Social capital and maize farmers’ income

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Abstract. Social capital is an investment to get new resources in society. Weak social capital will
dim the spirit of mutual cooperation, exacerbate poverty, increase unemployment, crime, and hinder
any effort in improving the welfare of the population including farmers. Utilizing the potential of
social capital had been able to contribute to improving income of farmers in the rural area. So that,
it is important to analyze the significance of influence in social capital and farmers’ income of maize
in South Sulawesi, Indonesia. Data were collected by structured interview through probability
proportional to 120 of maize farmers as samples which were analyzed by descriptive analysis. Final
resulted showed that social capital through the dimensions of trust, social network and norms had a
positive effect on farmers' income, but the effect was not significant. The dimensions of social capital
owned by new farmers formed a positive attitude that supported and had not directly influenced the
increase of farmers' income, especially the increase in production as the highest dimension of income
generation.

1. Introduction

Economic problems are the biggest problem in every nation including Indonesia. In Indonesia, the problem
in Indonesia is not only how to increase economic growth, but also how to make economic growth evenly
distributed on each island. uneven economic growth will lead to inequality in the rate of economic growth
and inequality in income levels of the community which in turn will have an impact on Indonesian social
and cultural changes, including in terms of social capital [1]. Social capital is a series of processes of human
relations that are supported by networks, norm and trust that enable efficiency and effectiveness of
coordination and cooperation for mutual benefit [2].

Society who has high social capital will open the possibility of solving the complexity of the problem
more easily than low social capital. This happens to people who are accustomed to a high sense of mutual
trust [3]. Social capital noted that social capital that grows in a community that is good and cooperative
behavior based on shared norms will be very helpful in strengthening these community entities [4].
Additionally, social capital also reduces information costs and risk then helps reduce moral hazard and
adverse selection [5].
The condition of social capital in rural and urban areas is different, these conditions are characterized by a system of life that usually groups on a family basis in the rural [6]. Therefore, social capital in rural areas is usually stronger than urban. Generally, rural communities depend their lives on agriculture with small-scale agriculture. Small scale of agricultural business inhibits farmers from increasing their income, so it is difficult to get out of the poverty circle. Poverty that occurs in farmers because of their narrow land area, is also caused by low productivity, limited infrastructure, low accessibility to capital, technology and information.

Relationship with the income, social capital not only effected to the development, but also the straight effect of social capital to the income or welfare [7]. This study examined the impact of social capital on household welfare and poverty in Indonesia. It indicated that a positive correlation between social capital and welfare of households. Households with high social capital have a high per capita income, more assets, more savings and better access to credit.

The highest maize production in Jeneponto Regency reached a harvest area of 47,663 hectares and production of 201,446 tons. The results of the South Sulawesi Agricultural Census in 2013 showed that most families in Jeneponto Regency became farmers (76, 27%) of a total of 59,247 households [8]. Social capital in Indonesian community [9] which has to do with food security identified was the existence of mutual assistance in the form of giving and lending food and exchanging food between neighbors and relatives. The level of trust is still relatively high among community members and the government, especially agricultural extension officers, village heads and community leaders.

Based on the theoretical background and considering the objective of this research mentioned before, we propose a conceptual model that will be tested by empirical data. In this study we attempt to test the links between social capital and farmers’ income. Therefore, the following hypothesis can be proposed:

H1 : Social capital (X) has significant effect to Farmers’ Income (Y)
H0 : Social capital (X) has no significant effect to Farmers’ Income (Y)

2. Methods
This study is formulated by Likert scale which is analyzed by descriptive analysis. Descriptive analysis is a statistic used to analyze data by describing data that has been collected as it is without intending to make applicable conclusions to be generalized. The author will prove hypothesis that has been calculated based on existing data systematically, factually and accurately about the facts, the characteristics and relationships between the phenomena studies. This research was conducted in South Sulawesi, Indonesia. The number of samples taken were 120 maize farmers by probability to proportional size sampling. The first stage is carried out in the form of multistage random sampling; the sample is chosen proportionally from the total population in the sub-district. In the second stage after the number of samples per village was obtained, the sample was chosen by random sampling in one village.

3. Result and discussion
3.1. Social Capital
Social capital referred to trust, norm and social network that had the potential for community productivity. Measurement of social capital variables through observing these three variables. Descriptive analysis was done by calculating the frequency of respondents' answers to questions in each observe variable.

3.1.1. Trust
Trust is the growth of mutual trust between individuals and institutions in society. The measurement of observe variable is carried out on two questions. Each includes the question of openness to other farmers and openness to traders.

### Table 1. Openness to other farmers about good agricultural practice

| Indicator scale     | Frequency (person) | Percentage (%) |
|---------------------|--------------------|----------------|
| Not openness        | 0                  | 0              |
| Little openness     | 20                 | 16.7           |
| Enough openness     | 29                 | 24.2           |
| Openness            | 71                 | 59.2           |
| Very openness       | 0                  | 0              |
| Total               | 120                | 100            |

Table 1 showed that 59.2\% of farmers are open to each other about good agricultural practice. Openness was realized in providing detailed information about the types of superior seeds, the use of fertilizers and pesticides. It also showed that none of the farmers stated that they were not open and very open to other farmers. This indicated that among farmers have trust with other farmers, but not all the information held was conveyed entirely to other farmers. The frequency distribution of farmers' answers regarding trust to traders regarding the assessment of water quality standards is presented in Table 2.

### Table 2. Traders' trusted in assessing water quality standard

| Indicator scales   | Frequency (person) | Percentage (%) |
|--------------------|--------------------|----------------|
| Not trusted        | 0                  | 0              |
| Low trusted        | 23                 | 19.2           |
| Enough trusted     | 20                 | 16.7           |
| Trusted            | 77                 | 64.2           |
| Very trusted       | 0                  | 0              |
| Total              | 120                | 100            |

Table 2 shows that 64.2\% of farmers believe in traders about the measurement and assessment of water content. This belief was shown by giving full authority and trust to traders to measure the water content of maize that would be sold.

### 3.1.2. Networks

Social network is dynamic infrastructures which are in the form of cooperative networks between people. The network facilitates communication and interaction, enables growth of trust and strengthens cooperation. The measurement of the observe variable was carried out on two questions. Questions include cooperative relations between one farmer to other farmers and between farmers and traders. Frequency distribution of farmers answers regarding cooperative relationships between farmers was presented in Table 3.

### Table 3. Inter-farmer cooperation relations
Table 3 showed that 96.7% of good relationships with fellow farmers and 3.3% stated that the relationship was moderate or medium. There were no farmers who are suspicious that the relationship not good, little good and very good. Farmers establish good relationships with fellow farmers. The good relationship was shown by supporting labor, agricultural equipment and machinery, such as hand tractors in cultivation activities, both during planting and harvesting. This is also supported by the calculation of the average weight of 3.97 which was in the very good category.

Good relationships were also cultivated by farmers with collecting traders. This was seen from the provision of assistance in the form of business capital loans to purchase production facilities such as seeds, fertilizers and pesticides. There are even traders who directly provide cash loans for the daily needs of farmers. This loan is based on mutual trust in one another, where farmers believed that the collecting traders provide assistance with low interest, while traders believe that farmers can pay what was done by selling the harvest to the collecting traders. Table 4 describes the frequency of farmers regarding cooperation with traders.

Table 4. Cooperation with traders

| Indicator scales | Frequency (person) | Percentage (%) |
|------------------|--------------------|----------------|
| Not good         | 0                  | 0              |
| Little good      | 0                  | 0              |
| Good enough      | 4                  | 3.3            |
| Good             | 116                | 96.7           |
| Very good        | 0                  | 0              |
| Total            | 120                | 100            |

Table 4 showed that 97.5% of farmers establish good relations with collecting traders. This was also supported by the calculation of the average weight of 3.98 which was in the very good category.

3.1.3. Norms

Norm is understandings, values, hopes, and goals that are believed and carried out. The measurement of the observe variable is carried out on two questions each regarding the understanding of the rules and values that might be adhered together and the attitude towards sanctions against the violations given. Table 5 showed the frequency distribution of farmers’ answers to the rules and cultural values that could be adhered together.

Table 5. Cultural rules and values

| Indicator scales | Frequency (person) | Percentage (%) |
|------------------|--------------------|----------------|
| Not good         | 0                  | 0              |
| Little good      | 0                  | 0              |
| Middle           | 3                  | 2.5            |
| Good             | 117                | 97.5           |
| Very good        | 0                  | 0              |
| Total            | 120                | 100            |

Table 5 showed that 97.5% of farmers establish good relations with collecting traders. This was also supported by the calculation of the average weight of 3.98 which was in the very good category.
Table 5 showed that 90% of farmers have knowledge of the rules and values that should be adhered together. The norms and rules that apply to the cultivation of maize in Indonesia were the beginning of the planting season in the rainy season and on good days determined through farmer group meetings and make timely payments to traders. Planting maize was done in mutual cooperation, taking turns between farmers to help each other. This was also supported by the calculation of the average weight of 3.90 which is in the very good category.

Table 6. Sanction against violation

| Indicator scales         | Frequency (person) | Percentage (%) |
|--------------------------|--------------------|----------------|
| Not accepted             | 0                  | 0              |
| Low accepted             | 4                  | 3.3            |
| Enough accepted          | 12                 | 10.0           |
| Accepted                 | 104                | 86.7           |
| Very accepted            | 0                  | 0              |
| Total                    | 120                | 100            |

Table 6 showed that 86.7% of farmers were willing to accept sanctions applied because they violate the prevailing norms. If there were farmers who plant outside the agreed schedule, farmers would get sanctions such as not being invited back when there was a farmer group meeting. Farmers would be denied sanctioned assistance in planting their plantations, if they did not participate in mutual cooperation planting other farmers. If no payment was made to the merchant, sanctions were given in the form of suspension of lending in the next planting season. The provision of sanctions is quite effective in providing warnings of violations committed. This was also supported by the calculation of the average weight of 3.83 which was in the very accepted.

Table 7. Average of social capital variables

| No | Observe variables | Average |
|----|-------------------|---------|
| 1  | Trust             | 3.43    |
| 2  | Networks          | 3.97    |
| 3  | Norms             | 3.86    |
|    | Average           | 3.75    |
Table 7 showed that the variables perceived high by farmers were social network variables. This indicated that the social capital of maize farmers in Indonesia was supported by strong networks, both farmers and middle men.

3.2. Farmers’ Income
Farmers’ income is all income earned by farmers in maize farming for one year which can be calculated from the sale or exchange of production based on the price per unit of weight at the time of collection. According to Hernanto [10], the amount of income that will be obtained from a farming activity depended on several factors that influence it. The influential factors included land area, level of production, and efficient use of labor. The measurement of income variables included the three things [10] through observing variables namely land area, production and labor. Descriptive analysis was done by calculating the frequency of farmers’ answers to questions in each observe variable.

3.2.1. Land area
Land area is area used to produce maize. The measurement of the observe variable was carried out in one question. The answer distribution was presented in Table 8 below.

Table 8. Land area in maize production

| Indicator scales    | Frequency (orang) | Percentage (%) |
|--------------------|-------------------|----------------|
| Very decreased     | 3                 | 2.5            |
| Decreased          | 13                | 10.8           |
| Stable             | 93                | 77.5           |
| Increased          | 11                | 9.2            |
| Very increased     | 0                 | 0              |
| Total              | 120               | 100            |

Table 8 shows that most farmers have land that has not increased (77.5%). In addition, there were 9.2% which increased and also there were 10.8% which decreased. Some of causes of the decline in land area were due to landslides, sale of land due to economic needs and the transfer of land use from maize to sugar cane in areas that were sugarcane cultivation areas. Meanwhile an increase in land area was due to land expansion either by opening new land or by buying new land.

3.2.2. Production
Production was the result of planting maize which was obtained in one planting season. The measurement of the observe variable was carried out in one question. The answer distribution was presented in Table 9 below.

Table 9. Production in maize farming

| Indicator scales    | Frequency (person) | Percentage (%) |
|--------------------|--------------------|----------------|
| Very decreased     | 0                  | 0              |
| Decreased          | 0                  | 0              |
Table 9 shows that maize production in one production center in Indonesia in the past three years most of 80.0% increased 10-30%, even 5.8% experienced a production increase of more than 30%. This showed that the technicality of maize cultivation managed by maize farmers have ran well. The low age of public education can be covered with a strong desire to develop and high trust in extension workers and the government in guiding the improvement of the farming done.

### 3.2.3. Labor

Labor is a work force that worked in maize farming, both as owners and farm laborers. The measurement of the observe variable was carried out on one question. The answer distribution was presented in Table 10 below.

| Indicator scales         | Frequency (person) | Percentage (%) |
|--------------------------|--------------------|----------------|
| Very decreased           | 4                  | 3.3            |
| Decreased                | 103                | 85.8           |
| Stable                   | 12                 | 10.0           |
| Increased                | 1                  | 0.8            |
| Very increased           | 0                  | 0              |
| **Total**                | **120**            | **100**        |

The labor involved in the maize farming approximately 85.8% decreased 10-30%. As many as 10% stated that the number of labors used was fixed and that increased by 0.8%. Based on the frequency distribution of farmers’ answers, it can be seen that the average of each observe variable was as follows:

| No | Observe Variables | Average |
|----|-------------------|---------|
| 1. | Land area         | 2.93    |
| 2. | Production        | 3.91    |
| 3. | Labor             | 2.08    |
|    | **Average**       | **2.97**|

Table 11 showed that among the three observing variables of income as latent variables, the highest perceived by farmers w production (3.91), followed by land area (2.93) and labor (2.08). The production
variable has an average weight higher than the average weight of all observe variables (2.97). Thus, the observed variable of increasing production became the main variable that influenced the increase income of maize farmers. It significantly influences between land and labor of maize farmers even there is no real influence between capital, farming experience and dependents of the maize farmers income [11].

3.3. The Effect of social capital to the maize farmers’ income

This section deals with evaluating the coefficients or parameters that showed a causal relationship or the effect of one latent variable on another latent variable.

Table 12: Effect of social capital to the farmers’ income

| Structure of relation | Koef. | T. count. | T. tab | P value | Note   |
|-----------------------|-------|-----------|--------|---------|--------|
| Direct Effect         |       |           |        |         |        |
| X to Y                | 0.078 | 1.977     | 1.96   | 0.056   | Non Sig. |

Direct effect of social capital on farmers’ income was only significant at 0.10 level. Social capital was formed from 3 dimensions construct of each trust (0.618), social network (0.619) and norms (0.617). All coefficients had positive effect with almost the same values between the three construct dimensions. Social capital was formed and influenced by constructs of trust with all the indicators. Indicators The social networks that made up social capital were collaborative networks that were established between farmers and traders. Meanwhile, norms were formed from indicators of understanding the existing and running rules in the community and the willingness of farmers to accept sanctions if they violate norms.

Social network had a higher construct coefficient value in forming social capital when compared to trust and norms. This is in line with the average value of farmers’ perceptions of the latent variables of social capital which showed that the highest perception by respondents was the social network variable with value of 3.97. This showed that the social capital of maize farmers was supported by strong networks, both farmers and traders. In another research showed that social capital was significantly influenced by factors such as innovation communication frequency, innovation communication intensity, work motivation, farmer’s attitude, innovation economic benefit value, market availability and rate of adoption of maize innovation. However, in adoption process of maize innovation, farmers’ exposure toward innovation information, human capital, and innovation promotion worked thru social capital [12].

The results of the analysis of the effect of social capital on farmers’ income, showed a coefficient of 0.078 with a t value of 1.977 higher than t table 1.976. Although t count was higher than t table, but because of the probability 0.056 caused not significant at the 0.05 level. The results indicated that social capital through the dimensions of trust, social network and norm had positive influence on farmers’ income, but the influence was still lacking and required support from other variables. The lack of influence of social capital was due to the new dimension of social capital that had formed positive attitude that supports and not directly influenced the forming dimension of the increase in farmers' income, especially the increase in production. Social capital through trust, network and norm also had a positive influence on the formation of attitudes that influence the use of joint labor in mutual cooperation in maize cultivation and harvesting, also loaning agricultural equipment, but these were not enough to increase the maize production.

Research findings that showed insignificant effect of social capital on income, can be seen [13] which showed that social capital had provided the basis for the farming community to the ability to control the use capital of environment, physics, economics, human, politics and information. It means, social capital could not be the main determining factor in increasing economic capital, one of which was characterized by an
increase income, but in synergy among with the use of environmental capital, human capital (networks and trust), political capital and information capital (supply chain).

Social capital did not directly affect farmers' income, but through changes in attitudes and knowledge in agribusiness development efforts, which lead to improved farmers' welfare [14]. Social capital consists of trust, norm and social network in a high category. The attitude of farmers regarding the development of agribusiness system was positive.

The condition of social capital among farmer communities in two study areas could not support the performance of farm collectivity due to financial trauma [15]. The absence of these collectivities made production capacity, quality, and continuity expected to compete in the modern market. Production costs also became inefficient and the welfare of farmers was very low. This meant that social capital was not an easy thing to be immediately repaired or formed suddenly. Social capital was formed slowly, gradually, and required a long period of time. Therefore, the improvement of these conditions could not be done instantly, especially if you hope that farmers could improve the condition by themselves. Thus, there was a need for movement or encouragement from outside parties to help improve this, especially for policy makers in agriculture.

Paying attention of this case, social capital through trust, social network and norm that has been owned by the community, besides needing to be strengthened among farmers and traders, also need to be made an effort to link with other related parties. Specially in Indonesia, can be done through the establishment of coordination and cooperation forums among farmers, traders and the government through facilitators and agricultural extension workers. This forum was expected running well to strengthen the role of social capital in increasing farmers' income.

4. Conclusion
Social capital through the dimensions of trust, social network and norms had a positive effect on farmers' income, but the effect was not significant. The dimensions of social capital owned by new farmers formed a positive attitude that supported and had not directly influenced the increase of farmers' income, especially the increase in production as the highest dimension of income generation.

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