Full Length Research Paper

Poor farmers’ less access to education and health services: a case study of corn farmers in Sigi, Indonesia

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This study aims to identify the productive age and income of corn farmers in Sigi District, Indonesia, and their access to education and health services. The method used in this research is that of mixed methods, which use survey and direct interview with the respondents through a descriptive approach based on quantitative and qualitative data. Determination of corn farmers’ income takes into account the factors and production facilities used. For the perception data on access to education and health services, a Likert scale ranging from 1 to 5 that determines negative and positive grades was used. The results showed that productive age reaches 68.29% but has no significant relationship with the level of income. Narrowness of agricultural land and absence of support through optimal production facilities are the main factors of low production and income among corn farmers. Corn farmers’ average income is Rp 3,254,666/ha for every harvest season, which is very inadequate to meet the needs of their respective families. Structural poverty is difficult to change. Corn farmers’ financial incapacity limits their access to education and health services. A total of 24,309 children aged 5 to 15 has dropped out from school, and non-medical treatment is the only option for poor farming families. The local and central government should focus and implement a sustainable policy to break this cycle of structural poverty in Sigi District, Central Sulawesi, Indonesia.

Key words: Poor farmers, corn farmers, public health, education services.

INTRODUCTION

Indonesia, which is transforming into a semi-industrial nation from being an agrarian country, continues to restructure its system in all sectors and economic bases. Agriculture, which is the government’s main sector that sustains and stabilizes the country’s foreign exchange, has received less attention in the national macroeconomic policy. Many commodities can be sources of foreign exchange if the plan is to focus on increasing the production and development of derived products. One commodity that has a large market share is corn; in fact, it has a global market share (Yamauchi and Dewina, 2012; Rasmussen et al., 2017). Corn
kernels are excellent sources of carbohydrate, protein, and vegetable fat and can be processed (Chen and O'Mahony, 2016; Savari et al., 2018; Murphy et al., 2018) as raw feed material (He et al., 2018). Maize is still directly consumed in a number of regions in Indonesia, including Madura, Southeast Java, southern coast of Central Java, Yogyakarta, southern coast of West Java, eastern part of South Sulawesi, Southeast Sulawesi, Gorontalo, Bolaang Mongondow, North Maluku, Karo, Dairi, Simalungun, Nusa Tenggara Tumur, and parts of West Nusa Tenggara (Suprapto dan Marzuki, 2005).

The current national maize production is 18,506,000 tons with a harvest area of 3,820,000 ha (BPS, 2015). This production is still relatively low compared with those of other countries in Asia and Australia (Bernacki, 2018; Dowd et al., 2018). This low production of corn commodities, in addition to farmers’ poor farm management skills (Morgan et al., 2010, Orsi et al., 2017), results in non-optimal allocation of resources, especially when considering production factors (Mishra et al., 2018), which have a direct impact on yields during the harvest season (Mendoza et al., 2017; Etemadi et al., 2017). This low production of corn underscores the necessity of a national policy for importing products from other countries. Low production and high family needs are economic conditions currently faced by corn farmers in Central Sulawesi. This unincreasing amount of maize production is a serious threat to family resilience and can threaten the welfare of farmers and their families (Warsana, 2007; Perkins et al., 2013; Sajadian et al., 2017; Belke et al., 2013; Hochman et al., 2014) and results in an imbalance between supply and demand (Belke et al., 2013; Huang et al., 2017).

Efforts to increase maize production at the farm level require the coordination of farmers, farmer groups, extension workers, the local government, and the central government. Farmers desperately need real support from various parties, especially national policies for obtaining production facilities, such as fertilizers, pesticides, and markets, by having Dolog accommodating their production. The price game that middlemen play is one factor that makes farmers lose their bargaining position because, on one hand, they need funding support for their production, and on the other hand, bank access is poor because of the conditions that are difficult to meet, which include land certificates as collateral.

Banks’ distrust of farmers requires a special policy from the central government so that farmers have access to loans for their small businesses. Low-interest loans can help farmers increase their production (Garel and Petit-Romec, 2017; Zhang et al., 2018a; Karaivanov and Kessler, 2018), which could have a direct impact on their income and welfare (Qiao et al., 2018; Blumberg, 2018). Corn farmers in Indonesia are generally ignored; in fact, even the government does not care about their suffering. The economic downturn that farmers experience has an impact on their families (Li et al., 2013; Goldsmith et al., 2018). The hardest challenge that farmers face is access to optimal health and education services (Kevric et al., 2018; Green et al., 2018; Barlogis et al., 2018). Their inability to pay for doctors’ services, their remote access to primary health-care centers, and the high prices of medicines are the major conditions that they complain about, especially in Central Sulawesi. Also, families’ financial constraints force a number of children to drop out (Li et al., 2013; Goldsmith et al., 2018). Farmers find it difficult to break free from the cycle of poverty without support from the government (Wishanti, 2015; Qi and Wu, 2016; Andersen, 2017; Robinson et al., 2018). In Central Sulawesi, poverty is still widespread, as per capita income in the region indicates, and has a serious impact on the children of farmers. In Indonesia, as many as 3.5 million children (1.4 million primary school and 2.1 million junior high school) aged 6 to 15 do not have access to education (UNICEF, 2012), and approximately 40% or 1.4 million of them are farmers. Without a clear and fair program for Indonesian farmers, the number of school dropouts could increase (Farahati et al., 2003; Goldsmith et al., 2018), resulting in even more serious social impacts such as poor health and increased crime rates (Walsh and Yun, 2017; Meloni, 2014).

The agricultural sector, especially corn farming, can be a major strategy for improving the economic conditions of the people and increasing their purchasing power (Humphries et al., 2012; Perkins et al., 2013; Kyaw and Ng, 2017). Increasing people’s purchasing power through strong maize farming has been undertaken by the Central Sulawesi local government, although it is not yet sustainable. Focused planning by decision makers is a major factor for long-term economic reforms for farmers, which could improve the economic conditions of farmers’ families (Qiao et al., 2018; Blumberg, 2018). Corn farmers in Central Sulawesi have been subsistence farmers, even though cornlands are vast in 13 districts, but the law is unclear about the subject of ownership (Bappeda, 2016).

This study aims to determine the income of corn farmers and the main factors of poverty experienced by these farmers in Sigi, Central Sulawesi, Indonesia, as well as the barriers to their families’ access to education and health services.

**METHODOLOGY**

**Delimitation of the study**

This study focuses on corn farmers in Sigi Regency that is linked to the level of access of corn farmers to health and education services. This is necessary because the health report of Sigi District shows that access to health services is very low and the level of community education is also low. In addition, the Government has provided basic health and education services including free for
poor families. Therefore, the results of this study can contribute a policy to the government for the family farm in Sigi District that can take advantage of health services and decent education.

Research design

This is a descriptive research that uses mixed methods based on qualitative and quantitative data.

Geographical area

This research was conducted in Sigi Regency by taking 3 districts namely Sigi Biromaru, Dolo, and South Dolo as shown in Figure 1.

Target population

The population of farmers who grow corn in Sigi is estimated to be 36,715 spread across 15 districts. A sample of 300 farmer respondents who are active in the corn farming business was formed from 3 sub-districts using the following approach:

\[
n = \frac{N}{1 + Ne^2}
\]

Where

- \(n\) = Sample size
- \(N\) = Population
- \(e\) = Tolerance of inaccuracy (15%)

Based on the calculation results, the following numbers of respondents were proportionally obtained from each region: Sigi Biromaru, 121; Dolo, 114; and Dolo Selatan, 65.

Data collection

Factual and actual data, and information obtained through direct field observation include respondent characteristics, factors influencing maize production, income, farmers’ economic condition, education, and health of the corn farming family. Secondary data were
Table 1. Population in Sigi Biromaru, Dolo, and South Dolo by Age Distribution.

<table>
<thead>
<tr>
<th>Age (Year)</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–4</td>
<td>4,125</td>
<td>4,644</td>
<td>8,769</td>
</tr>
<tr>
<td>5–9</td>
<td>4,023</td>
<td>3,898</td>
<td>7,921</td>
</tr>
<tr>
<td>10–14</td>
<td>3,052</td>
<td>3,921</td>
<td>6,973</td>
</tr>
<tr>
<td>15–19</td>
<td>4,626</td>
<td>4,789</td>
<td>9,415</td>
</tr>
<tr>
<td>20–24</td>
<td>4,010</td>
<td>2,939</td>
<td>6,958</td>
</tr>
<tr>
<td>25–29</td>
<td>3,243</td>
<td>3,673</td>
<td>6,916</td>
</tr>
<tr>
<td>30–34</td>
<td>2,106</td>
<td>3,889</td>
<td>5,995</td>
</tr>
<tr>
<td>35–39</td>
<td>2,959</td>
<td>2,818</td>
<td>5,777</td>
</tr>
<tr>
<td>40–44</td>
<td>3,492</td>
<td>2,789</td>
<td>6,281</td>
</tr>
<tr>
<td>45–49</td>
<td>2,269</td>
<td>2,332</td>
<td>4,601</td>
</tr>
<tr>
<td>50–54</td>
<td>3,174</td>
<td>1,962</td>
<td>5,136</td>
</tr>
<tr>
<td>55–59</td>
<td>1,005</td>
<td>959</td>
<td>1,964</td>
</tr>
<tr>
<td>60–64</td>
<td>989</td>
<td>768</td>
<td>1,757</td>
</tr>
<tr>
<td>65+</td>
<td>781</td>
<td>991</td>
<td>1,772</td>
</tr>
<tr>
<td>Jumlah</td>
<td>39,863</td>
<td>40,372</td>
<td>80,235</td>
</tr>
</tbody>
</table>

Source: Sigi Biromaru, 2015

Gathered from various sources, at the regional, national, and international levels. Proportate random sampling was used to determine the respondents of the research.

The respondents will either be interviewed or answer questionnaires about the conditions of their respective families. In addition, key informants will be sources of policy information for every research area. Reinforcement from primary data from the field will be combined with the study of the literature relevant to the conditions of farming and respondent farmers. To know the respondents’ income from corn farming in Sigi District, the following equation was used (Soekartawi, 2002):

\[
\pi = TR - TC
\]

where

\[
\pi = \text{Income (Rp)}
\]
\[
TR = \text{Total revenue (Rp)}
\]
\[
TC = \text{Total cost (Rp)}
\]

where

\[
TR = \text{Total revenue} = \text{Production} \times \text{price (P.Q)}
\]
\[
TC = \text{Total cost} = \text{Variable cost} + \text{fixed cost (FC+VC)}
\]

(Soekartawi, 2002).

Corn farmers’ families’ access to education and health services will be determined using a survey method that employs a Likert scale: 1 = very low; 2 = low; 3 = intermediate; 4 = high; 5 = very high.

Data analysis

Data was analyzed using descriptive statistics and frequency with SPSS program.

RESULTS

Condition of corn farmers’ age

Progress of a region is determined by many factors, including resources owned, such as natural and human resources. Existence of a population is very important both as an object and as a subject of development. Based on data gathered from the 3 sampling districts in Sigi, the population in the area was 80,235, 80% of whom are farmers working on an average land area of less than 1 ha. Although some of them have only 0.5 ha, others have up to 3.0 ha. The age distribution of the population in Sigi Biromaru, Dolo, and South Dolo is presented in Table 1.

Table 1 shows that from the 3 sub-districts, most individuals belonged to the productive age category, with 54,800 people or 68.29%. The data show that if these people are very motivated and have high morale, the production of corn farming families will increase as expected.

Farmers’ income

After all the factors and production facilities used were considered, the average income of farmers was determined to be Rp 3,254,666.7 per hectare during every planting season. Sigi Biromaru is one of the sub-districts where the sample has the highest income, as presented in Table 2.
Table 2. Average income of corn farmers per harvest season in Sigi District.

<table>
<thead>
<tr>
<th>Sub-district</th>
<th>Production (kg/ha)</th>
<th>Unit Price (Rp/kg)</th>
<th>Income (Rp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sigi Biromaru</td>
<td>900</td>
<td>4.000</td>
<td>3,600,000</td>
</tr>
<tr>
<td>Dolo</td>
<td>850</td>
<td>3.900</td>
<td>3,315,000</td>
</tr>
<tr>
<td>Dolo Selatan</td>
<td>740</td>
<td>3.850</td>
<td>2,849,000</td>
</tr>
<tr>
<td>Total</td>
<td>2,490</td>
<td></td>
<td>9,764,000</td>
</tr>
</tbody>
</table>

Average 3,254,666.7

Source: Interviews with corn farmers (Compilation), 2017

Table 3. Frequency of corn farmers’ families’ access to education service in Sigi.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Location</th>
<th>N</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sigi Biromaru</td>
<td>121</td>
<td>60 (49.58%)</td>
<td>31 (25.62%)</td>
<td>24 (19.83%)</td>
<td>4 (3.3%)</td>
<td>2 (1.65%)</td>
</tr>
<tr>
<td>2</td>
<td>Dolo</td>
<td>114</td>
<td>41 (35.96%)</td>
<td>25 (21.92%)</td>
<td>32 (28.07%)</td>
<td>10 (8.77%)</td>
<td>6 (5.26%)</td>
</tr>
<tr>
<td>3</td>
<td>Dolo Selatan</td>
<td>65</td>
<td>27 (41.53%)</td>
<td>17 (26.15%)</td>
<td>13 (20%)</td>
<td>5 (7.69%)</td>
<td>3 (4.61%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>300</td>
<td>42.35%</td>
<td>24.56%</td>
<td>22.63%</td>
<td>6.58%</td>
<td>3.84%</td>
</tr>
</tbody>
</table>

Source: Results of interviews with corn farmers’ family (Compilation), 2017

Table 4. Corn farmers’ families’ frequency of access to health service in Sigi.

<table>
<thead>
<tr>
<th>Location</th>
<th>N</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sigi Biromaru</td>
<td>121</td>
<td>52 (42.97%)</td>
<td>31 (25.61%)</td>
<td>17 (14.04%)</td>
<td>12 (9.91%)</td>
<td>9 (7.43%)</td>
</tr>
<tr>
<td>Dolo</td>
<td>114</td>
<td>39 (34.21%)</td>
<td>16 (14.03%)</td>
<td>42 (36.84)</td>
<td>11 (9.65%)</td>
<td>6 (5.26%)</td>
</tr>
<tr>
<td>Dolo Selatan</td>
<td>65</td>
<td>15 (23.07%)</td>
<td>18 (27.69%)</td>
<td>14 (21.53)</td>
<td>13 (20%)</td>
<td>5 (7.69%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>300</td>
<td>33.41%</td>
<td>22.44%</td>
<td>24.13%</td>
<td>13.18%</td>
<td>6.79%</td>
</tr>
</tbody>
</table>

Source: Interviews with maize farmers (Compilation), 2017

Farmers’ families’ access to education service

The low income of corn farming families in Sigi District is related to access to education services. Table 3 shows that, in general, access to education is low by the family of corn farmers; that is, very low (42.35%) and low (24.56%). Since it states that high access is only 6.58%, then the areas that have low access to education; that is, Sigi Biromaru and South Dolo are 49.58% and 41.53%, respectively. This shows that corn farmers in Sigi district are less able to access the education provided by the government.

Access of corn farmers to health services

Public health is a primary need that determines a person’s productivity, as well as a farming community’s. To maintain the health of the farming community, in addition to maintaining personal and environmental health, primary health-care facilities must be accessible so that the basic rights of citizens are guaranteed. Guaranteeing people’s right to health services in Central Sulawesi, including in Sigi District, has not met expectations. Survey results on corn farmers’ access to health services have relatively similar results on their access to education.

Table 4 indicates that 79.98% or 240 corn farmers claim to have very-low to moderate access to health services, while only 20% or 60 people claim to have high to very-high access to these services. The highest perception percentage is for very low service access, which is 33.41%, while only 6.79% of the farmers indicate very high service access.

DISCUSSION

Distribution of the range of productive and nonproductive ages is important in estimating one’s motivation and creativity (Sözbilir, 2018; Ngai et al., 2016; Hank and Stuck, 2008). The age of farmers as workers in the
production sector is correlated with their ability to carry out daily activities (Luo and Chui, 2016; Börsch-Supan and Weiss, 2016; Orsi et al., 2017), which require physical strength, from land preparation to harvesting (Nuthall and Old, 2018a; Adonteng-Kissi, 2017; Ayal and Leal-Filho, 2017; Börsch-Supan and Weiss, 2016). Based on data released by the WHO, the human productive age ranges from 15 to 64; people in this age range can still work and run their activities well (Sözbilir, 2018; Hank and Stuck, 2008). A total of 54,800 people or 68.29% are still in their productive age in Sigi District, based on the 3 sub-district samples. This indicates that farmers in the area can still grow their corn farming business. Nevertheless, based on the production data obtained and associated with the productive age of corn farmers in Sigi District, no correlation was observed. The number of productive ages does not guarantee the amount of production.

Many factors determine the production and productivity of a business (Zhang, 2018; Kumar et al., 2014; Meraner et al., 2015), including skills, motivation, and climatic conditions (Trinh et al., 2018; Kumar et al., 2014; Meraner et al., 2015), as well as production factors, such as land area, labor, and capital (Saygili, 2017; Gong et al., 2017), and production facilities, which include seeds, fertilizers, and pesticides (Akullo et al., 2018; Gong et al., 2017; Brecher et al., 2016). Narrow lands averaging less than 1.0 ha cultivated by corn farmers are one of the factors that complicate extensification efforts, in addition to climatic factors that are beyond human control. Agricultural land as a production factor (being an arable land) and lease are one of the biggest expenditures that must be borne by farmers (Hardaker, 2018; Kyaw and Ng, 2017; Andersen, 2017). Many corn farmers find it difficult to gain real advantage because of high expenditures that are not directly related to the production process. Land taxes, whose amount varies depending on the policies set by the village administration, must also be borne by the farmers. The higher the expenditure, the greater the burden borne by the farmers, thereby reducing their income, which they need to meet their families’ daily needs (Mendoza et al., 2017; Orsi et al., 2017; Goulet, 2013). An income of not more than Rp 5 million/ha per harvest cannot change the lives of the corn farmers in Sigi District.

These corn farmers have been experiencing this poverty, also known as structural poverty, for generations (Etemadi et al., 2017; Barlogis et al., 2018). It can be asserted that productive age and innovation are not always relevant (Rasmussen et al., 2017; Orsi et al., 2017; Luo and Chui, 2016). The lazy culture of self-development and creativity is a psychological constraint in the farming community (Green et al., 2018; Shin et al., 2017), as shown in the case of maize farmers in Sigi District. Poor work ethics and lack of production factors with means have complemented the process of impoverishment in farming families (Makuvaro et al., 2018; Aicardi et al., 2018; Hussey, 2011).

Structural poverty is difficult to change without any government intervention by opening marketing access, raising the selling price of corn products from farms, and stressing the importance of support for agrarian reform (Qi and Wu, 2016; Neaime and Gaysset, 2018) so that farmers obtain legal certainty of their land ownership. Corn farmers’ non-creativity is psychosocially caused by unclear ownership rights to lands they are working on (Irwin and Poots, 2015; Nuthall and Old, 2018b). The low income of corn farmers has systemic impacts on all family aspects (Ton et al., 2018; Norman, 2015), including access to education, because of their inability to bear the needs of their children (Stotz and Lee, 2018; Jeong et al., 2017).

The reality of most 6- to 15-year-old children of farmers dropping out is particularly distressing. In the three sample sub-district areas, 33,078 primary school children are at risk of dropping out. Uneducated people aged 10 to 19 represent a threat of diminished uneducated productive children in the future (Farahati et al., 2003; Michalscheck et al., 2018). People who have low education generally find it difficult to accept new innovations (Tarlea and Freyberg-Inan, 2018; Tang, 2018), including innovations for improving the management of corn farming in Sigi District. In addition, changing one’s skills and thinking capacity is necessary (Dolinska, 2017), and education is one of the factors that can influence one’s thinking (Dahmann, 2017; Salavera et al., 2017; Papalexopoulou et al., 2014).

Farmers in Sigi District, who mostly finished junior high school (SMP) or received lower education, become obstacles in the communication between members of farming groups and agricultural field extension (PPL). Counseling needs to be done to help them understand the importance of improving soil fertility and preventing the land degradation process to maintain the productivity of the land (Basir-Cyio et al., 2012). The Indonesian government has implemented a national policy that guarantees free tuition for children aged 6 to 12, but tuition is only one of the costs incurred by students. Uniform, transportation, and unofficial levies are financial components not borne by the government. As a result of the expansion of Donggala District, Sigi District is still constrained by the conditions of infrastructures, namely, roads and bridges and public transport to access villages. Lack of roads and bridges adds to the poor mobility of goods and people, causing the prices of daily necessities to increase and making communities difficult to reach (Zhang et al., 2017; Angelstam et al., 2017). Also, agricultural products from farms in remote areas are difficult to market because they are hampered by poor transportation (He et al., 2018; Hodge et al., 2017).

The inability of farmers to cover all educational costs for their children could increase the number of dropouts. A productive age below 20 among school dropouts poses a long-term threat to the development of a region.
(Goldsmith et al., 2018); in addition, these children could be lured to commit crimes if they are not strictly supervised by their parents (Latzer, 2018; Sharkey and Torrats-Espinosa, 2017; Mehmum et al., 2006). In general, no human wants economic poverty, but environmental conditions are crucial (Ogwumike and Ozughalu, 2018; Chen et al., 2018).

Marginal land with respect to soil fertility, narrow land area, and poor access has accumulated as factors driving the process of impoverishment. The powerlessness of an economy can block any access, including access to health services (Poizat et al., 2017; Susanto et al., 2017). Corn farmers in Sigi District complained of poor access to health services. Their inability to pay for health-care services and purchase medicines forces them to choose alternative medicines that are not medically guaranteed. Counseling by medical personnel to convince poor farmers to seek treatment at the community health center (Puskesmas) can increase public confidence in medical services. Cultures that heavily rely on dukuns (traditional medics) reflect a socioeconomic phenomenon (Susanto et al., 2017; Poizat et al., 2017). The social aspect of this phenomenon basically starts from its economic aspect, which begins with the inability to pay for all medical expenses (Qiao et al., 2018; Blumberg, 2018). Continuing conditions can change people’s mind-set about alternative medicine as a rising culture (Poizat et al., 2017; Ali and Rahut, 2018).

The government and the state must be in the middle of these situations by providing various forms of support and convenience, starting with enriching people’s economic resources, exploring income sources from farming, and facilitating farmers to gain more access education and health services. The maize farmers’ quality of life in Sigi District can be changed using various approaches and strategies that could be set forth in local government planning in short-, medium-, and long-term programs, including tackling the most fundamental factors to guarantee land rights, provide production programs, including access to health services (Poizat et al., 2017; Mehlum et al., 2006). In general, no human wants economic poverty, but environmental conditions are crucial (Ogwumike and Ozughalu, 2018; Blumberg, 2018) as part of a family, society, nation, and state.

Conclusion

Narrow farmlands have become one of the causes of low production and income earned by corn farmers in Sigi District. Low revenues result in low purchasing power, making it difficult for them to meet the basic needs of their families. Economic limitations have a direct impact on lack of access to educational services, which contributes to dropout rates among corn farmers’ children aged between 6 and 15. In addition, because of corn farmers’ families’ lack of access to health services, medical treatment is not guaranteed when they have health issues. Alternative medicine has become a rising culture as a direct result of structural poverty. These conditions can be changed if the government implements short-, medium-, and long-term programs to meet the needs of rural communities that are generally experiencing socioeconomic disability.

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