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Review from Reviewer 2: JMHT

2 messages

JMHT [IPB] <jmht@apps.ipb.ac.id>

Mon, Jan 27, 2020 at 10:07 AM

To: Tatan Sukwika <tatan.swk@gmail.com>

Dea Dr. Tatan,
Please login to JMHT and find the review result from reviewer 2.

Good day,
Yovi

--

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Tatan Sukwika <tatan.swk@gmail.com>

Mon, Jan 27, 2020 at 10:17 AM

To: "JMHT [IPB]" <jmht@apps.ipb.ac.id>

Thanks a lot.

[Quoted text hidden]

The screenshot shows a web browser window with the URL <https://journal.ipb.ac.id/index.php/jmht/authorDashboard/submission/28553>. The page is titled "The Institutional of Local Community and Stratification of Land Ownership in Surrounding Community Forests in Bogor" by Tatan Sukwika, Dewi Nurhayati Yusuf, and Ichan Suwandhi. The page is in the "Review" stage of the submission process. A table of "Review Discussions" is visible, showing the following data:

Name	From	Last Reply	Replies	Closed
Review from the reviewer	eyyovi 2020-01-24 06:19 AM	tatan 2020-01-30 04:05 PM	3	<input type="checkbox"/>
[jfm] Editor Decision	eyyovi 2020-01-24 06:34 AM	-	0	<input type="checkbox"/>
Review from Reviewer 2	eyyovi 2020-01-27 03:00 AM	eyyovi 2020-02-12 03:18 AM	3	<input type="checkbox"/>
Copy Editing	eyyovi 2020-02-12 03:25 AM	eyyovi 2020-02-17 06:54 AM	2	<input type="checkbox"/>

The URL at the bottom of the browser is <https://journal.ipb.ac.id/index.php/jmht/submissions>.

Review from the reviewer



Participants

Dr. Efi Yuliatl Yovi (eyyovi)

Dr. Tatan Sukwika (tatan)

Messages

Note

From

Dear Dr. Tatan Sukwika,

eyyovi

We just got a comment from the reviewer. Please log in and find the comment in our website.

2020-01-24 06:19 AM

Thank you

Yovi

 [eyyovi, 28553-89116-1-RV_reviewed1.docx](#)

Dear Dr. Efi Yuliatl Yovi,

tatan

We submit the revised manuscript as requested by the editor. In the section of the script we revised (corrections/additions/deletions), we highlighted with a bright colour (for easy identification). Thank you for understanding.

2020-01-26 05:19 PM

Best regards,

Dr. Tatan Sukwika

 [tatan, \[Revised\] 28553-Transcripts-92890-1-18-20200124.docx](#)

Dear Dr. Tata, thank you for your prompt and quick response. Please write a detailed response to the reviewer as requested.

eyyovi

In the meantime, we are still waiting for another review from the second reviewer.

2020-01-27 01:07 AM

Have a good day

Yovi

Dear Dr. Efi Yuliatl Yovi,

tatan

We attach a Authors 'Responses to 1st Reviewers' Requests. Thank you

2020-01-30 04:05 PM

Best regards,

Dr. Tatan Sukwika

 [tatan, Response to the Reviewer 1.docx](#)

Add Message

Review from Reviewer 2



Participants

Dr. Efi Yuliatl Yovi (eyyovi)

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Messages

Note	From
Dear Dr. Tatan, please find the comments from Reviewer 2.	eyyovi
You have 3 weeks for revision, to catch the March edition (if possible). The due date will be 15 February 2020.	2020-01-27 03:00 AM
Good day,	
Yovi	
eyyovi, 28553-92889-1-5-20200124-REV2.docx	
Dear Dr. Efi Yuliatl Yovi,	tatan
We submit the revised manuscript as requested by the editor. In the section of the script we revised (corrections/additions/deletions), we highlighted with a bright colour (for easy identification). Yellow colour for 1st revision and blue colour for 2nd revision. Thank you for understanding.	2020-01-30 02:45 PM
Best regards,	
Dr. Tatan Sukwika	
tatan, [Revised2] 28553-Other-93015-1-18-20200127.docx	
Dear Dr. Efi Yuliatl Yovi,	tatan
We attach a Authors 'Responses to 2nd Reviewers' Requests. Thank you	2020-01-30 04:51 PM
Best regards,	
Dr. Tatan Sukwika	
tatan, Response to the Reviewer II.docx	
Thanks Dr. Tatan	eyyovi
Efi	2020-02-12 03:18 AM

Add Message

Local Community Attributes and Stratification of Land Ownership in Surrounding Community Forests in Bogor

Abstract

Management of forest resources cannot be separated from the character attributes of the community. In the arena of community forest action, access to forest resources which is a people's livelihood is an important element. The study aimed to analyze the performance of the local community attributes towards community welfare and examine the stratification of community land ownership. This research was carried out in ~~the a~~ qualitative descriptive analysis. The results of the analysis showed that 41.56% of the community forest farming groups classified as land-owners. Based on the strata of land ownership ~~rights~~ showed that 70% in the third strata, which was land-ownership of less than 0.5 ha. This study concluded that the performance of the community attributes in the community forest area was relatively low because not effective in regulating community behaviour. These indicated by the low performance achieved on the welfare of the community, the low ownership of the area of arable land, the level of welfare of the local community falls into the category of poor, and low community education.

Keywords: community attributes, community forests, land stratification, qualitative-descriptive analysis

Introduction

The community forest is one of the resources that provide great benefits for human welfare, both directly and indirectly benefits. Direct benefits such as the provision of wood, supporting the availability of food and beverage ingredients, medicinal ingredients, and animals. Indirect benefits of community forests such as the benefits of protection and regulation of water management, facilities for handling critical land, land conservation, forest protection, and prevention of erosion. The benefits mentioned above can be optimal if aspects of the availability of land around community forests in their management can provide a positive influence on welfare (social and economic) and environment (ecology) in a sustainable manner.

The form of cooperation in managing forest resources cannot be separated from the character attributes of the community itself. In fact, in the arena of community forest action, access to forest resources is considered a source of community livelihood (Sukwika et al., 2018) and is an important element in creating group collaboration (Ratner et al., 2013; Sukwika, 2018a). Ostrom (2005) stated that some communities that influence the arena of action include: (1) behavioral values recognized by the community; (2) the level of homogeneity of people's life preferences; and (3) the size and composition of the community.

Commented [A1]: State percisely the location. Is it in Perhutani?

Commented [A2]: State is this in state forest area or private area?

Commented [A3]: The purposes?

Commented [A4]: State the focused method to answer your perposes? This was not focused between the wide of land , cultivation, and the policy???

Commented [A5]: Community attributes produce performance? Community attributes describe the characteristics of the community like welfare of the community, ownership of the area of arable land, the level of welfare of the local community, and community education, etc?

Commented [A6]: spices?

Commented [A7]: herbal medicine?

Commented [A8]: protecting and regulating water flow?

Commented [A9]: ???

46 The pattern of land tenure in community forests consists of three patterns, namely
47 individual land, family-owned land, and leased land. (1) Individual land is a land that is
48 legally the property of one person, and at the same time, the person concerned manages the
49 land. (2) Family-owned land is land in one stretch, derived from the legacy of deceased
50 parents, but has not been distributed to each of the heirs (children). For the land, they
51 usually manage and use the land together or take turns. If the land wants to be sold, all
52 heirs must approve it. (3) A rental land is a person who uses or rent a plot of land oriented
53 to an economic approach.

54 In community forests, there are various initiatives, forms and management systems.
55 Based on its management initiatives, there were three initiators of community forest
56 development, namely: landowners, the government and the private sector. Community
57 forests built at the initiative of land-owners were found in Bogor. The owner takes the
58 initiative to plant his land with the type of annual plant for the purpose of utilizing the
59 product or as a source of income for his family. In the community forest model such as this
60 aspect of species selection, capital development and technology input depends entirely on
61 the desire, level of knowledge, capital ownership and the environment that influences it.
62 According to Suharti (2001), environmental factors such as the success of others in
63 developing a commodity become the reasons often raised by community forest farmers in
64 choosing the type of plant.

65 The community forest model in Bogor is a traditional community forest, which is
66 developed from generation to generation by several community groups. Its main
67 characteristic is management with agroforestry patterns and minimal technological input.
68 This is in line with the results of a study by Sukwika et al. (2016) and Sukwika (2018a)
69 which stated that community forest management in Bogor was still traditionally carried out
70 by the people with minimal silvicultural techniques and management so that the results and
71 sustainability were not optimal.

72 Community forests developed by the government on community-owned land as a
73 demonstration plot for rehabilitation and increased productivity of the land. This
74 community forest development utilizes the government budget through the stages of land
75 preparation, planting and maintenance activities. In addition to building land physically,
76 there is also preparation of socialization for beneficiary farmer groups in the form of
77 management and technical training as well as mentoring by extension workers. BKP5K-
78 Kab.Bogor (2014) stated that farmer groups in the community forest area of Bogor were
79 classified into four groups, namely beginner, intermediate, advanced, and primary groups.

Commented [A10]: confusing definition with behavior

80 Community forests developed by the private sector are very rare in Bogor. The objectives
81 of this study were: (1) to analyze the performance of the attributes of the local community
82 towards community welfare; and (2) reviewing the stratification of community land
83 ownership in community forest areas.

84

85 **Methods**

86 **Research location and data collection** This research was carried out in the Bogor
87 community forest area. The selection of research locations and respondents was done by
88 purposive sampling with the consideration that the location had community forest areas,
89 and respondents had been declared capable of managing their forests in groups. The
90 research method was a survey using a questionnaire. Data collection techniques included
91 observation, interviews, and documentation. The analysis was carried out in a qualitative
92 descriptive manner.

93 Data used to carry out analysis of local institutions include (1) Secondary data,
94 including biophysical/material conditions, community attributes and types of land
95 ownership and utilization. These biophysical data on community forests were collected
96 from BPS (central bureau of statistics) in Bogor, village offices and district offices,
97 research results, and other publication materials. (2) Primary data is obtained from farmers,
98 community leaders, local government agencies, government officials in agricultural and
99 forestry extension services, agroforestry managers and the results of field triangulation in
100 community forests. Attributes include socio-economic data including demographics and
101 monographs, farmer groups, land ownership and control, actors interacting in the field,
102 forest management rules, local community norms/rules, and coordination.

103 The framework elaborated below builds on the institutional analysis and development
104 (IAD) model (Oakerson, 1992; Ostrom, 2005; Poteete et al., 2010). Ratner et al. (2013)
105 selected the IAD model as the foundation because it is highly adaptable, having been
106 applied to a wide range of institutional analyses across different resource systems, and
107 because it also enables an analysis of divergent outcomes, even if historically it has
108 primarily been applied to understand the sources of cooperation. The context incorporates
109 three broad sets of factors (Ostrom, 2005; Ostrom et al., 1994): 1) attributes of the
110 resources, which describe biophysical conditions and trends; 2) attributes of the resource
111 users, which encompasses both local communities and extra-local users; and 3) “rules”,
112 which covers broad governance arrangements down to specific rules regulating use of a
113 given fishery, forest, or pastureland. Each of these factors of context can be broken down

Commented [A11]: Based on the framework described in the method and discussion presented in the Results and Discussion chapter, it seems that the objective of this study is to find out the performance of community forests using an institutional approach and IAD as its framework. If so, then the objective and title of this research need to be adjusted, as well as the background.

Other alternatives:

The purpose of this study is limited only to explain the community attributes (in accordance with the title of this paper). For this reason, it will only discuss the characteristics of community as a fact finding. Consequently a lot of data / information that has been collected is not fully utilized.

Commented [A12]: It seems that this research focuses on one aspect of IAD i.e. community attributes. To be able to explain performance seems to need other aspects that must be examined such as the characteristics of resources and rules in use which together with community attributes will affect action arena and produce performance. The question is how can community attributes directly determine performance?

114 into much more detailed elements depending on the particular situation examined (Poteete
115 et al., 2010).

116 Figure 1 explains the patterns of interaction between actors with dimensions of
117 regulation and control, therefore the function and benefits of forests as community forest
118 areas can be preserved and the improvement of community welfare can be achieved. The
119 criteria used to assess the results were the low of land-use conversion, extensive forest
120 cover (agroforestry), and productive activities carried out by communities in the area
121 surrounding community forests.

122

123 **Results and Discussion**

124 **Biophysical conditions**

125 **Land cover** In 2012, the condition of land cover in Bogor forest consists of production
126 forests covering an area about 16,945.40 ha, rice fields 6,260.46 ha, grazing fields 980.44
127 ha, and fields/moorings covering an area about 4,833.51 ha. In 2015 there has been a
128 change in land cover in the form of production forests which decreased by 0.31% to
129 16,848.60 ha and rice fields which also decreased by 2.06% to 5,617.24 ha. In the same
130 year, there was an increase in settlement to 2,638.45 ha and fields/moorlands increased to
131 5,058.33 ha (Sukwika et al., 2016; Sukwika et al., 2018). In the period of 2012 to 2015,
132 there had been a reduction in community forest cover with an average annual rate of 0.19%
133 and rice fields of 3.42%; while the rate of increase in settlements was 6.56% (Sukwika,
134 2018a).

135 Throughout 2010, part of the state forest area in National Park of Mountain Gede-
136 Pangrango in Bogor has been rehabilitated by the forest, and since the issuance of
137 Presidential Regulation No. 54 of 2008, the Perhutani (state-owned enterprises) has banned
138 logging activities on pine forests (*pine mercusii*), but only carried out activities to protect,
139 rehabilitate and extract forest products in the form of pine sap. Whereas in community
140 forests, land cover conditions outside the forest area have increased. Even though land
141 ownership and transfer of arable land occur to the community outside Bogor, especially
142 from DKI-Jakarta, there is very little land converted to non-forestry. Cultivating farmers
143 who are employed generally are previous landowners or residents who live around
144 community forest areas, making it easier to rehabilitate land vegetatively by planting new
145 trees or technically by making infiltration wells. This mutualism relationship occurs
146 because local people need land that can be processed to increase their income, while
147 landowners outside the community forest area need security over their land rights.

Commented [A13]: Much more better if detail theory of IAD explain in the introduction.

Commented [A14]: In accordance with the previous comments, this chapter needs to add synthesis to explain the relationship between all aspects of IAD so that it can be concluded that the performance of community forests is low.

Commented [A15]: According to Ostrom (2005) an important aspect that must be explained in "biophysical conditions" is the characteristics of provision and consumption of the resources where private property differs from state or communal property, and so on. Therefore it needs to be discussed. Maybe it can be discussed in the land use sub-chapter (or better land ownership or property rights).

148

149 **Land-use** Community forest in Bogor has an area of 16,945.40 ha, around 13,314.02 ha of
150 land-use in the form of plantations forest, rice fields, plantations and agroforestry, seasonal
151 crops, fisheries, livestock, and settlements. Bogor has 40 sub-districts, around 85% of
152 districts have community forest areas. Subdistricts that have more than 100 ha of
153 community forest area include Babakanmadang District (160 ha), Cibungbulang (114 ha),
154 Cisarua (220 ha), Jasinga (5,969 ha), Jonggol (403 ha), Leuwiliang (1,068 ha), and
155 Pamijahan (388.4 ha).

156

157 **Attributes of local communities in community forests** The population of forest village
158 communities in Bogor in 2011 was 88,109 people and in 2015 there were 108,084 people
159 with a density of 6.42 people/ha, meaning that everyone inhabitant occupies every 0.17 ha
160 in the community forest area in Bogor. The rate of population increase between 2011 and
161 2015 was 3.27% per year. The average number of family members is 4 people per family
162 head. This population growth rate includes very high and exceeds the national population
163 growth rate of 1.49%. The high rate of population growth has resulted in higher land needs
164 for settlements and land for businesses, on the other hand, the availability of land is
165 increasingly limited. This condition encourages high changes in the function of
166 yard/business land for settlements. According to (Sukwika, 2018b), the change of
167 vegetated land into built-up land continues in Bogor, this is in line with the increase in the
168 number of local residents and the demand for urban land (Siregar & Sukwika, 2007),
169 therefore, the function of land as community forests is increasingly disrupted.

170 The education level of the forest community in Bogor is classified as low, amounting to
171 76.67% of the people who only have elementary and junior high school education. The
172 population with elementary education is 40,519 (46.86%), junior high school 25,776
173 people (29.81%), high school education 11,638 people (4%), and the level of the academy
174 and tertiary education are 303 people (0.35%). (Pramono, 2009) reported that 85.3% of the
175 respondents in Cisarua Subdistrict had a low level of education (had attended elementary
176 school) and 8.8% had attended school. This social situation fosters a poor perception of
177 efforts to conserve the environment and empower local communities. The results of the
178 study by Pramono & Aminah (2010) state that the livelihoods of community forests in
179 Bogor were still dominated by dryland agriculture, fisheries, and agricultural labour
180 activities by 39.36%, private sector 28.62%, service sector 21.62%, trade sector 9.41% and
181 state civil apparatus 0.9%.

182 The role of the young productive workforce working in the community forestry sector
183 in Bogor is very low at only 25.71%, this sector is still dominated by a fairly old age
184 workforce of 57.14%. The level of formal education of small-holding forest farmers which
185 is in the low category is 54.29% and the level of informal education which is in the low
186 category is 92.86%. The area of land owned/controlled by community forest farmers with a
187 narrow category (less than 0.5 ha) of 70%. The average farmer income is about USD187.5
188 per month with the average family burden of 4 family members per family head. The
189 average community forest farmer in Bogor has quite high farming experience, which is
190 above 10 years (See Table 1). The observation of Ofoegbu et al. (2017) shows that
191 socioeconomic characteristics of households such as farm husbandry skills, years of
192 residence in the community and age influenced use of the forest resources.

193

194 **Land of business** In 2015, land managed by community forest farmers covering an area of
195 30,162.62 ha, including land belonging to local communities and land owned by
196 communities outside of community forests. Of the land area, 27,524.18 ha (91.25%) is
197 land that can be cultivated by the community in the form of production forest land, dry rice
198 fields and the remaining 2,638 ha (8.75%) are land for grazing, ponds, and settlements.
199 The number of people working in the community around the community forest is 26,030
200 households, therefore the average area cultivated by the community is 0.28 ha per
201 household (BKP5K-Kab.Bogor, 2014).

202 Community forest farmers who manage agricultural land can be classified into five
203 groups, namely: (1) farmer-owners as well as cultivators of land, (2) farmer-owners whose
204 land is cultivated by others, (3) farmers cultivating land belonging to others, (4) farmers as
205 proficient who guard other people's land, and (5) farm laborers who work for other
206 farmers. Based on land ownership status, the number of farmers who own and cultivate
207 land is 40.94%, farm labourers account for 49.81%, and the number of farmers working on
208 land belonging to other people and farmers (cultivator and farm workers) is 9.25%
209 (BKP5K-Kab.Bogor, 2014).

210 Based on the results of sampling of 70 community households of community forest
211 farmer groups (KTHR), information was obtained that land ownership of farmer
212 communities per household consisted of 0.17 ha of land owned, 0.47 ha of leased land,
213 0.45 ha of arable land, and 0.12 ha of borrowed land. The average land ownership and/or
214 tenure is 0.36 ha. Based on stratification, the area of land managed by community forest

215 farmers in Bogor is divided into 3 (three) strata groups, namely (1) stratum I: the area of
216 community forest land is more than 1 ha; (2) stratum II: community forest land area 0.5 to
217 1 ha; and (3) strata III: community forest land area is less than 0.5 ha. As much as 70% of
218 community forest farmers manage community forest land less than 0.5 ha (Figure 2).

219 From the results of field identification through a questionnaire survey, land ownership
220 in Bogor's community forests was divided into four classifications (Schlager & Ostrom,
221 1992), namely:

- 222 (1) The group of landowners (owner) is 41.56%, consisting of landowners but not
223 cultivating as much as 0.67% and the group of owners and cultivators of the land as
224 much as 40.89%. The landowner (owner) has the right to enter and utilize land
225 resources (access and withdrawal), determine the form of management (management),
226 determine participation/issue other parties (exclusion) and the right to trade land
227 (alienation).
- 228 (2) The bounded owner group (proprietor) has no land ownership of 0%.
- 229 (3) Claimants are 1.39% of farmers who work on land using a profit-sharing system.
- 230 (4) The authorized user group is 7.03%. The smallholder groups have the right to enter
231 and use land (access and withdrawal).

232 Outside the four groups are farm labourers (50.02%) from community forest farmers,
233 who do not have land ownership rights. The farmer group can only work and get wages
234 from the owner, claimant, or authorized user. The strata of community forest land
235 ownership rights in Bogor are presented in Table 2.

236 The low level of community land tenure and the small income opportunities outside the
237 forestry and agricultural sectors have resulted in the exploitation of land controlled through
238 agricultural cultivation to meet their physical needs, without regard to soil and water
239 conservation efforts. Food crop cultivation is done in monoculture. Planting a mixture of
240 woody plants with food crops can reduce the productivity of food crops because they
241 compete with each other in the site and lighting. With a narrow level of land ownership,
242 there is no opportunity for the community to conserve land so that it has a negative impact
243 on the management of community forest sustainability. The low level of control of land
244 owned and cultivated land by local communities has resulted in a high economic
245 dependence on the families of tenants/farm labourers to the landowners who live in and
246 outside the community forest. Farm labourers, which account for 50.02% of the total
247 number of farmers, do not have land assets to support their family's physical needs so they

248 try to work in landowners (owner), claimants, and authorized land or work in the sector
249 other or out of the territory.

250 The community conducts forestry activities (in the form of *segon*, *jabon*, and *africa*
251 plants), agroforestry and agriculture (in the form of food crops, ornamental flowers,
252 vegetables, fruits, and other perennials), fisheries (in the form of fish ponds), livestock (in
253 the form of chickens and goats), and other productive cultivation activities. Among the
254 cultivated forest plants, there are intercropping plants including corn, sweet potatoes,
255 cassava, and other food crops. Crop productivity per season for rice reaches 6.3 tons/ha,
256 sweet potatoes 12 tons/ha, cassava 17 tons/ha, corn 4 tons/ha, and peanuts 1.25 tons/ha.
257 Food crops, vegetables, and fruits that are cultivated by the community are not carried out
258 intensively. The production of non-timber farmers is mostly for daily needs. While timber
259 farmers' production, tends to be difficult to compete. According to Racevskis & Lupi
260 (2006), competitively in business, rural, timber-dependent community members are very
261 concerned about the continued provision of both market and nonmarket forest outputs.

262

263 **Farmer's family income** The source of farmers' income, if viewed by stratification of land
264 area, shows that the more land cultivated, the more land-use for various types of plants
265 (Figure 3). According to (Saihani, 2011), the area of land that is managed has an effect on
266 the amount of income received by community forest owners, the more land area the greater
267 the income received so as to be able to meet the needs of their families. Fikir et al. (2016)
268 stated that significant variation was also found among income groups: households with
269 higher total annual income obtain more forest income than those with lower income, but
270 they are relatively less dependent on forest products. Besides, various socioeconomic
271 factors were found to influence forest and land income and dependency.

272 In the forest farmer households that process land in the strata III group, they tend to use
273 their land for agroforestry activities. Conversely, farmers in the strata I group are more
274 balanced between land-use for timber and agroforestry. In the three strata groups, there
275 was almost a common tendency, where farmers provided land-use allocation for
276 agroforestry activities. In general, the contributions obtained from the results of
277 agroforestry are very helpful in fulfilling daily needs. Dev et al. (2003) also emphasize on
278 the access of poorer households to essential forest products for their subsistence. In fact, in
279 most developing countries, desires on community forestry are markedly linked to meeting
280 basic needs and serving subsistence purposes, and therefore the benefits to the community
281 is achieved by extracting them directly from the forest (Glasmeyer & Farrigan, 2005).

Commented [A16]: It is better to be part of the Biophysical conditions section.

282 According to Suharjito et al. (2003), if the amount of contribution provided by agroforestry
283 is 10 per cent of the total income of agroforestry activities then it is considered very
284 helpful in meeting needs.

285 Based on the results of a questionnaire survey of 70 respondents, data was obtained that
286 the income of community forest farmers came from the main activities of farming with an
287 average tenure of 0.17 ha and 0.45 ha of arable land and additional income from buying
288 and selling (*warung*), farm labourers, and other additional income. The income of the
289 farmer's family (with the number of members of 4 people) is an average of
290 USD192.5/month. The lowest income is USD7.50/month and a maximum of
291 USD236/month. This average income is still below the 2018 Bogor UMR (regional
292 minimum wages) value of USD376.34/month. This is caused by the limited land owned
293 and cultivated land only covering an area of 0.31 ha (<0.5 ha).

294
295 Farmers' income with land ownership of 1.0 ha from sengon (*Paraserianthes falcataria*)
296 wood averaged USD45.2/month, mahogany (*Swietenia mahagoni*) USD15.3/month, and
297 africa (*Maesopsis eminii*) USD6.7/month. Farmers' income from cultivating food crops
298 (rice, sweet potatoes, cassava) averaged USD48.55/month. The income from vegetable
299 farming and fruit is an average of USD56.5. The income of farmer families who conduct a
300 business shop with a size of 2x3 m² at USD41/month, and become farm labourers of
301 USD45/month. Another productive activity is to do 5-10 goat breeding activities and 5x10
302 m² size ponds, each earning an average of USD66/month and USD53.5/month. The
303 sources of farmers' income are presented in Table 3.

304 The income of these farmer households is still below the minimum physical
305 requirement (KFM) to meet basic consumption needs of USD1088/year or
306 USD90.7/month. This income is also below the regional minimum wage (UMR) of Bogor
307 in 2018, which is USD376.34/month. Decent living needs (KHL) for families with 4 (four)
308 members amounting to USD272/year or USD226.7/month. The calculated value of KHL
309 per capita is calculated based on the expenditure of community households equal to the
310 value of 800 kg of rice per person per year based on the average benchmark price for
311 minimum physical needs (KFM) of 320 kg, education, health, and social respectively
312 161.31 kg (Sinukaban, 2007). The level of income when compared with the values of KFM
313 and KHL, the community forest farmers community in Bogor can be classified as a

Commented [A17]: Derived what kinds and price the yields of farmers cultivation!

314 condition that is less prosperous. The KHL analysis of Bogor farmers is presented in Table
315 4.

316 Farmers' income is spent on eight main needs, namely purchasing food staples 58.05%,
317 operational costs for school children 20.13%, PLN electricity 8.01%, procurement of
318 clothing 2.07%, health maintenance 6.43%, social activities 3.07%, home improvement
319 1.22%, and purchase of hoe farming equipment and other 1.02%. Most of the income of
320 farmer households is spent on meeting basic food needs and operational costs of school
321 children.

322

323 **Community forest farmer group** Based on data from the fisheries and forestry agricultural
324 extension centre (BP3K) community forest farmer groups (KTHR) in Bogor there were
325 312 farmer groups and spread in 12 sub-districts. BP3K is an extension institution at the
326 sub-district level formed by the government as a centre of excellence for farmers by
327 extension workers in the field. Farmer groups are engaged in agriculture and forestry. In
328 Bogor, forestry activities include ~~wood timber~~ products such as *segon* (*Paraserianthes*
329 *falcataria*), ~~mahoni~~ ~~—mahogany~~ (*Swietenia mahagoni*), ~~kayu afrika~~ ~~afriica~~ (*Maesopsis*
330 *emini*), etc., and non-wood such as nutmeg, coffee, cloves, and others. Activities in the
331 forestry sector ~~were~~ also include fertilizer-making activities for ~~—making forest~~ nurseries,
332 ~~making~~ terraces, agroforestry and conserving other lands and water. Based on the type of
333 business, soil conservation activities include vegetative activities and civil engineering.

334 Agricultural activities ~~were are~~ cultivated in the form of food crops such as crops, rice,
335 cassava, sweet potatoes, and others. Livestock activities and inland fisheries in the form of
336 raising goats and carp, and cultivating mushrooms, organic grass, elephant grass, and
337 others. The findings of this study echo those of Gill et al. (2010) and Abrams & Bliss
338 (2013), state that amenity landowners continued, broadly, to institute land-use
339 characteristic of traditional productivist practices: farming, livestock grazing, and timber
340 harvesting.

341 The number of farmer groups who are interested in vegetative activities is as many as
342 312 farmer groups, while the number of farmer groups is interested in civil engineering
343 activities as much as 1 farmer group. Farmers who join forest farmer groups are grouped
344 by level of ability, namely the beginner, intermediate, middle and main groups (Table 5).
345 The results of field observations indicate that there are several farmer groups that are
346 active and independent in their activities, some farmer groups that show a less active

347 attitude, and there are also several other farmer groups just waiting and becoming a place
348 to accommodate government programs. According to Means et al. (2002), decision-making
349 is often based on collaboration, with a consensus emerging from wide-ranging discussions,
350 often fostering local reconciliation.

351

352 **Landowners from outside the village** The community groups that own land domiciled
353 outside the forest area dominate land ownership of almost 70-80% with an average area of
354 0.5-2 ha. Most of these community groups come from Jakarta. The land owned by this
355 group is spread in several districts, such as in Babakanmadang, Sukaraja, Leuwiliang,
356 Dramaga, Ciawi, and Cisarua sub-districts. With the high access to transportation, the area
357 in these sub-districts forms a series of settlements or housing and has connected
358 settlement/public housing activities along the Bogor-Jakarta route. Sukwika (2018a) stated
359 that lands belonging to people outside the community forest area are generally used for
360 settlement construction, vegetable cultivation, fruits, medicinal and ornamental plants, and
361 economic value activities. Before the land is used by the owner for residential buildings,
362 generally the land is not cultivated and neglected (idle land) so that it becomes empty land
363 or becomes shrubs and reeds. Land controlled by people outside the forest area in the form
364 of land owned. Some of the lands are entrusted to guards or cultivators, and some are
365 directly controlled by the owner. Peluso (1992) reminded that secure property rights are
366 often a crucial element in creating clear expectations and thereby reducing conflict. But the
367 distribution of property rights also matters. Highly unequal property rights that deprive
368 many people of even the basic means of subsistence can also lead to conflict. This
369 condition is a challenge for policymakers to formulate development models in the natural
370 resource sectors can link with complementary efforts to strengthen the underlying role of
371 equitable governance and secure rights as a foundation for resilient livelihoods (Ratner,
372 2013). Bohle & Fünfgeld (2007) and Cronkleton et al. (2008) emphasize the concept of a
373 political ecology approach, which emphasizes the positive potential of conflict to spawn
374 social movements or institutional changes that lead to more socially equitable forms of
375 resource use.

376

377 **Local action arena** In 2012, around 20,000 ha of forest land in Bogor were severely
378 damaged, including community forests. Community forest land in Bogor is spread in 40
379 sub-districts, 18 sub-districts are in a severe category and the worst damage occurs in the
380 western region, precisely in the Cisarua District upland area. Damage generally occurs as a

Commented [A18]: Why is it happened?

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381 result of land-use change and the increase in villa buildings or hotels that convert forest
382 land into residential land, in addition to the many illegal buildings that are the main cause
383 of forest destruction. The natural beauty and coolness of the area is a special attraction, so
384 many build buildings for resting or other commercial buildings. The proximity and ease of
385 accessibility from and to Jakarta, such as Babakanmadang, Bojonggede, Ciawi, Cileungsi,
386 Dramaga, Jonggol and Parung sub-districts, were the reasons for the conversion of
387 community forest land in the region. According to Verbist et al. (2004) the drivers of land-
388 use change are distinguished by external and internal factors, population growth as external
389 variables and road and infrastructure development (Siregar & Sukwika, 2007), collection
390 of levies or taxes, and land tenure arrangements as internal variables.

391 Environmental damage is a major cause of increased natural disasters such as floods and
392 landslides in a number of areas. Ironically, the ecological destruction caused by forests and
393 watersheds is exploited without control (Hidayat, 2008; Kahn, 2005). The shift in the
394 function of community forests also makes the surrounding area prone to landslides,
395 although there are indeed community forest areas in several sub-districts of Bogor that
396 have been categorized as landslides. The results of the Herawati (2010) study based on the
397 class of TBE (erosion hazard level) 5 showed that there were 10 sub-districts identified as
398 having land areas with very heavy erosion hazard levels, four of which were Pamijahan (80
399 ha), Ciawi (8 ha), respectively. Cigombong (7 ha), Dramaga (4 ha), Leuwiliang (3 ha). As
400 for the land with the TBE 4 category, 3 of the 16 sub-districts identified as having a land
401 area with severe erosion are Caringin (200 ha), Dramaga (10 ha), Ciomas (5 ha). In these
402 sub-districts so that heavy erosion potential can be reduced, it is necessary to take soil
403 conservation measures and improve soil management, not the other way around, land
404 conversion on the basis of economic value. Change or conversion of forest areas into other
405 forms of use (deforestation) that have high economic values such as agriculture (Ewers,
406 2006) and residential area development (Jorgenson & Burns, 2007; Nasendi, 2000).
407 Verbist et al. (2004) and Yusuf (2004) indicate that damage to forest areas is caused by
408 several factors, one of which is the problem of changing (transferring) forest areas into
409 other areas. Changes in forest areas can be in the form of changes in designation, namely
410 in the form of exchanging forest areas and releasing forest areas, for the benefit of
411 plantations, transmigration settlements, industries, housing, offices and so on. The change
412 in the function of the forest area is to change the function of the forest area for interests
413 outside the forestry sector (Maladi, 2013). In addition, there is another form, namely the
414 use of forest areas known as forest use loan permits (Siombo, 2014).

415

416 **Transfer of community forest land ownership** The transfer of land ownership in
417 community forests involves the role of a land broker or a local term called "*biyong*".
418 "*Biyong*" generally comes from the local village community, although there are also those
419 from outside the village but still within the community forest area. *Biyong* has an active
420 role in finding information on land that will be sold by local people and seeking
421 information on potential buyers from outside the community forest. In its development, in
422 the 2000s, the share of sales commissions (fees) for "*biyong*" averaged 2.5% of buyers and
423 also requested a number of voluntary commissions from the buyers. According to Sukwika
424 (2018a), there are some "*biyong*" who use the scheme, if there is a seller offering a certain
425 price, for example, USD10 per m², then offered to the buyer with a selling price of USD20
426 or greater than the original price. With the increase in the price offered by "*biyong*",
427 "*biyong*" asks for a portion of the voluntary sales commission of 0-2.5% from the seller.
428 Administrative arrangements to complete the sale and purchase agreement starting from
429 RT/RW to sub-districts reached 2.5-5% of the sales value of the land. The role of RT/RW,
430 village to sub-district is to make a statement that the land being traded is not in dispute
431 with other parties. This certificate is generally a guarantee to the buyer that the land to be
432 traded is safe to buy. The role of *biyong* is very important in land ownership, which is to
433 help find buyers for the local community, find land to be bought by the buyer, and provide
434 security guarantees for the land that is traded to the buyer. While Fisher et al. (2018)
435 suspected that land conversion was easy because of flawed land administration processes,
436 entrenched political-economic interests among local actors, and lack of institutional
437 engagement beyond the permitting process. Mendham & Curtis (2010) examine the
438 phenomenon of turnover in rural property ownership by certain actors. Its findings in the
439 form of sales records and spatially referenced rural landholder survey data. Mendham &
440 Curtis (2010) stated that new property owners are significantly different from longer-term
441 landholders in that they own smaller properties; are less likely to be farmers by occupation;
442 are more likely to value conservation over agricultural production, and are less likely to
443 adopt recommended sustainability practices.

444 The level of ownership of land owned and cultivated land by the outside community is
445 wider (70-80%) than the ownership of local communities (20-30%). Communities outside
446 make decisions in managing land owned in community forests. The outside community is
447 more powerful in controlling the behaviour of local farmers who work on their land or they
448 allow their land to become idle land. Gill et al. (2010) state that amenity ownership of rural

Commented [A20]: First, describe the statue of the forest land. Is it the state forest or Private forest? Make it clear!

Commented [A21]: In state forest it was forbidden to transfer or to trade?

Commented [A22]: Discuss this theme with the ilegal transaction in forest state? Describe the background this phenomenon wheter it influenced by economic factor? Whatkind thet economic factor?

Commented [A23]: Is it state that economic factor more stronger of land power occupation than the community in and outside? Is it the merely case on Perhutani Forest?

449 lands by outside community often implies a blurring of production, consumption, and
450 protection practices rather than a wholesale eclipse of production. Research by Chomba et
451 al. (2015) in community forests found that national forest policies and actors transferred
452 minimal powers that enabled local communities to execute forest protection and
453 conservation roles while maintaining legislative powers and control of economic benefits
454 centrally. Responding to the conditions above, L'Roe & Rissman (2017) considers the
455 need for a partnership strategy in the form of joint forest management (Rangan & Lane,
456 2001) with local communities. Investor partnership strategies and conservation programs
457 can be shaped by the provision of forest benefits during ownership transitions.

458 Local rules with existing wisdom and land-use rules from the government are no longer
459 able to direct the behaviour of farmers properly. Demand for agricultural commodities and
460 demand for land for villa settlements or tourism businesses has reduced farmland capital
461 and changed the behaviour of farmers to be not conservative. Such conditions cause land
462 resources and water sources to decline. According to Putzel et al. (2015) that development
463 policy, formalization frequently based on current social and environmental norms.
464 However, its adoption is often unsuccessful and entails risks including leakage, barriers to
465 small or poor actors, and negative effects on marginalized groups.

466 Poor environmental quality due to the neglect of problems and environmental impacts
467 in forest development is a major factor in environmental disasters that affect the
468 unsustainable social and economic quality (Kusmana & Sukwika, 2018; Rahman et al.,
469 2017). This places the level of vulnerability of the region to environmental disasters even
470 greater. A study conducted by Skulska et al. (2019) stated that community-based forestry is
471 faced with environmental challenges such as degradation, wildfires and loss of
472 biodiversity. Resolution of these challenges is urgently needed at the legal, administrative
473 and local levels. While Rangan & Lane (2001) highlighted that forest access and
474 ownership made by indigenous communities that have been historically disadvantaged and
475 marginalized from the benefits of mainstream social and economic development. The
476 problem can be approached with joint forest management (JFM). There are three concepts
477 JFM approach scheme are access, control, and substantive democracy to assess the relative
478 strengths and weaknesses of institutional processes that aim to engage in the sustainable
479 management of forest resources.

480

481 ***Farm owner and farm labourers*** Farmers owning land in community forests in Bogor
482 plant areas with wood species such as *sengon* (*Paraserianthes falcataria*), *jabon*

Commented [A24]: State the some reason You choose this system? Is it suitable for Indonesia? (focus on the forest characteristics, actors, government role, and silviculture system)
This is very weak reason!

483 (*Anthocephalus cadamba*), ~~mahoni~~ ~~mahogany~~ (*Swietenia mahagoni*), ~~kayu afrika~~ ~~afrika~~
484 (*Maesopsis eminii*), teak (*Tectona grandis*), and mixtures. The community is interested in
485 the ownership rights of forest areas, especially for planting *sengon* plantation. It was
486 plants because of the benefits of economic value that can be obtained in it and others.
487 *Sengon* wood species are chosen by farmers because their cultivation has been mastered
488 for generations, has a relatively short life cycle (5-8 years) and has a clear market. Farmers
489 usually sell *sengon* in the form of stands and several types of annual crops such as durian,
490 mangosteen, rubber, coconut, petai, clove and others, besides that there are also rice and
491 secondary crops.

492 Communities that have community forest land played an important role in making
493 decisions about the land they have. Then, if farmers owning community forests have
494 been incorporated into community forest farmer groups, then in relation to decisions in the
495 exploitation of community forests, the farmer's family is the most decisive party. In
496 community forestry, direct forest users were are expected play an important role in the
497 common decision making procedures and implementation of forestry activities (Boon,
498 2000; Charnley & Poe, 2007; Maryudi et al., 2012; Pramono & Aminah, 2010; Sukwika,
499 2018a). Families also had have a dominant role in deciding whether their land will still be
500 maintained as community forests or will be used for other uses. For example, the land
501 originally designated as community forest was diverted to building houses, building
502 infrastructure and other public facilities. Community forests are considered to have high
503 economic, ecological and social values, therefore it is necessary to consider the existence
504 of an institutional model that can play an effective role in preserving community forests,
505 for example, the village government regulates the management of logging permits and the
506 Bogor government controls development in its territory. Further according to Charnley &
507 Poe (2007) that community forestry refers to forest management that has ecological
508 sustainability and local community benefits as central goals, with some degree of
509 responsibility and authority for forest management formally vested in the community.

510 Land ownership in community forest areas is not only owned by local communities, but
511 also from people who live outside community forest areas, even 60% of land ownership
512 rights are owned by people who live outside the community forest area. This community
513 group plays a role in making decisions about the land owned and the land that it controls.
514 Besides that, he also has an interest in controlling his land so that it is safe from other
515 parties' claims (secure property right). In a community group, Putzel et al. (2015) stressed

Commented [A25]: Why its happened?

516 that they also contend with histories of ownership, access rights, market configurations,
517 and practices attached to resources and the lands in which they are located.

518 The type of work of farm labourers in community forest areas is the highest occupancy
519 after farmers. Farmers in community forests are generally farmers, of which there are also
520 those who own their own land, usually less than 0.10 ha. Types of activities carried out by
521 farmworkers starting from land clearing, planting and harvesting. The existence of these
522 community groups is the driver of the implementation of agroforestry activities in
523 community forest areas. Farm workers are often involved because of shortages of labour
524 from within the family. The labour costs of farm labourers in community forests are in
525 accordance with community recognition of USD2.5-3.5 per day.

526

527 ***The level of welfare of the local community*** On the economic aspect, farmers' land tenure
528 in the form of land owned by 0.17 ha and 0.45 ha of arable land only earn an average
529 income of USD231/year or USD192.5/month. This average income is still below the 2018
530 Bogor regional minimum wage value of USD376.34/month. This is caused by the limited
531 land owned and cultivated land only covering an area of 0.31 ha (<0.5 ha). The standard of
532 decent living needs (KHL) for families with 4 (four) members is USD272/year or
533 USD226.7/month. The value calculated from the KHL per capita is calculated based on the
534 expenditure of the community household equal to the value of 800 kg of rice per person
535 per year based on the average benchmark price for minimum physical needs (KFM) of 320
536 kg, education, health and social respectively 160kg (Sinukaban, 2007). Based on the level
537 of income, when compared with the values of KFM and KHL, the community forest
538 farmers in Bogor can be classified as under-prosperous.

539 For smallholding forest farmers, community forestry businesses generally become the
540 main source of income. Farmers' household income can reflect their household economic
541 condition. The high and low level of household income can be used as one indicator of the
542 level of welfare of a household. The level of income is influenced by the number of types
543 of business carried out by farmers. Tree ownership also creates more permanent rights to
544 farmland and is prestigious in the community. (Khususiyah et al., 2010; Maryudi et al.,
545 2012; Rahman et al., 2017; Sukwika et al., 2016; Sukwika et al., 2018). Farmers' income in
546 the community forest area of Bogor comes from income sources in the form of: timber
547 products averaging USD22.4/month for ownership of an area of 1.0 ha, food crops on
548 average USD48.55/month, vegetables and fruits on average an average of USD6.5/month,
549 a house stall business with a size of 2x3 m² of USD45/month, and being a farm laborer of

550 USD45/month. Other productive activities from raising 5-10 goats and 5x10 m² ponds
551 each earn an average of USD66/month and USD53.5/month.

552 Referring to the income from some of these farming activities, farmers in community
553 forests can be classified as poor or not prosperous. With these poor conditions, the
554 behaviour of farmers is not able to finance their family members to continue their
555 education to a higher level. Current conditions, according to data from 70 respondents, the
556 education level of community forests are classified as low educated with the majority of
557 elementary and junior high school education (84.29%). With narrow land ownership, low
558 education, and relatively small family income, the tendency of community behaviour in
559 farming is more exploitative.

560

561 **Conclusion**

562 The performance of community attributes in community forest areas is classified as
563 weak because it is not effective in regulating community behaviour to achieve the
564 objectives of community forest management including economic, social and ecological
565 goals. This is indicated by the low performance achieved in community welfare and forest
566 land exploitation, namely the ownership of land resources is very low and almost does not
567 even have land, the level of welfare of local communities including the poor, and public
568 education is relatively low. The biggest contribution to the source of income of
569 smallholding forest farmers comes from the agroforestry sector. On the other hand, the
570 challenge of the community forest farmer family is the level of expenditure of the farmer
571 family is still higher than the monthly income, the number of family dependents is
572 relatively high, and does not have savings for the family. Based on the results of the
573 analysis of the strata of land ownership rights by community forest farmers, 70% of
574 farmers are in the third strata, namely land ownership of fewer than 0.5 hectares, and
575 41.56% of the community forest farming community groups are classified as landowners.

576

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581 thank the editorial team for its support.

582

583 **References**

Commented [A26]: Please suitable with the purposes of this research!

Commented [A27]: Based on IAD, community attributes alone cannot affect performance.

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756 Table 1 Attributes of community forest farming communities

Description	Category	Total	
		n	%
Age	Youth (< 41 years)	18	25,71
	Middle Age (41 - 56 years)	40	57,14
	Old Age (> 57 years)	12	17,14
Total		70	
Formal Education	Low (< 9 years)	38	54,29
	Medium (10 - 12 years)	21	30,00
	High (> 12 years)	11	15,71
Total		70	
Non-Formal Education	Low (< 29 hours)	65	92,86
	Medium (30 - 59 hours)	5	7,14
	High (> 60 hours)	0	0,00
Total		70	
Farming Experience	Low (< 5 years)	4	5,71
	Medium (5 - 10 years)	18	25,71
	High (> 10 years)	48	68,57
Total		70	
Land Area	Narrow (< 0,5 ha)	49	70,00
	Medium (0,5 - 1,0 ha)	15	21,43
	Wide (> 1.0 ha)	6	8,57
Total		70	
Income	Low (< USD 150)	23	32,86
	Medium (USD 150 - 225)	38	54,29
	High (> USD 225)	9	12,86
Total		70	
Number of Family	Small (< 3 people)	11	15,71
	Medium (3 - 5 people)	36	51,43
	Large (> 5 people)	23	32,86
Total		70	

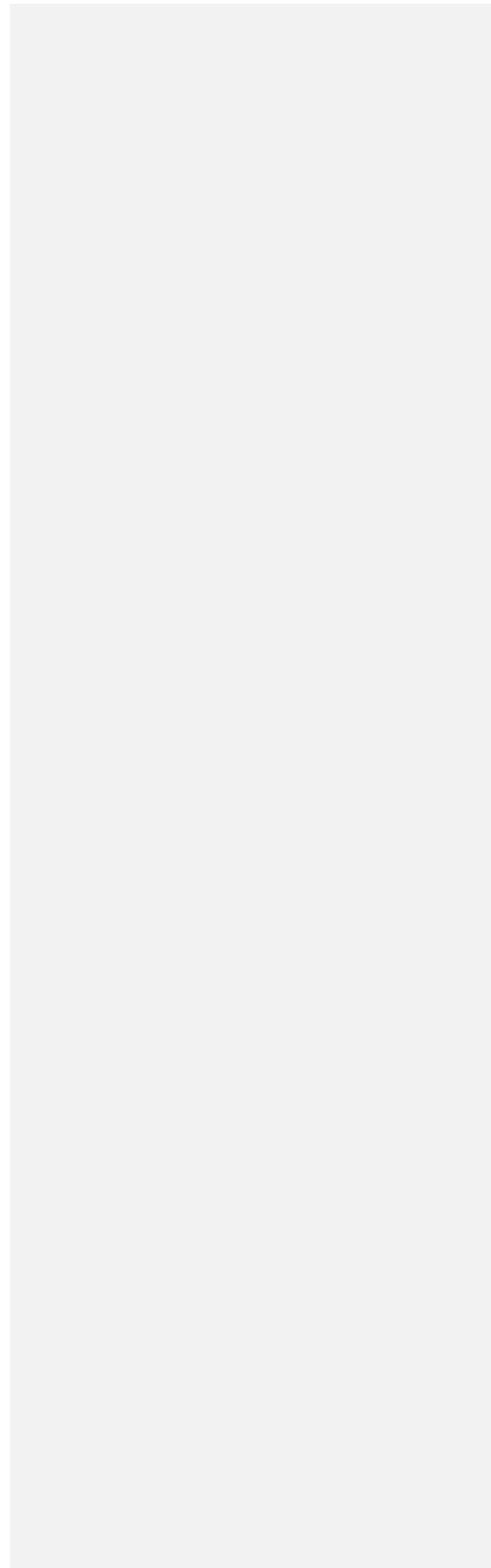
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759 Table 2 Strata of land ownership rights and community forest farming community groups

<i>Community group</i>	<i>Owner</i>	<i>Propieter</i>	<i>Claimant</i>	<i>Autorized</i>
<i>Rights stratum</i>				
Access and withdraw	√	X	√	7.03%
Determine the form of management	√	X		1.39%
Determining participation/ issuing other parties (exclusion)	√	X		
Can trade rights (alienation)				41.56%
Description: √ = exists, X = none.				
Note: Farmworkers (50.02%) do not have land ownership rights, therefore, they work in landowner groups, claimants, and users (authorized)				

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762



763 Table 3 Source of income of the respondent farmer's family from agricultural activities
764 and additional activities in community forests

No	Source of income	Income	
		Monthly income (USD/month)	Annual income (USD/year)
1	Sengon, mahoganv, afrika Community Forest	67.20	806.40
			18.47%
2	Farming vegetables and fruit	48.55	582.60
3	Farm vegetables and fruit	56.55	678.60
	Agriculture		28.89%
4	Farm laborers	31.00	372.00
5	Household stalls	41.00	492.00
6	Sheep breeding 5-10 tails	66.00	792.00
7	Fish ponds	53.50	642.00
	Etc.		52.64%

765
766 Table 4 The necessities of life are worthy of community forest farmers the necessities
767 of life are worthy of community forest farmers

No	Expenditures Type	%	Rice (Kg)	Price of rice* (USD /Kg)	Expend i-tures (USD /Fam /Year)	Numbe r of family membe rs	Needs (USD /Fam /Yr)	Needs (USD /Fam /Mon)
<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>	<i>i</i>
		% <i>d</i>			<i>d x e</i>		<i>e x f</i>	<i>f/12</i>
1	KFM	10 0	320	0.71	227.2	4	161.3 1	18.9
2	Education	50	160	0.71	113.6	4	80.66	9.5
3	Health	50	160	0.71	113.6	4	80.66	9.5
4	Social, Saving, etc.	50	160	0.71	113.6	4	80.66	9.5
5	KHL	25 0	800	0.71	568.0	4	403.2 8	47.3

768 Note: *) Average price of consumption (medium) rice in Bogor 2018

769
770 Table 5 Data recapitulation of forest farmer groups

No	BP3K / Groups	Level of group ability				Total	number of members
		B	A	I	M		
1	Cariu	18	16	3	0	37	868
2	Jonggol	8	22	14	0	44	1676
3	Gunung Putri	13	1	1	0	15	248
4	Cibinong	14	40	7	1	62	1018
5	Ciawi	8	8	2	0	18	524
6	Caringin	18	7	0	0	25	885
7	Dramaga	10	4	2	0	16	375
8	Cibungbulang	1	21	9	0	31	892

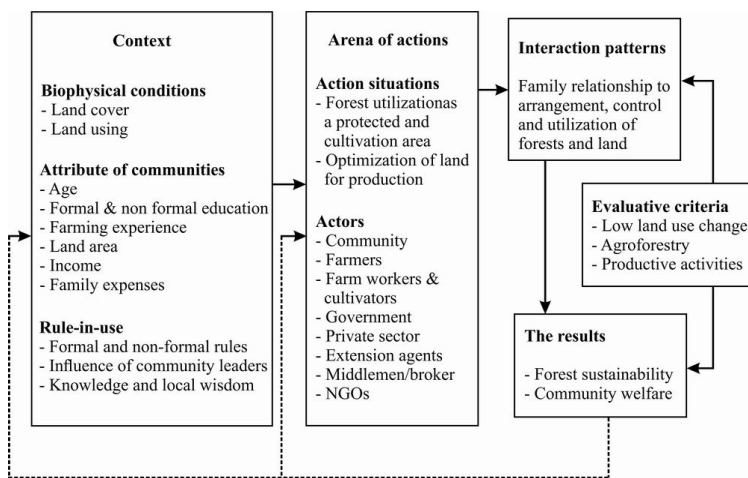
9	Leuwiliang	4	14	2	1	21	1051
10	Cigudeg	4	11	0	0	15	614
11	Parung Panjang	6	10	0	0	16	587
12	Ciseeng	3	6	2	1	12	243
TOTAL		107	160	42	3	312	8981

Note:

B: Beginner Group I: Intermediate Group

A: Advanced Group M: Main Group

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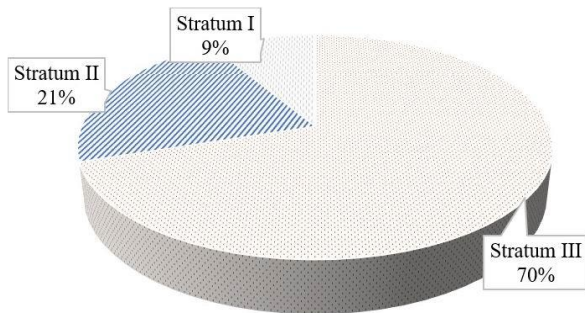
Source : Adopted from Ostrom (2005) and Di Gregorio et al. (2008), with modification

777

Figure 1 Arena of action for community forest management action.

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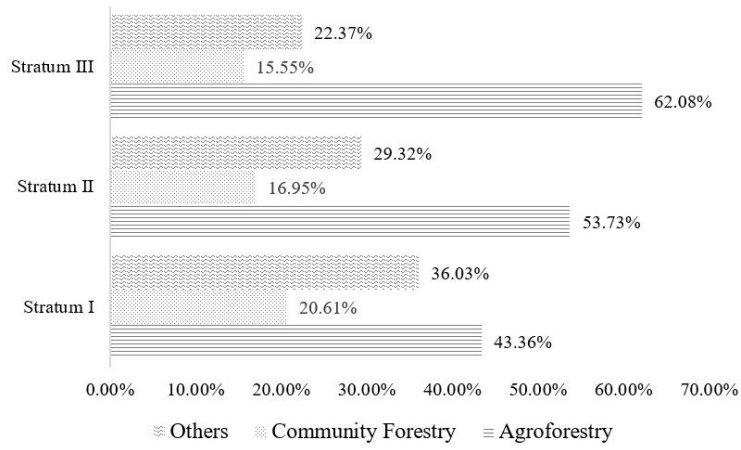
N=70: Average farmer's land area = 0.36 ha

780

Figure 2 Strata of land ownership by community forest farmers.

781

782



783

784 Figure 3 Contribution of the source of income to community forest farmer households.

785

Local Community Attributes and Stratification of Land Ownership in Surrounding Community Forests in Bogor

Abstract

Management of forest resources cannot be separated from the character attributes of the community. In the arena of community forest action, access to forest resources which is a people's livelihood is an important element. The study aimed to analyze the performance of the local community attributes towards community welfare and examine the stratification of community land ownership. This research was carried out in ~~the a~~ qualitative descriptive analysis. The results of the analysis showed that 41.56% of the community forest farming groups classified as land-owners. Based on the strata of land ownership ~~rights~~ showed that 70% in the third strata, which was land-ownership of less than 0.5 ha. This study concluded that the performance of the community attributes in the community forest area was relatively low because not effective in regulating community behaviour. These indicated by the low performance achieved on the welfare of the community, the low ownership of the area of arable land, the level of welfare of the local community falls into the category of poor, and low community education.

Keywords: community attributes, community forests, land stratification, qualitative-descriptive analysis

Introduction

The community forest is one of the resources that provide great benefits for human welfare, both directly and indirectly benefits. Direct benefits such as the provision of wood, supporting the availability of food and beverage ingredients, medicinal ingredients, and animals. Indirect benefits of community forests such as the benefits of protection and regulation of water management, facilities for handling critical land, land conservation, forest protection, and prevention of erosion. The benefits mentioned above can be optimal if aspects of the availability of land around community forests in their management can provide a positive influence on welfare (social and economic) and environment (ecology) in a sustainable manner.

The form of cooperation in managing forest resources cannot be separated from the character attributes of the community itself. In fact, in the arena of community forest action, access to forest resources is considered a source of community livelihood (Sukwika et al., 2018) and is an important element in creating group collaboration (Ratner et al., 2013; Sukwika, 2018a). Ostrom (2005) stated that some communities that influence the arena of action include: (1) behavioural values recognized by the community; (2) the level of homogeneity of people's life preferences; and (3) the size and composition of the community.

Commented [A1]: Community attributes produce performance? Community attributes describe the characteristics of the community like welfare of the community, ownership of the area of arable land, the level of welfare of the local community, and community education, etc?

Commented [A2]: spices?

Commented [A3]: herbal medicine?

Commented [A4]: protecting and regulating water flow?

Commented [A5]: ???

45 The pattern of land tenure in community forests consists of three patterns, namely
46 individual land, family-owned land, and leased land. (1) Individual land is a land that is
47 legally the property of one person, and at the same time, the person concerned manages the
48 land. (2) Family-owned land is land in one stretch, derived from the legacy of deceased
49 parents, but has not been distributed to each of the heirs (children). For the land, they usually
50 manage and use the land together or take turns. If the land wants to be sold, all heirs must
51 approve it. (3) A rental land is a person who uses or rent a plot of land oriented to an
52 economic approach.

53 In community forests, there are various initiatives, forms and management systems.
54 Based on its management initiatives, there were three initiators of community forest
55 development, namely: landowners, the government and the private sector. Community
56 forests built at the initiative of land-owners were found in Bogor. The owner takes the
57 initiative to plant his land with the type of annual plant for the purpose of utilizing the
58 product or as a source of income for his family. In the community forest model such as this
59 aspect of species selection, capital development and technology input depends entirely on
60 the desire, level of knowledge, capital ownership and the environment that influences it.
61 According to Suharti (2001), environmental factors such as the success of others in
62 developing a commodity become the reasons often raised by community forest farmers in
63 choosing the type of plant.

64 The community forest model in Bogor is a traditional community forest, which is
65 developed from generation to generation by several community groups. Its main
66 characteristic is management with agroforestry patterns and minimal technological input.
67 This is in line with the results of a study by Sukwika et al. (2016) and Sukwika (2018a)
68 which stated that community forest management in Bogor was still traditionally carried out
69 by the people with minimal silvicultural techniques and management so that the results and
70 sustainability were not optimal.

71 Community forests developed by the government on community-owned land as a
72 demonstration plot for rehabilitation and increased productivity of the land. This community
73 forest development utilizes the government budget through the stages of land preparation,
74 planting and maintenance activities. In addition to building land physically, there is also
75 preparation of socialization for beneficiary farmer groups in the form of management and
76 technical training as well as mentoring by extension workers. BKP5K-Kab.Bogor (2014)
77 stated that farmer groups in the community forest area of Bogor were classified into four
78 groups, namely beginner, intermediate, advanced, and primary groups. Community forests

Commented [A6]: confusing definition with behavior

79 developed by the private sector are very rare in Bogor. The objectives of this study were: (1)
80 to analyze the performance of the attributes of the local community towards community
81 welfare; and (2) reviewing the stratification of community land ownership in community
82 forest areas.

84 **Methods**

85 **Research location and data collection** This research was carried out in the Bogor
86 community forest area. The selection of research locations and respondents was done by
87 purposive sampling with the consideration that the location had community forest areas, and
88 respondents had been declared capable of managing their forests in groups. The research
89 method was a survey using a questionnaire. Data collection techniques included observation,
90 interviews, and documentation. The analysis was carried out in a qualitative descriptive
91 manner.

92 Data used to carry out analysis of local institutions include (1) Secondary data, including
93 biophysical/material conditions, community attributes and types of land ownership and
94 utilization. These biophysical data on community forests were collected from BPS (central
95 bureau of statistics) in Bogor, village offices and district offices, research results, and other
96 publication materials. (2) Primary data is obtained from farmers, community leaders, local
97 government agencies, government officials in agricultural and forestry extension services,
98 agroforestry managers and the results of field triangulation in community forests. Attributes
99 include socio-economic data including demographics and monographs, farmer groups, land
100 ownership and control, actors interacting in the field, forest management rules, local
101 community norms/rules, and coordination.

102 The framework elaborated below builds on the institutional analysis and development
103 (IAD) model (Oakerson, 1992; Ostrom, 2005; Poteete et al., 2010). Ratner et al. (2013)
104 selected the IAD model as the foundation because it is highly adaptable, having been applied
105 to a wide range of institutional analyses across different resource systems, and because it
106 also enables an analysis of divergent outcomes, even if historically it has primarily been
107 applied to understand the sources of cooperation. The context incorporates three broad sets
108 of factors (Ostrom, 2005; Ostrom et al., 1994): 1) attributes of the resources, which describe
109 biophysical conditions and trends; 2) attributes of the resource users, which encompasses
110 both local communities and extra-local users; and 3) “rules”, which covers broad governance
111 arrangements down to specific rules regulating use of a given fishery, forest, or pastureland.

Commented [A7]: Based on the framework described in the method and discussion presented in the Results and Discussion chapter, it seems that the objective of this study is to find out the performance of community forests using an institutional approach and IAD as its framework. If so, then the objective and title of this research need to be adjusted, as well as the background.

Other alternatives:

The purpose of this study is limited only to explain the community attributes (in accordance with the title of this paper). For this reason, it will only discuss the characteristics of community as a fact finding. Consequently a lot of data / information that has been collected is not fully utilized.

Commented [A8]: It seems that this research focuses on one aspect of IAD i.e. community attributes. To be able to explain performance seems to need other aspects that must be examined such as the characteristics of resources and rules in use which together with community attributes will affect action arena and produce performance. The question is how can community attributes directly determine performance?

112 Each of these factors of context can be broken down into much more detailed elements
113 depending on the particular situation examined (Poteete et al., 2010).

114 Figure 1 explains the patterns of interaction between actors with dimensions of regulation
115 and control, therefore the function and benefits of forests as community forest areas can be
116 preserved and the improvement of community welfare can be achieved. The criteria used to
117 assess the results were the low of land-use conversion, extensive forest cover (agroforestry),
118 and productive activities carried out by communities in the area surrounding community
119 forests.

120

121 **Results and Discussion**

122 **Biophysical conditions**

123 **Land cover** In 2012, the condition of land cover in Bogor forest consists of production
124 forests covering an area about 16,945.40 ha, rice fields 6,260.46 ha, grazing fields 980.44
125 ha, and fields/moorings covering an area about 4,833.51 ha. In 2015 there has been a change
126 in land cover in the form of production forests which decreased by 0.31% to 16,848.60 ha
127 and rice fields which also decreased by 2.06% to 5,617.24 ha. In the same year, there was
128 an increase in settlement to 2,638.45 ha and fields/moorlands increased to 5,058.33 ha
129 (Sukwika et al., 2016; Sukwika et al., 2018). In the period of 2012 to 2015, there had been a
130 reduction in community forest cover with an average annual rate of 0.19% and rice fields of
131 3.42%; while the rate of increase in settlements was 6.56% (Sukwika, 2018a).

132 Throughout 2010, part of the state forest area in National Park of Mountain Gede-
133 Pangrango in Bogor has been rehabilitated by the forest, and since the issuance of
134 Presidential Regulation No. 54 of 2008, the Perhutani (state-owned enterprises) has banned
135 logging activities on pine forests (*pine mercusii*), but only carried out activities to protect,
136 rehabilitate and extract forest products in the form of pine sap. Whereas in community
137 forests, land cover conditions outside the forest area have increased. Even though land
138 ownership and transfer of arable land occur to the community outside Bogor, especially from
139 DKI-Jakarta, there is very little land converted to non-forestry. Cultivating farmers who are
140 employed generally are previous landowners or residents who live around community forest
141 areas, making it easier to rehabilitate land vegetatively by planting new trees or technically
142 by making infiltration wells. This mutualism relationship occurs because local people need
143 land that can be processed to increase their income, while landowners outside the community
144 forest area need security over their land rights.

145

Commented [A9]: Much more better if detail theory of IAD explain in the introduction.

Commented [A10]: In accordance with the previous comments, this chapter needs to add synthesis to explain the relationship between all aspects of IAD so that it can be concluded that the performance of community forests is low.

Commented [A11]: According to Ostrom (2005) an important aspect that must be explained in "biophysical conditions" is the characteristics of provision and consumption of the resources where private property differs from state or communal property, and so on. Therefore it needs to be discussed. Maybe it can be discussed in the land use sub-chapter (or better land ownership or property rights).

146 **Land-use** Community forest in Bogor has an area of 16,945.40 ha, around 13,314.02 ha of
147 land-use in the form of plantations forest, rice fields, plantations and agroforestry, seasonal
148 crops, fisheries, livestock, and settlements. Bogor has 40 sub-districts, around 85% of
149 districts have community forest areas. Subdistricts that have more than 100 ha of community
150 forest area include Babakanmadang District (160 ha), Cibungbulang (114 ha), Cisarua (220
151 ha), Jasinga (5,969 ha), Jonggol (403 ha), Leuwiliang (1,068 ha), and Pamijahan (388.4 ha).

152

153 **Attributes of local communities in community forests** The population of forest village
154 communities in Bogor in 2011 was 88,109 people and in 2015 there were 108,084 people
155 with a density of 6.42 people/ha, meaning that everyone inhabitant occupies every 0.17 ha
156 in the community forest area in Bogor. The rate of population increase between 2011 and
157 2015 was 3.27% per year. The average number of family members is 4 people per family
158 head. This population growth rate includes very high and exceeds the national population
159 growth rate of 1.49%. The high rate of population growth has resulted in higher land needs
160 for settlements and land for businesses, on the other hand, the availability of land is
161 increasingly limited. This condition encourages high changes in the function of
162 yard/business land for settlements. According to (Sukwika, 2018b), the change of vegetated
163 land into built-up land continues in Bogor, this is in line with the increase in the number of
164 local residents and the demand for urban land (Siregar & Sukwika, 2007), therefore, the
165 function of land as community forests is increasingly disrupted.

166 The education level of the forest community in Bogor is classified as low, amounting to
167 76.67% of the people who only have elementary and junior high school education. The
168 population with elementary education is 40,519 (46.86%), junior high school 25,776 people
169 (29.81%), high school education 11,638 people (4%), and the level of the academy and
170 tertiary education are 303 people (0.35%). (Pramono, 2009) reported that 85.3% of the
171 respondents in Cisarua Subdistrict had a low level of education (had attended elementary
172 school) and 8.8% had attended school. This social situation fosters a poor perception of
173 efforts to conserve the environment and empower local communities. The results of the study
174 by Pramono & Aminah (2010) state that the livelihoods of community forests in Bogor were
175 still dominated by dryland agriculture, fisheries, and agricultural labour activities by
176 39.36%, private sector 28.62%, service sector 21.62%, trade sector 9.41% and state civil
177 apparatus 0.9%.

178 The role of the young productive workforce working in the community forestry sector in
179 Bogor is very low at only 25.71%, this sector is still dominated by a fairly old age workforce

180 of 57.14%. The level of formal education of small-holding forest farmers which is in the low
181 category is 54.29% and the level of informal education which is in the low category is
182 92.86%. The area of land owned/controlled by community forest farmers with a narrow
183 category (less than 0.5 ha) of 70%. The average farmer income is about USD187.5 per month
184 with the average family burden of 4 family members per family head. The average
185 community forest farmer in Bogor has quite high farming experience, which is above 10
186 years (See Table 1). The observation of Ofoegbu et al. (2017) shows that socioeconomic
187 characteristics of households such as farm husbandry skills, years of residence in the
188 community and age influenced use of the forest resources.

189

190 **Land of business** In 2015, land managed by community forest farmers covering an area of
191 30,162.62 ha, including land belonging to local communities and land owned by
192 communities outside of community forests. Of the land area, 27,524.18 ha (91.25%) is land
193 that can be cultivated by the community in the form of production forest land, dry rice fields
194 and the remaining 2,638 ha (8.75%) are land for grazing, ponds, and settlements. The number
195 of people working in the community around the community forest is 26,030 households,
196 therefore the average area cultivated by the community is 0.28 ha per household (BKP5K-
197 Kab.Bogor, 2014).

198 Community forest farmers who manage agricultural land can be classified into five
199 groups, namely: (1) farmer-owners as well as cultivators of land, (2) farmer-owners whose
200 land is cultivated by others, (3) farmers cultivating land belonging to others, (4) farmers as
201 proficient who guard other people's land, and (5) farm laborers who work for other farmers.
202 Based on land ownership status, the number of farmers who own and cultivate land is
203 40.94%, farm labourers account for 49.81%, and the number of farmers working on land
204 belonging to other people and farmers (cultivator and farm workers) is 9.25% (BKP5K-
205 Kab.Bogor, 2014).

206 Based on the results of sampling of 70 community households of community forest
207 farmer groups (KTHR), information was obtained that land ownership of farmer
208 communities per household consisted of 0.17 ha of land owned, 0.47 ha of leased land, 0.45
209 ha of arable land, and 0.12 ha of borrowed land. The average land ownership and/or tenure
210 is 0.36 ha. Based on stratification, the area of land managed by community forest farmers in
211 Bogor is divided into 3 (three) strata groups, namely (1) stratum I: the area of community
212 forest land is more than 1 ha; (2) stratum II: community forest land area 0.5 to 1 ha; and (3)

213 strata III: community forest land area is less than 0.5 ha. As much as 70% of community
214 forest farmers manage community forest land less than 0.5 ha (Figure 2).

215 From the results of field identification through a questionnaire survey, land ownership in
216 Bogor's community forests was divided into four classifications (Schlager & Ostrom, 1992),
217 namely:

- 218 (1) The group of landowners (owner) is 41.56%, consisting of landowners but not
219 cultivating as much as 0.67% and the group of owners and cultivators of the land as
220 much as 40.89%. The landowner (owner) has the right to enter and utilize land resources
221 (access and withdrawal), determine the form of management (management), determine
222 participation/issue other parties (exclusion) and the right to trade land (alienation).
- 223 (2) The bounded owner group (proprietor) has no land ownership of 0%.
- 224 (3) Claimants are 1.39% of farmers who work on land using a profit-sharing system.
- 225 (4) The authorized user group is 7.03%. The smallholder groups have the right to enter and
226 use land (access and withdrawal).

227 Outside the four groups are farm labourers (50.02%) from community forest farmers, who
228 do not have land ownership rights. The farmer group can only work and get wages from the
229 owner, claimant, or authorized user. The strata of community forest land ownership rights
230 in Bogor are presented in Table 2.

231 The low level of community land tenure and the small income opportunities outside the
232 forestry and agricultural sectors have resulted in the exploitation of land controlled through
233 agricultural cultivation to meet their physical needs, without regard to soil and water
234 conservation efforts. Food crop cultivation is done in monoculture. Planting a mixture of
235 woody plants with food crops can reduce the productivity of food crops because they
236 compete with each other in the site and lighting. With a narrow level of land ownership,
237 there is no opportunity for the community to conserve land so that it has a negative impact
238 on the management of community forest sustainability. The low level of control of land
239 owned and cultivated land by local communities has resulted in a high economic dependence
240 on the families of tenants/farm labourers to the landowners who live in and outside the
241 community forest. Farm labourers, which account for 50.02% of the total number of farmers,
242 do not have land assets to support their family's physical needs so they try to work in
243 landowners (owner), claimants, and authorized land or work in the sector other or out of the
244 territory.

245 The community conducts forestry activities (in the form of *segon*, *jabon*, and *africa*
246 plants), agroforestry and agriculture (in the form of food crops, ornamental flowers,
247 vegetables, fruits, and other perennials), fisheries (in the form of fish ponds), livestock (in
248 the form of chickens and goats), and other productive cultivation activities. Among the
249 cultivated forest plants, there are intercropping plants including corn, sweet potatoes,
250 cassava, and other food crops. Crop productivity per season for rice reaches 6.3 tons/ha,
251 sweet potatoes 12 tons/ha, cassava 17 tons/ha, corn 4 tons/ha, and peanuts 1.25 tons/ha. Food
252 crops, vegetables, and fruits that are cultivated by the community are not carried out
253 intensively. The production of non-timber farmers is mostly for daily needs. While timber
254 farmers' production, tends to be difficult to compete. According to Racevskis & Lupi (2006),
255 competitively in business, rural, timber-dependent community members are very concerned
256 about the continued provision of both market and nonmarket forest outputs.

257

258 **Farmer's family income** The source of farmers' income, if viewed by stratification of land
259 area, shows that the more land cultivated, the more land-use for various types of plants
260 (Figure 3). According to (Saihani, 2011), the area of land that is managed has an effect on
261 the amount of income received by community forest owners, the more land area the greater
262 the income received so as to be able to meet the needs of their families. Fikir et al. (2016)
263 stated that significant variation was also found among income groups: households with
264 higher total annual income obtain more forest income than those with lower income, but
265 they are relatively less dependent on forest products. Besides, various socioeconomic factors
266 were found to influence forest and land income and dependency.

267 In the forest farmer households that process land in the strata III group, they tend to use
268 their land for agroforestry activities. Conversely, farmers in the strata I group are more
269 balanced between land-use for timber and agroforestry. In the three strata groups, there was
270 almost a common tendency, where farmers provided land-use allocation for agroforestry
271 activities. In general, the contributions obtained from the results of agroforestry are very
272 helpful in fulfilling daily needs. Dev et al. (2003) also emphasize on the access of poorer
273 households to essential forest products for their subsistence. In fact, in most developing
274 countries, desires on community forestry are markedly linked to meeting basic needs and
275 serving subsistence purposes, and therefore the benefits to the community is achieved by
276 extracting them directly from the forest (Glasmeier & Farrigan, 2005). According to
277 Suharjito et al. (2003), if the amount of contribution provided by agroforestry is 10 per cent

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278 of the total income of agroforestry activities then it is considered very helpful in meeting
279 needs.

280 Based on the results of a questionnaire survey of 70 respondents, data was obtained that
281 the income of community forest farmers came from the main activities of farming with an
282 average tenure of 0.17 ha and 0.45 ha of arable land and additional income from buying and
283 selling (*warung*), farm labourers, and other additional income. The income of the farmer's
284 family (with the number of members of 4 people) is an average of USD192.5/month. The
285 lowest income is USD7.50/month and a maximum of USD236/month. This average income
286 is still below the 2018 Bogor UMR (regional minimum wages) value of USD376.34/month.
287 This is caused by the limited land owned and cultivated land only covering an area of 0.31
288 ha (<0.5 ha).

289
290 Farmers' income with land ownership of 1.0 ha from sengon (*Paraserianthes falcataria*)
291 wood averaged USD45.2/month, mahogany (*Swietenia mahagoni*) USD15.3/month, and
292 africa (*Maesopsis eminii*) USD6.7/month. Farmers' income from cultivating food crops (rice,
293 sweet potatoes, cassava) averaged USD48.55/month. The income from vegetable farming
294 and fruit is an average of USD56.5. The income of farmer families who conduct a business
295 shop with a size of 2x3 m² at USD41/month, and become farm labourers of USD45/month.
296 Another productive activity is to do 5-10 goat breeding activities and 5x10 m² size ponds,
297 each earning an average of USD66/month and USD53.5/month. The sources of farmers'
298 income are presented in Table 3.

299 The income of these farmer households is still below the minimum physical requirement
300 (KFM) to meet basic consumption needs of USD1088/year or USD90.7/month. This income
301 is also below the regional minimum wage (UMR) of Bogor in 2018, which is
302 USD376.34/month. Decent living needs (KHL) for families with 4 (four) members
303 amounting to USD272/year or USD226.7/month. The calculated value of KHL per capita is
304 calculated based on the expenditure of community households equal to the value of 800 kg
305 of rice per person per year based on the average benchmark price for minimum physical
306 needs (KFM) of 320 kg, education, health, and social respectively 161.31 kg (Sinukaban,
307 2007). The level of income when compared with the values of KFM and KHL, the
308 community forest farmers community in Bogor can be classified as a condition that is less
309 prosperous. The KHL analysis of Bogor farmers is presented in Table 4.

310 Farmers' income is spent on eight main needs, namely purchasing food staples 58.05%,
311 operational costs for school children 20.13%, PLN electricity 8.01%, procurement of
312 clothing 2.07%, health maintenance 6.43%, social activities 3.07%, home improvement
313 1.22%, and purchase of hoe farming equipment and other 1.02%. Most of the income of
314 farmer households is spent on meeting basic food needs and operational costs of school
315 children.

316

317 **Community forest farmer group** Based on data from the fisheries and forestry agricultural
318 extension centre (BP3K) community forest farmer groups (KTHR) in Bogor there were 312
319 farmer groups and spread in 12 sub-districts. BP3K is an extension institution at the sub-
320 district level formed by the government as a centre of excellence for farmers by extension
321 workers in the field. Farmer groups are engaged in agriculture and forestry. In Bogor,
322 forestry activities include timber products such as *sengon* (*Paraserianthes falcataria*),
323 mahogany (*Swietenia mahagoni*), *africa* (*Maesopsis eminii*), etc., and non-wood such as
324 nutmeg, coffee, cloves, and others. Activities in the forestry sector also include fertilizer-
325 making activities for making forest nurseries, making terraces, agroforestry and conserving
326 other lands and water. Based on the type of business, soil conservation activities include
327 vegetative activities and civil engineering.

328 Agricultural activities are cultivated in the form of food crops such as crops, rice, cassava,
329 sweet potatoes, and others. Livestock activities and inland fisheries in the form of raising
330 goats and carp, and cultivating mushrooms, organic grass, elephant grass, and others. The
331 findings of this study echo those of Gill et al. (2010) and Abrams & Bliss (2013), state that
332 amenity landowners continued, broadly, to institute land-use characteristic of traditional
333 productivist practices: farming, livestock grazing, and timber harvesting.

334 The number of farmer groups who are interested in vegetative activities is as many as 312
335 farmer groups, while the number of farmer groups is interested in civil engineering activities
336 as much as 1 farmer group. Farmers who join forest farmer groups are grouped by level of
337 ability, namely the beginner, intermediate, middle and main groups (Table 5). The results of
338 field observations indicate that there are several farmer groups that are active and
339 independent in their activities, some farmer groups that show a less active attitude, and there
340 are also several other farmer groups just waiting and becoming a place to accommodate
341 government programs. According to Means et al. (2002), decision-making is often based on
342 collaboration, with a consensus emerging from wide-ranging discussions, often fostering
343 local reconciliation.

344

345 ***Landowners from outside the village*** The community groups that own land domiciled
346 outside the forest area dominate land ownership of almost 70-80% with an average area of
347 0.5-2 ha. Most of these community groups come from Jakarta. The land owned by this group
348 is spread in several districts, such as in Babakanmadang, Sukaraja, Leuwiliang, Dramaga,
349 Ciawi, and Cisarua sub-districts. With the high access to transportation, the area in these
350 sub-districts forms a series of settlements or housing and has connected settlement/public
351 housing activities along the Bogor-Jakarta route. Sukwika (2018a) stated that lands
352 belonging to people outside the community forest area are generally used for settlement
353 construction, vegetable cultivation, fruits, medicinal and ornamental plants, and economic
354 value activities. Before the land is used by the owner for residential buildings, generally the
355 land is not cultivated and neglected (idle land) so that it becomes empty land or becomes
356 shrubs and reeds. Land controlled by people outside the forest area in the form of land
357 owned. Some of the lands are entrusted to guards or cultivators, and some are directly
358 controlled by the owner. Peluso (1992) reminded that secure property rights are often a
359 crucial element in creating clear expectations and thereby reducing conflict. But the
360 distribution of property rights also matters. Highly unequal property rights that deprive many
361 people of even the basic means of subsistence can also lead to conflict. This condition is a
362 challenge for policymakers to formulate development models in the natural resource sectors
363 can link with complementary efforts to strengthen the underlying role of equitable
364 governance and secure rights as a foundation for resilient livelihoods (Ratner, 2013). Bohle
365 & Fünfgeld (2007) and Cronkleton et al. (2008) emphasize the concept of a political ecology
366 approach, which emphasizes the positive potential of conflict to spawn social movements or
367 institutional changes that lead to more socially equitable forms of resource use.

368

369 **Local action arena** In 2012, around 20,000 ha of forest land in Bogor were severely
370 damaged, including community forests. Community forest land in Bogor is spread in 40 sub-
371 districts, 18 sub-districts are in a severe category and the worst damage occurs in the western
372 region, precisely in the Cisarua District upland area. Damage generally occurs as a result of
373 land-use change and the increase in villa buildings or hotels that convert forest land into
374 residential land, in addition to the many illegal buildings that are the main cause of forest
375 destruction. The natural beauty and coolness of the area is a special attraction, so many build
376 buildings for resting or other commercial buildings. The proximity and ease of accessibility
377 from and to Jakarta, such as Babakanmadang, Bojonggede, Ciawi, Cileungsi, Dramaga,

378 Jonggol and Parung sub-districts, were the reasons for the conversion of community forest
379 land in the region. According to Verbist et al. (2004) the drivers of land-use change are
380 distinguished by external and internal factors, population growth as external variables and
381 road and infrastructure development (Siregar & Sukwika, 2007), collection of levies or
382 taxes, and land tenure arrangements as internal variables.

383 Environmental damage is a major cause of increased natural disasters such as floods and
384 landslides in a number of areas. Ironically, the ecological destruction caused by forests and
385 watersheds is exploited without control (Hidayat, 2008; Kahn, 2005). The shift in the
386 function of community forests also makes the surrounding area prone to landslides, although
387 there are indeed community forest areas in several sub-districts of Bogor that have been
388 categorized as landslides. The results of the Herawati (2010) study based on the class of TBE
389 (erosion hazard level) 5 showed that there were 10 sub-districts identified as having land
390 areas with very heavy erosion hazard levels, four of which were Pamijahan (80 ha), Ciawi
391 (8 ha), respectively. Cigombong (7 ha), Dramaga (4 ha), Leuwiliang (3 ha). As for the land
392 with the TBE 4 category, 3 of the 16 sub-districts identified as having a land area with severe
393 erosion are Caringin (200 ha), Dramaga (10 ha), Ciomas (5 ha). In these sub-districts so that
394 heavy erosion potential can be reduced, it is necessary to take soil conservation measures
395 and improve soil management, not the other way around, land conversion on the basis of
396 economic value. Change or conversion of forest areas into other forms of use (deforestation)
397 that have high economic values such as agriculture (Ewers, 2006) and residential area
398 development (Jorgenson & Burns, 2007; Nasendi, 2000). Verbist et al. (2004) and Yusuf
399 (2004) indicate that damage to forest areas is caused by several factors, one of which is the
400 problem of changing (transferring) forest areas into other areas. Changes in forest areas can
401 be in the form of changes in designation, namely in the form of exchanging forest areas and
402 releasing forest areas, for the benefit of plantations, transmigration settlements, industries,
403 housing, offices and so on. The change in the function of the forest area is to change the
404 function of the forest area for interests outside the forestry sector (Maladi, 2013). In addition,
405 there is another form, namely the use of forest areas known as forest use loan permits
406 (Siombo, 2014).

407

408 **Transfer of community forest land ownership** The transfer of land ownership in
409 community forests involves the role of a land broker or a local term called "*biyong*".
410 "*Biyong*" generally comes from the local village community, although there are also those
411 from outside the village but still within the community forest area. *Biyong* has an active role

412 in finding information on land that will be sold by local people and seeking information on
413 potential buyers from outside the community forest. In its development, in the 2000s, the
414 share of sales commissions (fees) for “*biyong*” averaged 2.5% of buyers and also requested
415 a number of voluntary commissions from the buyers. According to Sukwika (2018a), there
416 are some “*biyong*” who use the scheme, if there is a seller offering a certain price, for
417 example, USD10 per m², then offered to the buyer with a selling price of USD20 or greater
418 than the original price. With the increase in the price offered by “*biyong*”, “*biyong*” asks for
419 a portion of the voluntary sales commission of 0-2.5% from the seller. Administrative
420 arrangements to complete the sale and purchase agreement starting from RT/RW to sub-
421 districts reached 2.5-5% of the sales value of the land. The role of RT/RW, village to sub-
422 district is to make a statement that the land being traded is not in dispute with other parties.
423 This certificate is generally a guarantee to the buyer that the land to be traded is safe to buy.
424 The role of *biyong* is very important in land ownership, which is to help find buyers for the
425 local community, find land to be bought by the buyer, and provide security guarantees for
426 the land that is traded to the buyer. While Fisher et al. (2018) suspected that land conversion
427 was easy because of flawed land administration processes, entrenched political-economic
428 interests among local actors, and lack of institutional engagement beyond the permitting
429 process. Mendham & Curtis (2010) examine the phenomenon of turnover in rural property
430 ownership by certain actors. Its findings in the form of sales records and spatially referenced
431 rural landholder survey data. Mendham & Curtis (2010) stated that new property owners
432 are significantly different from longer-term landholders in that they own smaller properties;
433 are less likely to be farmers by occupation; are more likely to value conservation over
434 agricultural production, and are less likely to adopt recommended sustainability practices.

435 The level of ownership of land owned and cultivated land by the outside community is
436 wider (70-80%) than the ownership of local communities (20-30%). Communities outside
437 make decisions in managing land owned in community forests. The outside community is
438 more powerful in controlling the behaviour of local farmers who work on their land or they
439 allow their land to become idle land. Gill et al. (2010) state that amenity ownership of rural
440 lands by outside community often implies a blurring of production, consumption, and
441 protection practices rather than a wholesale eclipse of production. Research by Chomba et
442 al. (2015) in community forests found that national forest policies and actors transferred
443 minimal powers that enabled local communities to execute forest protection and
444 conservation roles while maintaining legislative powers and control of economic benefits
445 centrally. Responding to the conditions above, L’Roe & Rissman (2017) considers the need

446 for a partnership strategy in the form of joint forest management (Rangan & Lane, 2001)
447 with local communities. Investor partnership strategies and conservation programs can be
448 shaped by the provision of forest benefits during ownership transitions.

449 Local rules with existing wisdom and land-use rules from the government are no longer
450 able to direct the behaviour of farmers properly. Demand for agricultural commodities and
451 demand for land for villa settlements or tourism businesses has reduced farmland capital and
452 changed the behaviour of farmers to be not conservative. Such conditions cause land
453 resources and water sources to decline. According to Putzel et al. (2015) that development
454 policy, formalization frequently based on current social and environmental norms. However,
455 its adoption is often unsuccessful and entails risks including leakage, barriers to small or
456 poor actors, and negative effects on marginalized groups.

457 Poor environmental quality due to the neglect of problems and environmental impacts in
458 forest development is a major factor in environmental disasters that affect the unsustainable
459 social and economic quality (Kusmana & Sukwika, 2018; Rahman et al., 2017). This places
460 the level of vulnerability of the region to environmental disasters even greater. A study
461 conducted by Skulska et al. (2019) stated that community-based forestry is faced with
462 environmental challenges such as degradation, wildfires and loss of biodiversity. Resolution
463 of these challenges is urgently needed at the legal, administrative and local levels. While
464 Rangan & Lane (2001) highlighted that forest access and ownership made by indigenous
465 communities that have been historically disadvantaged and marginalized from the benefits
466 of mainstream social and economic development. The problem can be approached with joint
467 forest management (JFM). There are three concepts JFM approach scheme are access,
468 control, and substantive democracy to assess the relative strengths and weaknesses of
469 institutional processes that aim to engage in the sustainable management of forest resources.
470

471 ***Farm owner and farm labourers*** Farmers owning land in community forests in Bogor plant
472 areas with wood species such as *sengon* (*Paraserianthes falcataria*), *jabon* (*Anthocephalus*
473 *cadamda*), mahogany (*Swietenia mahagoni*), *africa* (*Maesopsis eminii*), teak (*Tectona*
474 *grandis*), and mixtures. The community is interested in the ownership rights of forest areas,
475 especially for planting *sengon* plants because of the benefits of economic value that can be
476 obtained in it and others. *Sengon* wood species are chosen by farmers because their
477 cultivation has been mastered for generations, has a relatively short life cycle (5-8 years) and
478 has a clear market. Farmers usually sell *sengon* in the form of stands and several types of

479 annual crops such as durian, mangosteen, rubber, coconut, petai, clove and others, besides
480 that there are also rice and secondary crops.

481 Communities that have community forest land play an important role in making decisions
482 about the land they have. Then, if farmers owning community forests have been incorporated
483 into community forest farmer groups, then in relation to decisions in the exploitation of
484 community forests, the farmer's family is the most decisive party. In community forestry,
485 direct forest users are expected play an important role in the common decision making
486 procedures and implementation of forestry activities (Boon, 2000; Charnley & Poe, 2007;
487 Maryudi et al., 2012; Pramono & Aminah, 2010; Sukwika, 2018a). Families also have a
488 dominant role in deciding whether their land will still be maintained as community forests
489 or will be used for other uses. For example, the land originally designated as community
490 forest was diverted to building houses, building infrastructure and other public facilities.
491 Community forests are considered to have high economic, ecological and social values,
492 therefore it is necessary to consider the existence of an institutional model that can play an
493 effective role in preserving community forests, for example, the village government
494 regulates the management of logging permits and the Bogor government controls
495 development in its territory. Further according to Charnley & Poe (2007) that community
496 forestry refers to forest management that has ecological sustainability and local community
497 benefits as central goals, with some degree of responsibility and authority for forest
498 management formally vested in the community.

499 Land ownership in community forest areas is not only owned by local communities, but
500 also from people who live outside community forest areas, even 60% of land ownership
501 rights are owned by people who live outside the community forest area. This community
502 group plays a role in making decisions about the land owned and the land that it controls.
503 Besides that, he also has an interest in controlling his land so that it is safe from other parties'
504 claims (secure property right). In a community group, Putzel et al. (2015) stressed that they
505 also contend with histories of ownership, access rights, market configurations, and practices
506 attached to resources and the lands in which they are located.

507 The type of work of farm labourers in community forest areas is the highest occupancy
508 after farmers. Farmers in community forests are generally farmers, of which there are also
509 those who own their own land, usually less than 0.10 ha. Types of activities carried out by
510 farmworkers starting from land clearing, planting and harvesting. The existence of these
511 community groups is the driver of the implementation of agroforestry activities in
512 community forest areas. Farm workers are often involved because of shortages of labour

513 from within the family. The labour costs of farm labourers in community forests are in
514 accordance with community recognition of USD2.5-3.5 per day.

515

516 ***The level of welfare of the local community*** On the economic aspect, farmers' land tenure
517 in the form of land owned by 0.17 ha and 0.45 ha of arable land only earn an average income
518 of USD231/year or USD192.5/month. This average income is still below the 2018 Bogor
519 regional minimum wage value of USD376.34/month. This is caused by the limited land
520 owned and cultivated land only covering an area of 0.31 ha (<0.5 ha). The standard of decent
521 living needs (KHL) for families with 4 (four) members is USD272/year or USD226.7/month.
522 The value calculated from the KHL per capita is calculated based on the expenditure of the
523 community household equal to the value of 800 kg of rice per person per year based on the
524 average benchmark price for minimum physical needs (KFM) of 320 kg, education, health
525 and social respectively 160kg (Sinukaban, 2007). Based on the level of income, when
526 compared with the values of KFM and KHL, the community forest farmers in Bogor can be
527 classified as under-prosperous.

528 For smallholding forest farmers, community forestry businesses generally become the
529 main source of income. Farmers' household income can reflect their household economic
530 condition. The high and low level of household income can be used as one indicator of the
531 level of welfare of a household. The level of income is influenced by the number of types of
532 business carried out by farmers. Tree ownership also creates more permanent rights to
533 farmland and is prestigious in the community. (Khususiyah et al., 2010; Maryudi et al., 2012;
534 Rahman et al., 2017; Sukwika et al., 2016; Sukwika et al., 2018). Farmers' income in the
535 community forest area of Bogor comes from income sources in the form of: timber products
536 averaging USD22.4/month for ownership of an area of 1.0 ha, food crops on average
537 USD48.55/month, vegetables and fruits on average an average of USD6.5/month, a house
538 stall business with a size of 2x3 m² of USD45/month, and being a farm laborer of
539 USD45/month. Other productive activities from raising 5-10 goats and 5x10 m² ponds each
540 earn an average of USD66/month and USD53.5/month.

541 Referring to the income from some of these farming activities, farmers in community
542 forests can be classified as poor or not prosperous. With these poor conditions, the behaviour
543 of farmers is not able to finance their family members to continue their education to a higher
544 level. Current conditions, according to data from 70 respondents, the education level of
545 community forests are classified as low educated with the majority of elementary and junior

546 high school education (84.29%). With narrow land ownership, low education, and relatively
547 small family income, the tendency of community behaviour in farming is more exploitative.

548

549 **Conclusion**

550 **The performance** of community attributes in community forest areas is classified as weak
551 because it is not effective in regulating community behaviour to achieve the objectives of
552 community forest management including economic, social and ecological goals. This is
553 indicated by the low performance achieved in community welfare and forest land
554 exploitation, namely the ownership of land resources is very low and almost does not even
555 have land, the level of welfare of local communities including the poor, and public education
556 is relatively low. The biggest contribution to the source of income of smallholding forest
557 farmers comes from the agroforestry sector. On the other hand, the challenge of the
558 community forest farmer family is the level of expenditure of the farmer family is still higher
559 than the monthly income, the number of family dependents is relatively high, and does not
560 have savings for the family. Based on the results of the analysis of the strata of land
561 ownership rights by community forest farmers, 70% of farmers are in the third strata, namely
562 land ownership of fewer than 0.5 hectares, and 41.56% of the community forest farming
563 community groups are classified as landowners.

564

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570

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742 Table 1 Attributes of community forest farming communities

Description	Category	Total	
		n	%
Age	Youth (< 41 years)	18	25,71
	Middle Age (41 - 56 years)	40	57,14
	Old Age (> 57 years)	12	17,14
Total		70	
Formal Education	Low (< 9 years)	38	54,29
	Medium (10 - 12 years)	21	30,00
	High (> 12 years)	11	15,71
Total		70	
Non-Formal Education	Low (< 29 hours)	65	92,86
	Medium (30 - 59 hours)	5	7,14
	High (> 60 hours)	0	0,00
Total		70	
Farming Experience	Low (< 5 years)	4	5,71
	Medium (5 - 10 years)	18	25,71
	High (> 10 years)	48	68,57
Total		70	
Land Area	Narrow (< 0,5 ha)	49	70,00
	Medium (0,5 - 1,0 ha)	15	21,43
	Wide (> 1.0 ha)	6	8,57
Total		70	
Income	Low (< USD 150)	23	32,86
	Medium (USD 150 - 225)	38	54,29
	High (> USD 225)	9	12,86
Total		70	
Number of Family	Small (< 3 people)	11	15,71
	Medium (3 - 5 people)	36	51,43
	Large (> 5 people)	23	32,86
Total		70	

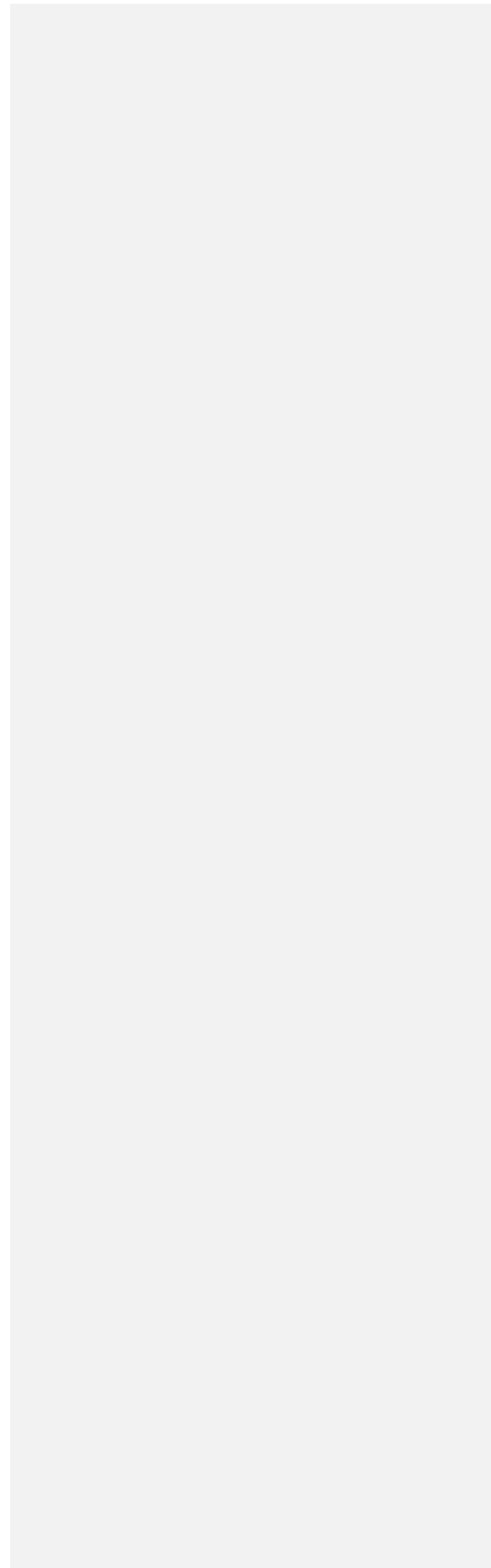
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745 Table 2 Strata of land ownership rights and community forest farming community groups

<i>Community group</i>	<i>Owner</i>	<i>Propieter</i>	<i>Claimant</i>	<i>Autorized</i>
<i>Rights stratum</i>				
Access and withdraw	√	X	√	7.03%
Determine the form of management	√	X		1.39%
Determining participation/ issuing other parties (exclusion)	√	X		
Can trade rights (alienation)	41.56%			
Description: √ = exists, X = none.				
Note: Farmworkers (50.02%) do not have land ownership rights, therefore, they work in landowner groups, claimants, and users (authorized)				

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749 Table 3 Source of income of the respondent farmer's family from agricultural activities
750 and additional activities in community forests

No	Source of income	Income	
		Monthly income (USD/month)	Annual income (USD/year)
1	Sengon, mahoganv, afrika Community Forest	67.20	806.40
		18.47%	
2	Farming vegetables and fruit	48.55	582.60
3	Farm vegetables and fruit	56.55	678.60
Agriculture		28.89%	
4	Farm laborers	31.00	372.00
5	Household stalls	41.00	492.00
6	Sheep breeding 5-10 tails	66.00	792.00
7	Fish ponds	53.50	642.00
Etc.		52.64%	

751 Table 4 The necessities of life are worthy of community forest farmers the necessities of
752 life are worthy of community forest farmers
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No	Expenditures Type	%	Rice (Kg)	Price of rice* (USD /Kg)	Expend i-tures (USD /Fam /Year)	Numbe r of family membe rs	Needs (USD /Fam /Yr)	Needs (USD /Fam /Mon)
<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>	<i>g</i>	<i>h</i>	<i>i</i>
		% <i>d</i>	<i>d x e</i>			<i>e x f</i>		<i>f/12</i>
1	KFM	10 0	320	0.71	227.2	4	161.3 1	18.9
2	Education	50	160	0.71	113.6	4	80.66	9.5
3	Health	50	160	0.71	113.6	4	80.66	9.5
4	Social, Saving, etc.	50	160	0.71	113.6	4	80.66	9.5
5	KHL	25 0	800	0.71	568.0	4	403.2 8	47.3

754 Note: *) Average price of consumption (medium) rice in Bogor 2018

755 Table 5 Data recapitulation of forest farmer groups
756

No	BP3K / Groups	Level of group ability				Total	number of members
		B	A	I	M		
1	Cariu	18	16	3	0	37	868
2	Jonggol	8	22	14	0	44	1676
3	Gunung Putri	13	1	1	0	15	248
4	Cibinong	14	40	7	1	62	1018
5	Ciawi	8	8	2	0	18	524
6	Caringin	18	7	0	0	25	885
7	Dramaga	10	4	2	0	16	375
8	Cibungbulang	1	21	9	0	31	892

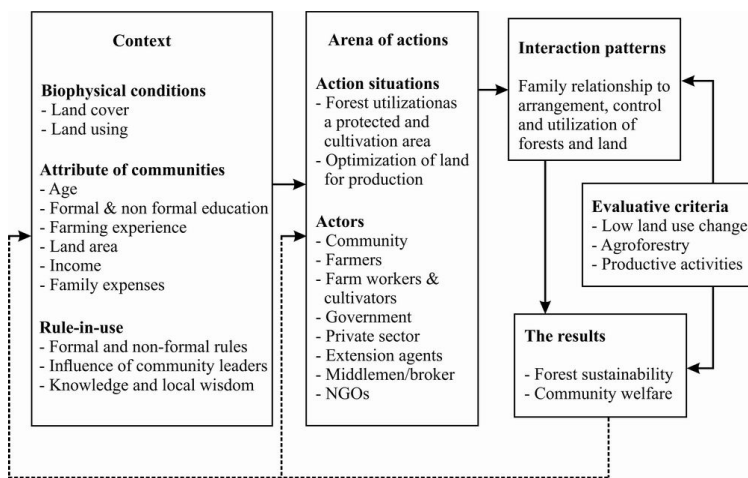
9	Leuwiliang	4	14	2	1	21	1051
10	Cigudeg	4	11	0	0	15	614
11	Parung Panjang	6	10	0	0	16	587
12	Ciseeng	3	6	2	1	12	243
TOTAL		107	160	42	3	312	8981

Note:

B: Beginner Group I: Intermediate Group

A: Advanced Group M: Main Group

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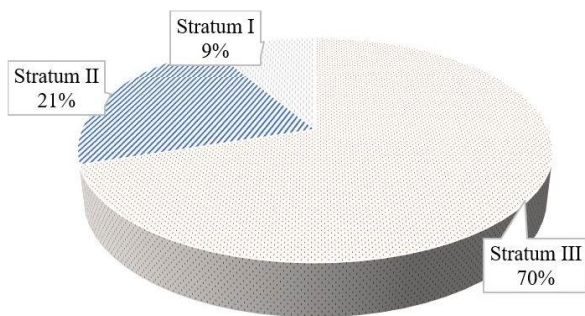
Source : Adopted from Ostrom (2005) and Di Gregorio et al. (2008), with modification

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Figure 1 Arena of action for community forest management action.

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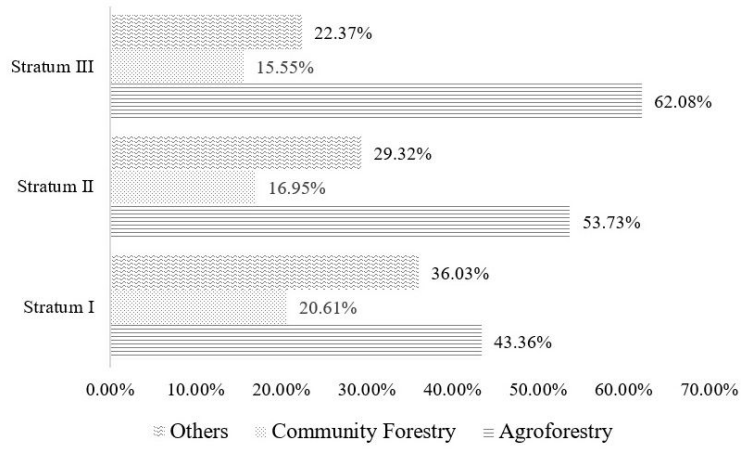
N=70: Average farmer's land area = 0.36 ha

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Figure 2 Strata of land ownership by community forest farmers.

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770 Figure 3 Contribution of the source of income to community forest farmer households.

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