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Competency and Social Capital's Influence on Farmer Welfare: The Moderating Role of Social Capital

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Abstract

This study analyzed the effect of competency and social capital on farmer welfare and the effect of competency on welfare with social capital as a moderating variable. The population was 1758 corn farmers in six districts of Kutai Kartanegara Regency, East Kalimantan Province, Indonesia. The sample size was 240 people determined using the Slovin formula. Primary data was collected using questionnaires distributed to respondents. Respondents were chosen by proportional randomization. The questionnaire consisted of variables and indicators measured using a Likert scale with the lowest score of one and the highest score of five. The questionnaire used has been tested for validity and reliability. Data were analyzed using SEM PartPLS. The results showed that the effect of competence on farmer welfare was positive and significant. The effect of social capital on the welfare of farmers was positive and significant. The effect of competence on welfare with social capital as a moderating variable was negative and significant.

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Introduction

In essence, welfare is the right of all humans, for this reason, the Indonesian government has made various efforts to realize sustainable community welfare. The welfare of farmers needs to be improved due to the extreme climate change conditions and unsustainable agricultural practices in Kutai Kartanegara. Other challenges identified in the area include infrastructure as well as access to the market and agricultural resources. However, farmers are motivated to be profitable, improve their quality of life, and keep ancestral heritage, such as *betulungan etam bisa*. This trend shows that the sustainable welfare is not expected to be confined to urban areas (Khan *et al.*, 2020). Human Development Index (HDI) is a measure of welfare level in several ways, including education, health and income. However, the data from Central Bureau of Statistics (*BPS*) showed that the HDI of East Kalimantan Province was 77.44 in 2022 and Kutai Kartanegara Regency had 74.67 (Central Bureau of Statistics, 2022a). These values provide a clear picture of the welfare conditions in the two areas. The relatively high overall HDI of East Kalimantan and the low value recorded for Kutai Kartanegara show inequality in development. The trend is further identified by Gini ratio of 0.334 for East Kalimantan and 0.283 for Kutai Kartanegara.

The farmer's exchange can measure the welfare level of farmers. Based on data from the Central Bureau of Statistics in November 2022, the farmer's exchange rate for the plantation farmers in East Kalimantan province was 91.82 and for Kutai Kartanegara district was 95.97 (Central Bureau of Statistics, 2022b). Based on this data, it can be summarized that the welfare level of food plantation farmers remains low. The main factor influencing the level of welfare for corn farmers is competence in terms of farming, experience, knowledge of modern agricultural methods, and motivation to work in agriculture. Previous research also reported the significant influence of farmer competence on welfare (Fauzie *et al.*, 2020). Moreover, the concept of social capital is another important factor and it is explained as trust between individuals and farmer groups, the existence of networks that facilitate cooperation, and the upholding of positive norms developed. Various efforts have been conducted by the government of Kutai Kartanegara Regency to improve the competence of maize farmers, including through the maize revival program. The goal of the maize revival program is to improve farmers' welfare. Welfare has many dimensions, including material living standards (income, consumption, and wealth), health, education, individual activities including work, political voice and governance, social relationships and kinship, the environment, and insecurity (Stiglitz *et al.*, 2011).

Welfare will be better achieved if individuals can optimize their competence and potential. The potential will run maximized if farmers have the awareness to improve welfare, both as individuals and farmer groups. The awareness to "*Betulungan Etam Bisa*" which generally means mutual Cooperative which is an ancestral heritage should be maintained, which has recently begun to diminish. Research has been widely conducted on social capital in several aspects of life. Furthermore, social capital and competence have been examined in different regions but limited attention is placed on Kutai Kartanegara Regency, East Kalimantan Province. For example, Grootaert (Yunus & Fadli, 2020) focused more on other areas. Social capital has also been examined in an economic context without a clear consensus on the effective measurement of the concept among farmers. (Markowska-Przybyła & Ramsey, 2018) and (Muringani & Fitjar, 2021) reported the influence of social capital on economic growth but did not comprehensively explain the measurement and application in the context of farmer welfare. This trend is a representation that the interaction between social capital and competence in increasing farmer welfare has not been deeply examined by existing research. However, (Isralowitz *et al*., 2022) reported the relationship between economic conditions and welfare but did not offer an adequate explanation as to how existing social networks could strengthen the competence of farmers. The second observation is that local wisdom, particularly, the idea of *betulungan etam bisa*, the value of cooperation, has not been discussed in terms of social capital and welfare of the farmers. It is important because local wisdom can be a good base for building social capital to increase farmer competence and welfare. The statement is based on the argument that the availability of social capital can help in the access to local resources. However, in Kutai Kartanegara Regency, East Kalimantan Province, the human capital aspect has not been made a priority, as observed by researchers. Therefore, it is important to conduct further research on the influence of social capital and competence on the farmers' welfare. Social capital that is strengthened by the existence of local wisdom (*betulungan etam bisa*) needs to be explored in depth. This needs to be done because social capital can increase the competence of farmers to improve their welfare. This study was conducted to analyze the effect of competence, the effect of social capital, and the effect of competence on farmers' welfare with social capital as a moderating variable.

1. Literature review

The Relationship Competence and Welfare

Competency is a person's fundamental characteristic, which determines the best and most effective work results following the specified criteria in a particular job or situation Spencer and Spencer (Ruky, 2006). Competence determines a person's behavior and work results in diverse situations and roles. The level of a person's competence can therefore be used to predict whether or not a person will be able to complete their work properly. Competency also determines how a person behaves or thinks, adjusts to various situations, and persists in the long term. Moreover, it is said that the components that makeup competencies are (a) motives, (b) traits, (c) self-concept, (d) knowledge, and (e) skills. Competency is a collection of interconnected personal characteristics, knowledge, and skills that affect the largest part of a job that has a relationship with performance (Ruky, 2006). In different parts of the business world and organizations, competence is very important. It is a determining factor of success from individual development to organizational performance. Research in several fields focuses mainly on the relationship between competence and various aspects of the business world and organizations (Berg *et al*., 2020). The trend shows the importance of human resource competence in facing the increasingly rapid digital transformation. For example, (Alsabahi *et al*., 2021) described how personal characteristics and workplace learning could affect the information technology competence of external auditors. (Batmomolin *et al*., 2022) also focused on the relationship of intrapreneurship competence to training and development as well as employee innovative behavior. Moreover, (Barrientos-Báez *et al*., 2022) reported that students with high entrepreneurial competence had more potential to start a business after graduation. Another research by (Kisubi *et al*., 2022) stated that entrepreneurial competencies had a significant effect on the performance of small and medium enterprises (SMEs) in Uganda using company capabilities as a mediator. (Padi *et al*., 2022) observed that the perceived innovative ability of employees and the attention to innovation by the company increased the possibility of engaging in entrepreneurial activities. The trend showed the need for companies to provide a supportive environment to ensure employees feel confident in using their competencies. Furthermore, (Sebestova *et al*., 2022) compared competence models between business students and business owners in the Czech Republic and Romania. The research showed some core competencies were recognized as important in the two countries despite cultural and economic differences. (Škrinjarić, 2022) also stated the importance of a competence-based method in both organizational and individual contexts.

As discussed in the previous research, a significant relationship was established between competence and well-being. For instance, (Azhar, 2019) noted that teacher competence, for instance knowledge, skills and professional attitudes, directly influenced the psychological well-being of both teachers and those who were taught. (Fauzie *et al*., 2020) also stated that good village development program management competence of village assistants could enhance the effectiveness of fund allocation. The research also showed that village assistant competence had a great influence on community welfare. Another research by (Musthofa, 2019) reported that professional and transparent zakat management was highly dependent on the competence of human resources (HR), with a subsequent greater impact on recipient welfare. It was further observed that HR competence had a positive and significant effect on welfare.

Competence is often associated with performance which subsequently influence welfare. Previous research by (Zainol *et al*., 2018), (Purnamasari *et al*., 2019), (Bektiarso, 2022), (Maulatuzulfa & Rokhmania, 2022), and (Kisubi *et al*., 2022) reported that competence had a significant effect on performance. This trend showed the possibility of improving performance through competence. Increased performance could also influence the achievement of increased welfare. Meanwhile, (Esubalewa & Raghuramaba, 2020) reported that the relationship between competence and performance was not significant. Another research by (Jaya *et al*., 2020) found a correlation between the quality of HR and product performance which was able to increase business competitiveness and later boost business actor welfare. The competence of corn farmers was determined based on skills obtainable from training, which further improved welfare through increased income. The trend was in line with the submission of (Wordofa & Sassi, 2017) that training had a positive and significant effect on income.

The Relationship Social Capital and Welfare

Social capital has been discussed by several experts, including Pierre Bourdieu, who emphasized the importance of resources related to group membership and social networks. James Coleman also argued that social capital was a productive element to achieve certain goals by focusing on the importance of social interaction. Moreover, Robert Putnam related the concept to social relations and the components included, trust, social norms, and social networks. Fukuyama also contended that social capital had a major influence on macro-level economic and political space. This was evident in the fact that the lack of social capital in a group led group or individuals to seek outside support to overcome the challenges they faced. Nan Lin also discussed the role played by individual and group perspectives in the use

of social capital (Usman, 2018). Social capital has been considered to have a significant role in improving community welfare (quality of education, quality of health, and increasing income) and relates to various aspects of life. Welfare is a condition of satisfying material and immaterial needs.

Welfare conditions arise when human life is safe and happy because basic needs for nutrition, health, education, shelter, and income can be achieved (Suharto, 2006).

The social capital discussed is related to utilizing resources to gain economic benefits. Social capital is mutually reinforcing to the welfare of farmers. Increased farmer performance will affect the improvement of farmer welfare. The influence of social capital on performance was found to be positive and significant in previous research (Asmara *et al*., 2018). This was observed from the ability of social capital to act as a driving factor in improving the performance of lobster fishermen. Moreover, (Warmana & Widnyana, 2018) reported that businesses with strong social capital, through community networks and collaboration with other business actors, increase competitiveness and product innovation. This confirmed that social capital had a positive and significant effect on business performance. (Analia *et al*., 2019) also showed how social networks assist SMEs accessing better market information and resources. Another research by (Lyu *et al*., 2022) discussed the effect of social capital on the innovation performance of digital companies. It was observed that social capital of digital companies significantly and positively affected innovation performance during the pandemic.

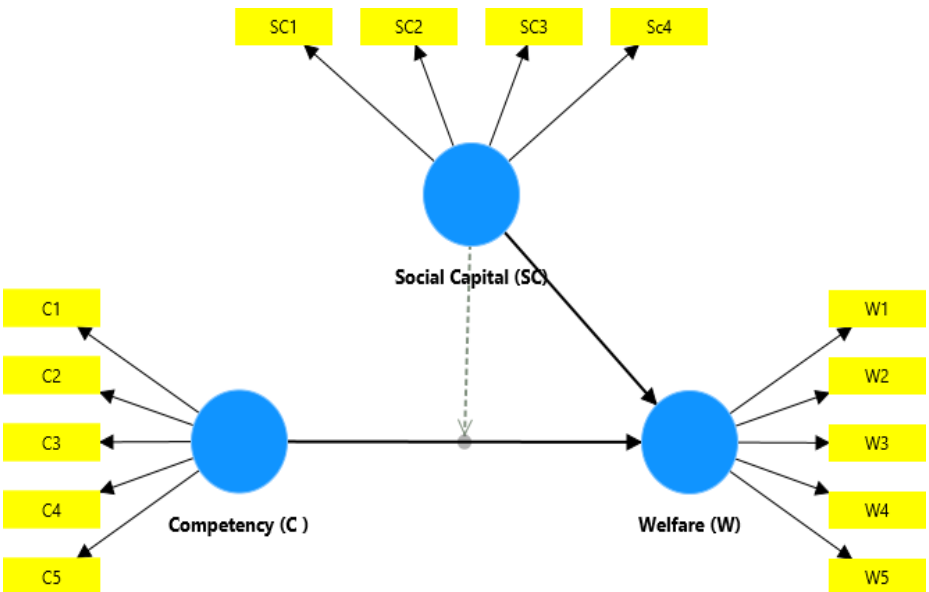
The success of development is indicated by the improvement in welfare of the community. Social capital therefore has a very important role in agricultural development. Thus, social capital plays a role in farmer groups in improving welfare (Cahyono & Adhiatma, 2012), (Harahap & Agusta, 2018), (Lestari & Yuliarmi, 2021), (Setiyawan, 2019), (Yunus & Fadli, 2020), (Antou *et al*., 2022), and (Azis *et al*., 2022). Social capital has a positive and significant effect on welfare (Yuliarmi *et al*., 2020), (Mubarak *et al*., 2020), and (Sidiq *et al*., 2021). The increase in income is an indicator of a welfare measure. The results of the research show that social capital has a significant effect on improving welfare in terms of increasing income (Lulun *et al*., 2019), (Puspita *et al*., 2020), and (Bakri *et al*., 2021). Social capital affects decision-making to take up entrepreneurship (Utomo *et al*., 2022). Social capital is also said to be a reinforcing factor as found in the research on the importance of social capital in promoting financial Inclusion: an international perspective (Cuéllar, 2024). On the contrary, there are research results that show social capital has no significant effect on welfare such as the research results (Gandhiadi *et al*., 2018) and (Kayadoe *et al*., 2019). The existence of social capital can reduce poverty as a result of research (Kharisma *et al*., 2020).

Social capital is a resource possessed by farmers as individuals and groups that can be utilized to improve their competencies. The trust that arises between farmers and farmer groups, the construction of social networks, acting based on cooperation (*Betulungan Etam Bisa*), and always working based on community norms will form individual capabilities that can support the competency of farmers to improve their welfare. Farmers' social capital if used properly, will be a reinforcing variable that improves their competencies to increase their welfare. Vice versa, if the social capital of farmers is not used optimally or not utilized at all, it will not affect welfare, and social capital can be said not to be a variable reinforcing competence in influencing the welfare of farmers. Farmers' social capital is formed from social values that have developed over generations. Social capital is the form of mutual trust, reciprocal relationships between individuals, networks, norms, and values. local wisdom values such as *Betulungan Etam Bisa*. Farmers act on *betulungan etam bisa*, an expression that is identified as the basis of the farming community in doing agricultural activities. This attitude of cooperation is a value of togetherness, mutual assistance and strong collaboration among farmers in social and economic contexts. The system of mutual cooperation in the world of agriculture ensures individual is working to achieve a common goal and this is an important concept in overcoming the problems of farmers. From the economic point of view, it is related to the reduction of production costs. But there is not always mutual cooperation between farmers, because opinions and interests differ. *Betulungan etam bisa* is a key element that can support the success of farmers in conducting agricultural businesses. It helps to solve problems, improve production efficiency and strengthen social relationships in the community through collaboration. In addition, the values are understood and applied by farmers to enhance agricultural output and a better future for themselves and future generations. It points out the significance of continuous support and promotion of cooperation among farmers and in all other aspects of life in the present world which is becoming increasingly complex.

It is argued that social capital has a very important relationship and role to competence, meaning that social capital can be a reinforcing variable or vice versa. Some research findings showed that social capital has had a positive and significant effect on competency as reported by (Yaméogo *et al*., 2018), (Haris, 2019), (Al- Omousha *et al*., 2020), (Ghahtarani *et al*., 2020), (Ginting *et al*., 2020), (Mubarak *et al*., 2020), and (Budiarti, 2021). Social capital as a moderating variable has a positive and reinforcing effect on improving welfare as a research result (Yuliarmi *et al*., 2020). The social capital variable is not a moderating variable that strengthens the influence of the independent variable on the dependent variable (Ravitasari & Larassaty, 2024). Based on the reviewed literature and empirical studies that have been described, the proposed hypothesis is:

H1: Competence has a significant effect on farmer welfare.
H2: Social capital has a significant effect on farmer welfare.
H3: Competence has a significant effect on the welfare of farmers with social capital as a moderating variable.

Figure 1 - Research conceptual framework



Source: Data Analysis (2025).

Based on the literature review on the relationship between social capital and welfare, the relationship between social capital and competency, and the relationship between competency and welfare, a research conceptual framework can be drawn in Figure 1.

This research consists of variables: 1) competency (C) with indicators of skill (C1), knowledge (C2), motive (C3), traits (C4), and self-concept (C5); 2) social capital (SC) with indicators of trust (SC1), network (SC2), norms (SC3), and social responsibility (SC4), and 3) variable welfare (W) with indicators of health status (W1), education status (W2), asset ownership (W3), family income (W4), and social life (W5).

2. Research Methods

Research Designed

This study employed a quantitative research design with an inferential statistical approach. Inferential statistics are statistical techniques designed to analyze sample data and the results are applied to the population (Sugiyono, 2012). The inferential statistical technique is the drawing of conclusions from several samples of the population and the conclusions are expressed in a hypothesis (Ahmad, 2015). The research sample was maize farmers in Kutai Kartanegara Regency, Indonesia. Sampling for maize farmers was conducted using a multi-stage sampling design with two stages. The first stage was to determine the research areas using purposive sampling. Purposive sampling was used in the first stage to determine the research area. This method was applied through the clear rationale of selecting districts with the largest land area and the highest level of corn production compared to others in Kutai Kartanegara. The process led to the selection of six districts, including Samboja, Tenggarong, Sebulu, Tenggarong Seberang, Muara Badak, and Marang Kayu. Each was observed to have unique characteristics supporting the growth of corn such as soil type, climate, and weather patterns. For example, Samboja District is known for its fertile soil and good irrigation system which leads to the tendency of having higher corn production than other areas. Tenggarong District also has good access to the market which ensures easiness for farmers to sell their crops. The consideration of these factors ensures the samples used are truly representative and relevant. Moreover, the use of purposive sampling ensured the focus was on districts with the best potential to produce accurate and useful data for the development of the corn farming sector in the research area. After determining the area, the second stage was to determine the number of samples using the probability method, specifically proportional stratified sampling. This method led to the division of the population into relevant strata and each stratum was represented proportionally in the sample. The purpose was to increase the accuracy of the research results as well as provide a clearer picture of the conditions and challenges faced by corn farmers in each district (Sekaran, 2006).

Data Collection

The types of data employed were primary data and secondary data. Primary data is sourced from direct research collected through questionnaire tools and interview results in selected sub-districts using questionnaires that have been tested for validity and reliability. A validity test was conducted

using Convergent Validity and Average Variance Extracted (AVE) criteria. A discriminant validity test was further applied using the Heterotrait-Monotrait Ratio (HTMT) value. Meanwhile, the reliability test used Cronbach's Alpha and Composite Reliability criteria (Yamin, 2023). Secondary data was obtained from data available at related institutions or agencies through other documentation, and articles. The total population was 1758 people. The number of samples was determined using the Slovin formula (Sedarmayanti & Hidayat, 2002) as follows.

$$n = \frac{N}{1+Ne^2} \quad \ldots\ldots\ldots\ldots\ldots\ldots (1),$$

Notes:
n = number of samples
N = population
e = sampling error rate

Based on equation (1), a sample size of 240 people was obtained. Furthermore, to determine respondents in each sub-district, proportional random sampling was conducted. Proportional random sampling was used to ensure each member of farmer group in the selected districts had an equal opportunity to be selected as part of the sample. The first step was to identify the population and the second was to divide the population into subgroups or strata which were farmer groups in this case. The next step was to take random samples from each farmer group using the lottery method without replacement which ensured each member of the population had the same opportunity to be sampled only once.

Questionnaires

Primary data was collected using questionnaires. The questionnaire consisted of a description of the characteristics of respondents (see Table 1) and questions in the form of indicators of each variable. The questionnaire distributed to 240 selected respondents was in the form of structured interviews with a focus on different research variables. Competence (C) is based on Spencer & Spencer's theory which defines the variable as an underlying characteristic of an individual causally related to criterion-referenced effective or superior performance in a job or situation (Ruky, 2006). This definition is very relevant, specifically when the superior performance expected to be possessed by farmers to increase productivity and achieve prosperity are considered. The explanation includes important aspects that can be applied in different contexts and this shows there is no

need for updates. Competence is a relevant fundamental characteristic that is capable of influencing performance irrespective of the specific context faced by farmers in Indonesia. This shows the basic principles of understanding competence are applicable even though there is a need to adapt some elements.

Another variable was social capital (SC) which was based on the opinions of Putnam and Fukuyama (Usman, 2018). According to Putman, social capital is integrated into social relations and developed through social networks with the components identified to include trust, social norms, and networks. The concept is also defined by Fukuyama as a series of informal values or norms shared among members of a group to enable cooperation. This led to the evaluation of informal norms in the form of *betulungan etam bisa* implemented as social responsibility. The definition of Fukuyama adds a new dimension to the understanding of social capital by showing the concept extends beyond relationships between individuals to values that bind cooperation. In Indonesian context, a relevant example is the concept of *betulungan etam bisa* which shows how informal norms can be implemented as social responsibility.

The adjustments to the original definition of social capital are not necessary in the Indonesian context. This is because the values and norms existing in Indonesian community have proven effective in building cooperation and solidarity. The trend shows that social capital is an important element in building cooperation and solidarity.

Both Putnam and Fukuyama make significant contributions to understanding this concept through the emphasis on trust, social norms, and networks. This is associated with the fact that values such as cooperation reflect existing informal norms and show how Indonesian community can unite in facing challenges. The application of social capital in the local context remains relevant and does not require significant adjustments despite the existence of several different definitions.

Welfare (W) is another variable in this research developed based on the opinion of Stiglitz. Community welfare was formed based on several dimensions, including material living standards in the form of income, consumption, and wealth. The others are health, education, individual activities such as work, political and government voice in addition to social relationships and kinship, environment, and insecurity (Stiglitz *et al.*, 2011). The variable is a complex and multidimensional concept that covers several aspects of community life. In Indonesian context, a deep understanding of the dimensions proposed by Stiglitz is essential to formulate effective policies. This is possible because the consideration of factors such as health, education, employment, political participation, social

relationships, environment, and insecurity can allow the development of a more comprehensive strategy to improve individual welfare. Therefore, the original definition is considered relevant and there is no need for significant adjustments or adaptations.

The variables are measured through the measurement of the indicators of each variable with the size of an ordinal scale using a score developed by Rensis Likert (Sugiyono, 2012). Each questionnaire item containing statements or questions about the indicators of each variable is given a lowest score of one (1) and a highest score of five (5) (see Table 2).

Table 1 - Description of Respondent Characteristics

No	Respondent characteristics	Score and Criteria					
		1	**2**	**3**	**4**	**5**	**Total**
1.	**Age (Years)**	< 25	25-34	35-44	45-54	> 55	
	Frequency (f)	1	19	59	76	85	240
	Percent (%)	0.42	7.92	24.58	31.67	35.42	100
2.	**Education**	Not finished elementary school	Elementary school	Junior High School Equivalent	High School Equivalent	Bachelor, Master, Doctor	
	Frequency (f)	15	111	56	53	5	240
	Percent (%)	6.25	46.25	23.33	22.08	2.08	100
3.	**Number of family dependents (people)**	≤ 1	1-2	3-4	5-6	≥ 7	
	Frequency (f)	10	64	124	35	7	240
	Percent (%)	4.17	26.67	51.67	14.58	2.92	100
4.	**Length of farming (years)**	≤ 1	2-4	5-7	8-10	≥ 11	
	Frequency (f)	41	131	28	13	27	240
	Percent (%)	17.08	54.58	11.67	5.42	11.25	100

Source: Data Analysis (2025).

Table 2 - Variable Description

Code	Variable and indicators		Scores					
			1	**2**	**3**	**4**	**5**	**Total**
Competency								
C1	Skill	Frequency (f)	1	27	154	45	13	240
		Percent (%)	0.42	11.25	64.17	18.75	5.42	100
C2	Knowledge	Frequency (f)	3	22	157	45	13	240
		Percent (%)	1.25	9.17	65.42	18.75	5.42	100
C3	Motive	Frequency (f)	2	44	117	56	21	240
		Percent (%)	0.83	18.33	48.75	23.33	8.75	100
C4	Traits	Frequency (f)	7	14	77	91	51	240
		Percent (%)	2.92	5.83	32.08	37.92	21.25	100
C5	Self concept	Frequency (f)	0	24	83	118	15	240
		Percent (%)	0	10.0	34.58	49.17	6,.5	100
Social Capital (SC)								
SC1	Trust	Frequency (f)	1	65	94	53	27	240
		Percent (%)	0.42	27.08	39.17	22.08	11.25	100
SC2	Network	Frequency (f)	2	57	120	29	32	240
		Percent (%)	0.83	23.75	50.0	12.08	13.33	100
SC3	Norms	Frequency (f)	5	67	93	48	27	240
		Percent (%)	2.08	27.92	38.75	20.0	11.25	100
SC4	Social responsibility (*Betulunga n etam bisa*)	Frequency (f)	4	59	92	68	17	240
		Percent (%)	1.67	24.58	38.33	28.33	7.08	100
Farmer Welfare (W)								
W1	Degree of health	Frequency (f)	18	29	25	105	63	240
		Percent (%)	7.5	12.08	10.42	43.75	26.25	100
W2	Education degree	Frequency (f)	10	36	28	123	43	240
		Percent (%)	4.17	15.0	11.67	51.25	17.92	100
W3	Asset ownership	Frequency (f)	10	34	42	117	37	240
		Percent (%)	4.17	14.17	17.5	48.75	15.42	100
W4	Household income	Frequency (f)	9	41	14	129	47	240
		Percent (%)	3.75	17.08	5.83	53.75	19.58	100
W5	Social life improves	Frequency (f)	24	27	19	96	74	240
		Percent (%)	10.0	11.25	7.92	40.0	30.83	100

Source: Data Analysis (2025).

Analysis Approach

Data analysis was done by SmartPLS version 4.0. This research, in the social and economic fields, has been widely used by the SmartPLS statistical approach. Researchers chose SmartPLS, because SmartPLS has advantages, for example, compared to regression analysis, SmartPLS can estimate the model simultaneously (Sholihin & Ratmono, 2013). The use of SmartPLS follows several requirements, namely; (1) The loading factor (LF) value is above 0.7 (LF> 0.7), (2) composite reliability ≥ 0.70, (3) rho A ≥ 0.70, Cronbach's alpha ≥ 0.70, AVE ≥ 0.50, cross-loadings, Fornel-Lacker criterion, HTMT < 0.90 (Hair *et al.*, 2022). In turn, (a) if the weight of the measurement item was not significant but had an LF ≥ 0.50, it was still included in the model, (b) if the weight of the measurement item was not significant and the LF < 0.50 but the LF was significant, then the indicator was removed from the model, and (c) if the weight of the measurement item was not significant and the LF < 0.50 and the LF was not significant, the indicator was removed from the model (Yamin, 2023).

3. Results

3.1. *Evaluation of measurement model*

The measures used to assess all the variables were evaluated and the variations identified in the items applied to construct validity and reliability tests were explained. The focus was on loading factor (LF), composite reliability through Cronbach's Alpha and Rho A values, AVE, Fornell Lacker Criterion, and HTMT.

Loading Faktor (LF)

The Loading Factor (LF) or outer loading is the correlation between each measurement item and the variable. LF was used to assess the level of good or bad associated with an item adopted to measure a variable. The assessment criteria or rule of thumb according to Hair *et al.* (2022) is LF ≥ 0.70. (Yamin, 2023) further stated that LF value ≥ 0.50 could be included in the model and the criterion was used in this research. The results obtained from the application of SmartPLS version 4.0 are presented in Table 1.

Table 3 - Loading Factor (LF)

Indicator	Competency (C)	Social Capital (SC)	Welfare (W)	SCxC
C1	0,627			
C2	0,690			
C3	0,790			
C4	0,745			
C.5	0,622			
SC1		0,682		
SC2		0,774		
SC3		0,847		
SC4		0,857		
W1			0,955	
W2			0,936	
W3			0,921	
W4			0,951	
W5			0,945	
SCxC				1,000

Source: Data Analysis (2025).

Composite reliability and Average variance extracted (AVE)

The measures that describe the level of reliability or internal consistency of reliability are Cronbach's Alpha and Rho A. The Cronbach's alpha value will provide a lower/too conservative reliability value while the Composite Reliability value is considered too high. Therefore, the Rho A reliability level can be used as an alternative, whose value lies between Cronbach's Alpha and Composite Reliability (Hair *et al.*, 2022).

AVE is a measure that describes the average variation of each measurement item in a variable. It also shows how well the variable can explain the variation of the measurement items. Moreover, AVE reflects the convergent validity of the variable and the criterion used in this research is values > 0.5 (Yamin, 2023). The statistical results with SmartPLS showed that the statistical measures of variable reliability and convergent validity were acceptable, as shown in Table 4.

Table 4 - Construct Reliability and Validity

Variable	Cronbach' s Alpha	rho_ A	Composite Reliability	Average Variance Extracted (AVE)
Competency (C)	0,752	0,798	0,825	0,487
Social Capital (SC)	0,824	0,878	0,871	0,629
Welfare (W)	0,968	0,969	0,975	0,886

Source: Data Analysis (2025).

Discriminant Validity

The discriminant validity evaluation was conducted using the Fornell-Lacker Criterion approach. The results of the study are shown in Table 5. Based on the Fornell Lacker Criterion, the root AVE of competency was (0.698) higher than its correlation with social capital (0.097) and welfare (0.629). Similar to the root AVE of social capital was higher than the correlation of the welfare variable. Thus the evaluation of discriminant validity based on Fornell and Lacker criteria was accepted. Based on the HTMT assessment presented in Table 6, the HTMT value of the variable pair is less than 0.90. This indicated that the variables had good discriminant validity.

Table 5 - Discriminant Validity (Fornell-Lacker)

Variable	Competency (C)	Social Capital (SC)	Welfare (W)
Competency (C)	0,698		
Social Capital (SC)	0,097	0,793	
Welfare (W)	0,629	0,164	0,942

Source: Data Analysis (2025).

Table 6 - Heterotrait-Monotrait Ratio (HTMT)

Variable	Competency (C)	Social Capital SC	Welfare (W)	Moderating Variable (SCxC)
Competency (C)				
Social Capital (SC)	0,157			
Welfare (W)	0,654	0,154		
Moderating Variable (SCxC)	0,279	0,057	0,269	

Source: Data Analysis (2025).

3.2. *Hypothesis Test*

The hypothesis testing of this study was done by bootstrapping with a sub-sample = 5000. PLS SEM did not assume that the data was normally distributed, therefore the hypothesis testing procedure used a non-parametric procedural approach, namely bootstrapping. This procedure is an alternative to hypothesis testing from exact methods when the sampling distribution of the data is unknown, done by taking samples and returning samples (resampling) as many as p times (generally 5000), which is useful for creating standard errors and parameter estimates. The t-test results seen from the t-values for the two-tailed test were 1.96 (significant level = 5%). The test conducted in this research was at a 95% confidence level (α = 5%). The preference for the level is based on the consideration that social research generally uses α = 5%. SmartPLS generated a p-value for each evaluation and compared it with the pre-determined alpha (0.05). If the p-value <0.05 then there is an influence between significant variables. The Bootstrap method was selected using Bias Corrected and Accelarated (BCA) (Yamin, 2023). The next step was looking at the path coefficient and T value to test the proposed hypothesis. According to Hartono, the hypothesis can be supported by comparing T-table and T-statistic values. This is based on the rule that the hypothesis is supported when T-statistic is greater than T-table value (Abdillah & Jogiyanto, 2015). The results of calculations by SmartPLS are presented in Table 7.

Table 7 - Path Coefficient and T-Statistics (Mean, STDEV, T-Values, P-Values)

Variable	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Decesion
Competency (C) -> Welfare (W)	0.588	0.591	0.040	14.866	0.000	Significant
Social Capital (SC) -> Welfare (W)	0.109	0.119	0.053	2.070	0.038	Significant
Moderating variable (SCxC) -> Welfare (W)	-0.125	-0.127	0.055	2.261	0.024	Significant

Source: Data Analysis (2024).

The findings of this study indicated that competency and social capital had a significant effect on farmers' welfare. Social capital was a moderator variable that significantly affects welfare but had a negative relationship. This meant that social capital was not a variable that strengthened the influence of competency on welfare

4. Discussion

The Effect of Competency on Welfare

Competency is a characteristic that underlies a person's ability to achieve high performance in their work. These characteristics appear as skills, knowledge, motives, traits, and self-concept to achieve the set goals, namely increased welfare. The result of this study was that competency had a positive and significant effect on welfare. This was indicated by a T statistic of 15.165 which was greater than the T table of 1.96 and a significance value at the confidence level or $\alpha = 0.05$ of 0.000 (presented in Table 7). The results provided strong evidence that competence development could be an effective strategy to improve individual welfare, specifically in the context of corn farmers. The observation was in line with previous research conducted by (Azhar, 2019) and (Fauzie *et al*., 2020) who also reported a significant

positive relationship between competence and welfare. The evidence provided showed that individuals with better competence tended to have a higher quality of life. Moreover, (Musthofa, 2019) confirmed that HR competence positively affected welfare. The research reported that appropriate and skilled HR could accelerate performance with subsequent improvement in welfare (Zainol *et al*., 2018), (Purnamasari *et al*., 2019), (Bektiarso, 2022), and (Kisubi *et al*., 2022) also found a positive and significant relationship between competence and performance. In this context, entrepreneurial competence was the key to improving business performance and later increased income and welfare. The results are similar to the present research but there are differences in context and focus. The variation is based on the fact that the focus is on the impact of competence on individual welfare in the context of corn farming. The context provides a more specific and relevant perspective for farmers facing unique challenges in the agricultural sector. The understanding of this context shows how competence can be optimized to improve agricultural yields and general farmer welfare. The ability to manage a good farm in the sense that farmers have high competency, and thus welfare will be easier to achieve. The findings of this study were confirmed by the results of respondents' answers about competency (skills, knowledge, motive, traits, and self-concept) respondents tended to answer positively (see Table 2). Maize farmers' skills were obtained from technical guidance and counseling by agricultural extension workers. Knowledge is in the form of profit-oriented farmer experience and farming knowledge that has been owned. Farmers always have the motivation to increase farm productivity. Traits of farmers developed consistently in farming. Self-concept is a set of attitudes farmers possess to strive to increase farm productivity. The competency of maize farmers, as described, contributes to welfare. Thus, the analysis of each competency element in supporting the findings of this study was more detailed compared to other studies that usually only looked at competencies in general.

The Effect of Social Capital on Welfare

Researchers used social capital indicators of trust, network, norm, and social responsibility. The results showed that social capital had a positive and significantly influenced the welfare of farmers. This was indicated by the value of T statistic (2.039) greater than T Table (1.96) at a significance level of 0.041 ($< \alpha = 5\%$) (Table 7). Social capital owned by corn farmers in Kutai Kartanegara is quite good because the answers provided tend to be positive as presented in Table 2. Corn farmers relatively trust the leaders of farmer groups and this further increases productivity to achieve welfare. There is also a sense of togetherness manifested in *betulungan etam bisa* which

is relatively good to further advance farming businesses. The concept of *betulungan etam bisa* reflects a strong collaborative spirit among farmers in land management, planting, and harvesting. This was in line with the opinion of (Yuliarmi *et al*., 2020) ho emphasized the importance of members' trust in leaders to increase social capital. The research also emphatically stated that social capital had a positive and significant effect on community welfare. This was observed from the fact that farmers had more propensity to contribute actively to activities designed for increasing agricultural yields when there was high trust in the leaders of the groups. (Sidiq *et al*., 2021) supported the trend by emphasizing that social capital, consisting of participation, reciprocity, trust, social norms, values, and proactive activities contributed positively to community welfare. Meanwhile, (Gandhiadi *et al*., 2018) and (Kayadoe *et al*., 2019) had different results by showing that social capital did not have a significant effect on welfare. This difference can be interpreted through the variation in social and cultural contexts in each area. The trend is observed from the fact that areas with a strong tradition of cooperation tend to show a positive impact of social capital on welfare, while others without the same social structure present different results.

Trust developed between members and leaders of farmer groups is essential in increasing social capital. This extends beyond interpersonal relationships to the development of a collaborative climate that allows farmers to share information, resources, and experiences. The aspect of increasing social networks to motivate an enhancement in farmer income cannot be ignored. These social networks are often developed through joint activities, such as regular meetings, training, or even social events for all community members. An actively networked community can facilitate access to better market information, more efficient agricultural technology, and wider marketing opportunities. Moreover, social norms often used as the basis for farming are important in shaping the behavior and attitudes of community members. The norms are mostly passed down for generations to influence how farmers interact with each other and conduct agricultural activities. Social responsibility realized from community togetherness and reflected in the culture of *betulungan etam bisa* can ensure an increase in farmer welfare. This culture covers the physical aspect of working together and also reflects the moral and ethical values associated with social interaction. In several cases, when one member of the community experiences difficulties, others often attempt to help without expecting returns. This provides a climate of mutual trust and strengthens the sense of belonging to the community. For example, in a situation where a farmer experiences a crop failure, other community members often help by donating part of their harvest or offering labor to assist in the replanting process. The culture of *betulungan etam bisa* (cooperation) is an ancestral heritage that exists in the present time. It is a

cultural identity that also functions as an important social capital to increase farmer productivity and achieve prosperity. In a modern context, the culture can be integrated into more innovative agricultural practices. An example is for farmer groups to hold joint training related to learning new sustainable agricultural methods. This ensures cultural heritage is preserved and updated to meet the challenges of the times. The trend showed that social capital owned by farmers, both individually and in groups, had a positive influence on efforts to improve prosperity.

This research analyzed the effect of social capital on farmer welfare based on the assumption that other variables such as access to credit, weather conditions, and agricultural policies were control variables and had a constant effect (ceteris paribus). Access to credit is very important because it allows farmers to make the necessary investments to increase productivity. Lack of adequate access can force farmers to use traditional, less efficient farming methods, which are capable of hindering the growth of agricultural output. Weather conditions are also important to farmer welfare because extreme climate change, such as increasing temperatures and rainfall patterns, has a direct impact on agricultural output. Social capital is capable of functioning as an adaptation mechanism in these situations. For example, members of farmer groups are able to share information on how to deal with unpredictable weather conditions, such as more efficient irrigation methods or crop varieties considered to be better resistant to drought. Agricultural policies implemented by the government also have a significant effect on farmer welfare. This is because policies that support access to credit, training, and extension for farmers can strengthen social capital and improve welfare.

Social capital owned by farmers, both individually and in groups, had a positive effect on efforts to improve welfare, as respondents' answers to each element of social capital had a positive value (Table 2). Social capital has a significant effect on farmer welfare but the effect cannot be separated from control variables such as access to credit, weather conditions, and agricultural policies. This is because social capital functions as a bridge connecting farmers with the resources and information needed to increase productivity and resilience. Therefore, efforts to improve farmer welfare need to include strengthening social capital as well as ensuring access to credit and agricultural policies are provided to support the development of mutually beneficial social networks. This holistic method is expected to ensure a significant increase in farmer welfare in the future. The trend shows that social capital, consisting of trust, networks, norms, and social responsibility built among farmers, is a key element in increasing productivity and welfare. This research adds empirical evidence to support the theory of social capital and also provides new insights into how social and cultural

contexts can affect agricultural outcomes. The contribution is important to the development of more inclusive and sustainable agricultural policies in Indonesia.

The Effect of Competency on Welfare with Social Capital as a Moderating Variable

The effect of competence on farmer welfare through the application of social capital as a moderating variable was significant with a negative coefficient, as presented in Table 7. This result showed that social capital was unable to moderate the effect of competence on farmer welfare. The observation was in line with the report of (Ravitasari & Larassaty, 2024) that social capital could not moderate the effect of individual characteristics on performance. An important inference is that performance has an impact on productivity and cause an increase in welfare. Meanwhile, this research differed from the position of (Yuliarmi *et al.*, 2020) that social capital strengthened the positive effect of cooperative empowerment on public welfare in Denpasar City.

The development strategy of Kutai Kartanegara Regency, namely the prosperous people development movement through its maize revolution program, was aimed at improving the competency of maize farmers. Farmer competencies were measured; (a) based on skills, (b) knowledge, (c) a farmer's behavior that constantly improved competency (motives), (d) a farmer's consistent response to a situation or information to improve competency (traits), and (e) self-concept (attitude or self-image of the farmer that constantly improved competency). All of these elements of the farmer's competency could be built on the existence of social capital. Based on this description, it can be said that the social capital of maize farmers can strengthen the influence of competency on improving farmers' welfare. However, after research and analysis, this was not the case. The finding of this study was that social capital had a negative effect as a variable that moderated the effect of competence on welfare. This meant that social capital was not able to act as a moderating variable that strengthened the effect of competency on welfare. The trend showed that social capital was not maintained and managed properly to strengthen the existing local culture.

The trust aspect is the primary element of social capital, and networks and norms will not work well if trust between farmers, farmer groups, extension workers, and the government is not maintained. Based on observations in the field, the trust aspect of maize farmers was saturated because the maize revolution program was seen as a 'project'. Betulungan etam bisa failed to work well because, for instance, it was influenced by the development of time/technology. The importance of social capital cannot be separated from

the cultural context. This is necessary because the culture of social context where the initiative is implemented has a significant impact on success or failure. Moreover, (Cuéllar, 2024) stated that the cultural characteristics of a country had a great effect on the dynamics of social interaction. This shows that a culture of mutual cooperation and strong social norms in Indonesia, specifically in rural areas, can be used to support the development of social capital. However, the inability of the local culture to strengthen social networks is capable of leading to inadequate functioning of social capital.

Conclusions

This study investigated the effect of competence and social capital on the welfare of farmers and examined social capital as a moderator variable of the effect of competence on welfare. The results showed that the effect of competency on the welfare of farmers was positive and significant. Competencies that consist of aspects of skills, knowledge, motive, traits, and self-concept had a positive and significant effect on the welfare of the farmers. In conclusion, competence was an important factor affecting farmer welfare, specifically in the context of corn farming. The existence of good skills, knowledge, motivation, character, and self-concept could assist farmers to optimize their agricultural output and subsequently increase income and welfare. The results were in line with the report of previous research by (Azhar, 2019) and (Fauzie *et al.*, 2020) that there was a significant positive relationship between competence and welfare. Both research provided evidence that individuals with better competence tended to have a higher quality of life. However, it was important to consider the local context and external factors affecting outcomes despite the similarities in the results. More effective strategies could also be developed to improve farmer welfare in Indonesia and around the world by understanding the elements of competence and the interaction with other factors.

Social capital had a positive and significant effect on welfare. The main element of social capital is trust. The trust would encourage farmers to improve social networks based on local norms and culture (*betulungan etam bisa*). The results of respondents' answers to social capital tended to be dominantly positive. Trust between members and leaders of farmer groups provided a conducive environment for collaboration. In this context, the sense of togetherness manifested in the practice of mutual cooperation, known as *betulungan etam bisa*, showed a strong collaborative spirit among farmers. The activity was identified in different forms of corn farming activities, from land preparation, and planting, to harvesting. This was consistent with the result of (Sidiq *et al.*, 2021) that social capital, consisting of participation,

reciprocity, trust, social norms, values, and proactive activities, contributed positively to public welfare. The observation was an important contribution to the development of more inclusive and sustainable agricultural policies in Indonesia. The knowledge gained could be used by policymakers to design programs to support the strengthening of social capital among farmers. The results added empirical evidence to support the theory of social capital and provided new insights into how social and cultural contexts affected agricultural output.

The impact of potential on welfare with social capital as a moderating variable is negative and significant. The trust of corn farmers who were members of the Corn Revolution program was saturated. The local culture of '*betulungan etam bisa*' had been eroded by the influence of modernization and the development of advanced technology. However, (Yuliarmi *et al*., 2020) provided a different report by showing that social capital strengthened the effect of cooperative empowerment on public welfare in Denpasar City. This difference was probably due to some conditions capable of influencing the results. For example, in the context of Denpasar, there was a stronger social structure and community network which allowed social capital to function effectively in strengthening relationships between individuals and groups. The local factors in Kutai Kartanegara such as culture, tradition, and ways of interacting did not support the development of effective social capital. This showed the importance of effective social capital in improving welfare in addition to farmer competence. The trend was associated with the observation that inadequate maintenance and management of social capital had a negative impact on efforts to improve farmer welfare. Therefore, to achieve better development goals, all parties including the government, non-governmental organizations, and the local community should collaborate in developing an environment to support the development of positive and sustainable social capital. The suggestion was considered important for improving farmer welfare in the future.

This research provided an important contribution to the development of more inclusive and sustainable agricultural policies in Indonesia. The knowledge gained could also be used by policymakers to design programs needed to support the strengthening of social capital among farmers. This was considered important to ensure effective management and optimal functioning of social capital to improve farmer welfare. Moreover, the contribution added to empirical evidence to support the theory of social capital and provided new insights into how social and cultural contexts affected agricultural output.

Some of the limitations identified included the focus only on corn farmers in Kutai Kartanegara Regency which showed the inability of the results to be effective in several other areas in Indonesia. The generalization is difficult because the variations in social and cultural contexts in each area

can produce different results. It is necessary to understand that each farming community is influenced by economic factors as well as the traditions, norms, and values of the community. For example, farmers have better access to education and training in rural areas in Java than in eastern Indonesia. This suggests that the results in an area cannot be fully applied to others without considering the unique local context. The limitations show the need for a more holistic and contextual method to understand the relationship between competence, social capital, and farmer welfare. The inclusion of multiple perspectives and research methods can ensure a deeper and more relevant understanding of how the factors interact across different social and cultural environments. This is necessary to enrich the existing literature and provide practical guidance for policymakers and practitioners in designing more effective interventions to improve farmer welfare across Indonesia.

This research recommends that farmers need to maintain trust well and optimally. Moreover, there is a need to implement the local culture of *betulungan etam bisa* seriously compared to serving as only a slogan. This is necessary because the local culture reflects the spirit of mutual cooperation that has become an integral part of the lives in Kutai Kartanegara. The implementation of the inherent principles can allow farmers to strengthen relationships between individuals and develop positive synergy in farming community. Farmers also need to continue building networks, specifically with corn associations, to improve their competence. These networks serve as a forum to share knowledge, experiences, and resources to increase productivity. For example, regular meetings or discussion forums held by the associations are necessary to exchange information on the latest cultivation methods, how to overcome pests, or even more effective marketing strategies. This shows that the networks strengthen solidarity among farmers and increase their competitiveness in the market. Furthermore, training and development programs conducted by all stakeholders are capable of empowering farmers to understand the importance of social capital and its effective management to increase welfare sustainably.

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