that it can play in the provision of food, shelter, farming, generation of income and maintenance of the natural resource (Gow, 1992). According to Helms (1998), forests are an actor for an ecosystem is characterised by dense coverings, often consisting characteristics of species composition, structure, age class, and related processes and generally include grasslands, small rivers and wildlife. Those valuable characteristics of the ecosystem have an important role in increasing the community's expectation having a good way of living. The benefit of the forest can be obtained entirely if the functions of the forest management are guaranteed optimally as they should be. The cases of Indonesia are to be the same.

South Sulawesi has a total of 223,428 hectares of the community forest. This area is 17.19% of the total forest area located in Indonesia. The management of community forests in South Sulawesi, especially in the Bulukumba Regency has an advantage for food security through land use pattern (Soma and Kubota, 2018). The influence of land-use change and rainfall on shallow landslide or man-made hazardous activities in the South Sulawesi should be minimised, and the community forest and agroforest systems should be adapted to get the vast potential and as its kind by the routine activities. The earlier related studies have argued the similar collateral land management routine activities (Dinas Kehutanan Provinsi Sulawesi Selatan, 2004). Therefore, it is cleared by Dinas Kehutanan Provinsi Sulawesi Selatan (2004) that the community who lives around the forest should devote their efforts for community forest and agroforest systems and the land management.

Community forest depends on the livelihood activities of the stakeholders such as food sourcing from hunting, collection of wild plants, fishing, household use, food production, small-scale agroforestry arrangements and the ecosystem services (Adriyanti and Setyorini, 2012). Bulukumba community forest is out of ten sub-districts spread along Bulukumba Regency and the forest area is 22,148.04 hectares. Kajang District possessed the widest community forest in Bulukukba Regency with an area of 4,370.54 hectares. The forest in this district is managed by various parties ranging from government, private stakeholders and community individuals (Bahar, 2013). However, a good and functional planned program is essential to get the entire benefit as it should be for the case of Bulukumba Regency. Waluyo et al. (2013) stated that good knowledge about community forest management is a good reference for stakeholders so that the planned program can work. Therefore, to have a well-planned program in managing the forests by all stakeholders should have a good reference point as part of the community forest activities (Rahut et al., 2015). The system of community forest management (e.g., participatory forest management) seeks to initiate the process of eliminating the main causes of the forest depletion through the participation of local communities.

The importance of community management in Indonesia is now increasingly realised (Gurney, 2016). This is due to the awareness of managing forest resource which is not only essential for the financial but also extend to the management of forest resource as a whole (Reksohadiprodjo, 1994). Therefore, it is important to identify and employ activities within existing norms and widen the planned programs within communities in designing devolved commons management models promoting devolved decision-making management. Thus, by having social awareness in managing the forest resource a likely framework to be developed further in the Indonesian case which will influence the sustainability of the forest. Besides, to help to improve the design of the community forest management (CFM), scholars, practitioners and all related stakeholders should anticipate heterogeneity in CFM accord and should work together to the better characterise them with theoretically and empirically (Rasolofoson et al., 2017).

Socio-economic and natural resources interlink in all the practices which should be an important factor for environmental law capacity-building (Chettri et al., 2015). It is shown that socio-economic life and natural resources from the forest-related ecosystem gives a better life for the community. Besides, Suharjito (2004) also argues that community forests can still survive even though their economic contribution is low in general. It is as a result of their role which is not limited to the household economic dimension, but also strongly related to the socio-cultural dimension of society. Community behaviour change along with the increasing of socio-economic factors as a result of land management is important as indicated by Congo by Lescuyer et al. (2019) and found that community forestry is unlikely to be developed unless local people are guaranteed that it will contribute to improving their livelihoods with financial and physical capital.

The recent literature on the community forest management indicates the importance of socioeconomic factors, financial and physical capital, and scale of incomes when examining individual behaviour for community-based management apart from multi-scale mechanisms, self-interested concerns, regulations and material incentives (Gurney, 2016). Unfortunately, self-interested concerns and scale of incomes are less focused in the case of Bulukumba Regency, South Sulawesi, Indonesia. Increased understanding of the factors such as multi-scale mechanisms, self-interested concerns and especially scale of income (e.g., financial) related to participation could facilitate better targeting and encouraging cooperative management and community forest management. With the lacking addressed above, this study disclosed likely recommendations on how the community forest to be managed correctly in the South Sulawesi with the notion of devolved commons management to encourage participation.

2   Research methodology

This study was conducted in Kajang District, Bulukumba Regency. This area is considered as the most extensive community forest area in South Sulawesi, Indonesia. Community farmers/stakeholders are considered as a sample with a total number of 40 respondents in this study who manage the community forest. This study used a profit analysis (PA) to know the income received by farmers/stakeholders in managing the community forest (Adesina and Djato, 1997). Additionally, Sajogyo's criterion of analysis (Firdausy and Tisdell, 1992) is utilised to estimate the contribution of community forest income by household heads and measured the poverty rates.

The modest PA measuring criterion is used to estimate the poverty rate in Kajang District where minimum rice consumption is used by need as 240 kg/person/year (with adjusted rice price by 2012). Following the Sajogyo's criterion, this study used the cost of IDR 7.500,00/kg[1] a year per person to maintain the living condition and the poverty rate is calculated by IDR 1.800.000,00/person a year against IDR 150.000,00/person a month. To better understand the poverty line, 360 kg/capita, 240 kg capita and 180 kg/capita are compared with the household income data in the South Sulawesi (Yuwono and Hilmanto, 2015). The findings are explored in details in the section of results and findings.

Table 1   Sajogyo's criterion in measuring poverty

Based on rice needs/capita	Criterion
360 kg/capita	Not poor > 2.700.000
240 kg/capita	Poor < 1.800.000
180 kg/capita	Very poor < 1.350.000

Source: Yuwono and Hilmanto (2015)

3   Results and findings

3.1   Planting patterns

The estimation of the community forest management system is carried out by planting various types of forestry (crops) combined with plantation crops and annual crops. The broad ownership of community forest land owned by farmers considered as well within the management system implementation as alternatives. The pattern of community forest planting is shown in Table 2.

Table 2   Planting pattern conducted by farmers in Mattoanging Village, Kajang District, Bulukumba Regency

No.	Plant pattern	Total (person)	Percentage (%)
1	Wood + plantation	25	62.5
2	Wood + plantation +seasonal	14	35.0
3	Wood + seasonal	1	02.5
Total		*40*	*100.00*

Source: Data analysis on planting pattern (authors)

According to the respondents, 62.5% of the farmers are involved for wood/timber + plantation activities, 35.0% of the farmers have involved for wood/timer + plantation + seasonal activities and 2.5% of the farmers are involved for wood/timer + seasonal activities. The figures show that farmers in Mattoanging Village, Kajang District, Bulukumba Regency are still dependent on the forestry and plantation sectors.

3.2   Production cost of community forest

The production cost of community forest by the respondent is explored based on the revenue earnings, maintenance of plantation crops, and other factors involved. It is

identified that the revenue earnings of a farm depend on the costs incurred in the production process of the farm. The production cost incurred by small hold forest farmers is the maintenance, labour, and time of plantation that utilised by farmers for the forestry crops. An annual production cost is estimated for farmers by farmer's costs on fertilisation, planting care, pest eradication, land taxes, and other related expenses. More details costing are shown in Table 3.

Table 3   The average production cost of community forest/ha/year in Mattoanging Village, Kajang District, Bulukumba Regency

Types of cost	Total (IDR)
Cost of variable	
Fertiliser	666.000
Pesticide	160.000
Wage of worker	99.500
Permanent cost	
Land tax	54.500
Total cost	974.875

      Source: Data analysis on production cost (authors)

According to the study findings, Table 3 shows that the variable cost incurred by farmers are the costs there are related to plantation crops and seasonal crops, whereas timber plant cost is considered that absorb cost on the fertiliser given to the plantation crops and seasonal crops. The average variable cost is found IDR 918.300 in Kajang District, Bulukumba Regency in a year. Meanwhile, the average fixed cost per farmer is IDR 54.500 and the total production cost incurred by an average is IDR 974.875 per farmer.

3.3   Source of income

The source of the household's income of small-holder forest farmers consists of income both for the community forest and non-community forest-based plans. The estimated sources of income by types of plans are shown in Table 4 and Table 5.

Table 4   Source of farmers' average income from community forest/years in Mattoanging Village, Kajang district, Bulukumba Regency

No.	Types of plants	Income	Percentage (%)
1	Bitti	2.262.000	16.65
2	Mahoni	1.415.000	10.41
3	Teak	159.375	1.17
4	Sengon	3.003.125	22.11
5	White teak	122.000	0.89
6	Cacao	1.310.500	9.64
7	Pepper	4.439.750	32.68
8	Maize	870.000	6.40
Total		*13.581.750*	*100.00*

      Source: Data analysis on farmers' income from community forest (authors)

Table 5 Source of Farmers' Income from Non- community forest/year in Mattoanging Village, Kajang district, Bulukumba Regency

No.	Income source	Average (IDR)	Percentage (%)
1	Pensioners	450.000	40.90
2	Chicken farms	300.000	27.27
3	Goldsmith/mason	200.000	18.18
4	Driver	150.000	13.63
Total		1.100.000	100.00

Source: Data analysis on farmers' income from non-community forest (authors)

According to the study outcomes, Table 4 shows that source of farmers' average income from community forest/years in Mattoanging Village, Kajang District. The revenue is estimated which is coming from pepper plantation (32.68%) by the community forest plantation followed by sengon (22.22%), bitti (16.65%), mahoni (10.41%), cacao (9.64%), maize (6.40%) and teak (1.17%). The average income of household farmers is found per year is IDR 13.581.750. Plantation crops and seasonal crops for farmers' are shown in Table 4 which are found as a source of income to meet daily needs, whereas forestry crops such as timber are used as savings or investments. Following on study outcomes as shown in Table 5, it is found that the receiving forms of farmer's income from non-community forest are by salaries of pensioners, chicken farms, masons, and other sources of incomes. The average revenue from the non-community forest is estimated IDR 1.100.000 per year.

3.4 The contribution of community forests to the household revenue

The source of community forest revenue is estimated to come from the plantation crops and seasonal crops, while the non-community forest revenue is estimated to come from retired civil servants, farms, masons and other sources. The average income from the community forest is IDR 13.581.570 which is estimated 92.50%. This indicated that if the community forest is well managed, the income of small-holder forest farmers can be increased. According to the study findings, it is shown that the contribution of the community forest to the farmers' income in the Mattoanging is still very dependent on the forestry. Table 6 shows that community forest revenues in Bulukumba Regency. However, apart from direct revenue from forestry (e.g., timer related incomes), the community forest revenue also comes from various types of forestry crops that are mixed with plantation and its related species.

Table 6 Average peat land contribution to farmers' income/year in Mattoanging Village, Kajang district, Bulukumba Regency

No.	Details	Value	Contribution to household income (%)
1	Community forest income	13.581.750	92.50
2	Non-community forest income	1.100.000	7.50
	Household income	*14.681.750*	*100.00*

Source: Data analysis on peat land contribution to farmers' income (authors)

3.5   *The impact on household poverty rate*

Table 7 shows that the incomes of the farmers in Mattoanging Village which have been estimated based on Sajogyo's (1982) poverty criterion. The details classification on community forest, e.g., household surety average, income per capita, and finally poverty level standards have been used for the expenditure that is required for Kajang District. It is found that if the forest community is well-established as explained earlier, they would be able to meet the non-poor limit criteria (e.g., minimum requirement of the consumption of rice/food 240 kg/capita/year) to get off from the poverty line. According to the study findings and possible income classifications estimated (Table 7), it is certainly achievable to increase the household income (e.g., >IDR 2.500.000 = minimum wage) to contribute to the poverty alleviation (360 kg/year per person of rice-equivalent) in the sty area by the community forest management mixed systems in the Mattoanging Village.

Table 7   Economic impact of community forest on farmers' poverty level of in Mattoanging Village, Kajang District, Bulukumba Regency

Details	Community forest income	Household income
Community forest	13.581.750	14.681.750
Household surety average	3	3
Income/capita	4.527.250	4.893.916
Poverty level	Not poor	Not poor

Source: Data analysis on economic impact of community forest on farmers (authors)

4   Discussion

This study used PA to understand the economic impact of community forest management on farmers in Bulukumba Regency, South Sulawesi, Indonesia. Additionally, Sajogyo's criterion of analysis (Firdausy and Tisdell, 1992) is used to estimate the of community forest income by household/stakeholder and to assess community poverty rate where minimum rice consumption is used over 240 kg/person a year (with adjusted rice price by 2012). Following on the forestry sector's income, this study estimated the cost of IDR 7.500,00/kg/person[2] a year and IDR 1.800.000,00/person a year to maintain the living condition. The study outcomes showed that the farmers' income from the community forest is about IDR 13.581.750 and non-community forest is about IDR 1.100.000. Thus, the community forest contributed more to the total income than the non-community forest in Bulukumba Regency. However, to overcome the existing problems indicate below, there is a need to improve the community management system in South Sulawesi to help further to the farmers and stakeholders.

There are a number of problems on policies are affecting the community forest to be managed in Bulukumba Regency, South Sulawesi, Indonesia, these are:

1   centralisation

2   regulation

3   provision

4   traditional management

5   function of Forest Management Units (FMU)

6   decentralising and recentralising forces across governmental levels.

Community forest management could be identified as a win-win opportunity for reducing centralisation while improving the welfare of rural communities provided that policies are affecting the community forest are mitigated. However, the mitigation options are not easy to resolve as those are coming generation after generation as a legacy from the Indonesian bureaucratic system. The centralisation strategy, regulation, existing provision, traditional management, function of FMU, and decentralising and recentralising forces across governmental levels must lessen with caring the future of national forestry wealth.

The economic impact of community forest management on farmers explored in this study contribute to the understanding of underlying dynamics of bureaucratic politics in the process of political power reconfigurations of problems on policies are affecting the community forest to be managed in Bulukumba Regency, South Sulawesi. This study used a case study for Regency South Sulawesi though the outcomes will be useful for other communities to manage income to contribute to the production of good quality of forest resources and farmers' income. This study considered several policy recommendations that can be placed which are addressed below:

- Critical political issues on decentralisation policies have to be reshuffled such as way that the exiting provisions may not affect their formal goal, and eventually even support decentralisation efforts.

- The political power of administrative actors across levels of government should be under decentralisation provision.

- Should re-examine both the power relations and process across governmental levels.

- Should re-examine the central government's power on its way to reclaiming its authority for forest management and administration by FMU.

- Central government should monitor closely related to the community forestry programs by provincial forestry programs.

- Should get rid of the community forestry policies from the power struggles between district, provincial and national bureaucracies.

5   Conclusions

This study explored the economic impact of community forest management on farmers for overall in Bulukumba Regency, South Sulawesi as an Indonesian perspective. To have a good understanding on the economic impact of community forest management, a PA tool with Sajogyo's criterion is utilised. This study identified several existing problems to get rid of and especially explored some issues to be overcome for the community forest management system. However, different local communities may have different perceptions in terms of what they consider to be important indicators compared to the other areas or there may be a significantly different perception between the local

community and the timber-related stakeholders, and there may also different perceptions between the urban and field-based community. Thus, those issues should be addressed further to understand better on the economic impact of community forest management on farmers for overall Indonesian perspective.

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Notes

1   US$1 = IDR 14,223.05.

2   US$1 = IDR 14,223.05.