Original research article

Social Capital and Community Participation in the Development of the Aquaculture Center in Soko Village-Indonesia

Erlindah Aprilia[a*], Gunawan Prayitno[a], Fadly Usman[a], Nataliia V. Biloshkurska[b], Enock Siankwilimba[c], Habeenzu Simamba[d]

[a]Department of Regional and Urban Planning, Faculty of Engineering, Universitas Brawijaya, 65145 Malang, **Indonesia**
[b]Department Marketing, Management and Business Management, Pavlo Tychyna Uman State Pedagogical University, Cherkasy Region, 20300, **Ukraine**
[c]Musika Development Initiatives Zambia Limited, 6, Tukuluho Road, Long Acres, Post Net No. 481, Private Bag E891, Lusaka, **Zambia**
[d]Graduate School of Business, University of Zambia, PO Box 32379, Lusaka, **Zambia**

ABSTRACT

Aquaculture fisheries are important in developing the national fisheries sector to improve and sustain the community's welfare. Social capital becomes community support in dealing with various problems in fishery areas. This research aims to identify the relationship between social capital and community participation in implementing the development of Soko Village as an aquaculture center in Glagah District, Lamongan Regency. The population in this study were the heads of families (households) of cultivators, with a sample of 181 families. The analysis used is the structural equation model (SEM). The result shows that the social capital of the Soko Village community consists of trust, networks, and norms. The relationship between social capital and community participation in implementing the aquaculture center development program indicates a significant positive relationship between social capital and community participation.

1. Introduction

The productivity of the fisheries sector contributes to 7 percent of Indonesia's source of GDP growth [1]. Submitted that the aquaculture sub-sector contributes directly and indirectly to employment creation [2]. Thus, the aquaculture sub-sector needs to be developed, thereby helping to improve the livelihood of communities. The participation of all key stakeholders is needed in order to develop the aquaculture sub-sector fully [3]. Directed that extension models promote a win-win situation as communities learn and work together in the agricultural sector, including aquaculture [4]. According to Uphoff [5], social capital tends to increase stakeholders' participation in the development of the aquaculture sub-sector per development area. This, coupled with community participation, is instrumental in determining the overall success of the aquaculture subsector development program.

According to the Lamongan Regency Regional Regulation, Number 3 of 2021, regarding the Regional Spatial Plans and Minapolitan Master Plan, brackish water aquaculture and ponds development is of great potential in Soko Village of Glagah District. The fisheries area

development in the realm of social capital as a paradigm is one of the important aspects of human, social, political, and economic development [6].

Some of the problems affecting aquaculture development in Soko Village are related to the suboptimal distribution of funds by the government to cultivator groups for them to produce seed quality. The lack of optimal involvement of the cultivating communities in aquaculture coupled with training also contributes to the low productivity of fish [7]. Low fish productivity due to poor coordination and cooperation between stakeholders and the community. This is together with a lack of enthusiasm in implementing a successful aquaculture program due to bureaucratic structures at the central level and among program implementers.

In addressing the problems identified above, this research aims to model the relationship between social capital and community participation in implementing the aquaculture central development program. Structural Equation Model (SEM) is used to analyze the factor that builds social capital and community participation, thereby determining how social capital supports community participation in the program. Besides that, it's SEM also used to analyze the

relationship between social capital and community participation.

2. Method

The research is descriptive, based on a quantitative approach. It is consistent with the research's aim of identifying the factors forming social capital in Soko Village and how social capital influences the community's participation in program implementation. The descriptive analysis describes how phenomenon are described in general to examine the condition of an area [8].

2.1. Structural Equation Modeling (SEM) Analysis

The analysis method used in this research is structural equation modeling (SEM). SEM analysis is carried out in three stages, checking the validity and reliability of the model (confirmatory factor analysis) to reduce the indicator variables, testing the influence model between variables (path analysis), and determining the predictive power of the model (structural model analysis). SEM is a second generation of multivariate data analysis technique that can assist researchers in examining the relationship between latent variables. Considering Prayitno's, the advantages of using SEM analysis in this study is that it can be used to examine relationships between variables which are more complex so that an overview of the entire model can be obtained [9].

SEM analysis program used in this research is SEM PLS 4.0, which offers a more robust performance in analyzing variables with the scale type in the model used [10]. The assessment of the social capital variable's validity uses confirmatory factor analysis (CFA) which if indicator is valid, it has a loading factor value ≥0,7.

A simple random sampling technique was used fot sampling in this study. The total population taken was 343 households of fish cultivators/farmers in Soko Village. In this study the sample was based on family members because in one family there was 1 member of the fish farming group. The formula used to calculate the sample size is Krejcie-Morgan's following Eq. 1 [11].

Based on Eq. 1, the sample for the research is 181 households (respondents). To measure social capital and community participation, a questionnaire was used. The questionnaire had a five-point Likert scale (1 = strongly disagree; 2 = disagree; 3 = simply agree; 4 = agree; 5 = strongly agree) [12]. Prior to the actual enumeration, a pilot was conducted where a questionnaire was administered to 10 fish cultivators/farmers for validity test by the value >0,632 and reliability test by the value 0,60. This was together with the analysis of the results using SPSS program, version number of 26.0 [13]. Validity test was carried out as a measuring tool to find out how carefully the instrument in measuring object in this research [14]. Meanwhile the reliability test (Cronbach alfa) related to trust of the truth in research instrument (questionnaire).

$$S = \frac{x^2 . N . P(1-P)}{d^2 . (N-1) + x^2 . P(1-P)}$$

$$S = \frac{3,841 . 343 . 0,5 (1-0,5)}{0,05^2 . (343-1) + 3,841 . 0,5 (1-0,5)} \quad (1)$$

S = 181 Households

where:
S = Samples; x^2 = x^2 value (3,841); N = Population; d = degree error (0,05); P = Proportion of population

2.2. Variable Description

Variables are variations that are the target of research with a classification that grouped them in a level [15]. The variables are divided into latent (construct) and indicator (manifest) variables. Latent variables consist of social capital aspects, including trust, social networks, and norms. Meanwhile, latent variables in this research are community participation measured by the respondent's knowledge about the program, collaboration of the cultivators in program implementation, the activeness of participation, and the ability to make decisions and give some opinions. The following (**Table 1**) is the description of the variable measurement used in this research.

2.3. Hypotesis Model

The hypothesis of this study, there is a relation between social capital of trust, networks, and norms on community participation in the implementation of development programs. To determine the relation between social capital and the community's participation in program, then using SEM analysis would be appropriate. **Figure 1** is the model hypothesis used in this research.

Table 1. Variable measurement

| Variable		Manifest Variable	Sources
Social Capital	Trust	Trust of the community (K1)	[5], [9], [16]–[22]
		Trust of the member in cultivation group (POKDAKAN) (K2)	
		Trust of the government (K3)	
		Trust of the community leader (K4)	
	Network	Social interaction in maintaining good relation (J1)	
		Ability to build association (J2)	
		Cooperation between cultivators (J3)	
	Norm	Religious norm (N1)	
		Cultural norm (N2)	
		Local Constitution (N3)	
		Rules understood by member of the cultivation group (POKDAKAN) (N4)	
Community's Participation		Fish cultivator's knowledge of the aquaculture central development program (Y1)	[12], [19], [20], [22]
		Collaboration and activeness in program implementation (Y2)	
		Participation in the cultivation group (Y3)	
		Ability to make decisions and give opinions (Y4)	
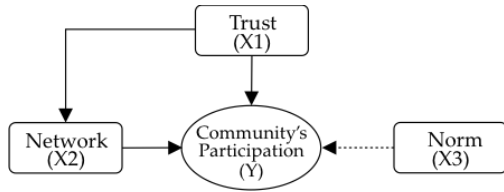
Figure 1. Hypotesis Model

3. Result and Discussion

Results and discussion were based on the study area, coupled with the characteristic of social capital of Soko Village Community in the form of trust, network, and norm. Followed by the characteristics of community participation, and the result of SEM analysis

3.1. Study Area

Lamongan Regency is one of the three regencies that contribution towards the highest aquaculture production value in East Java, Indonesia, with a production value of 1.267,78 billion fishery products was vivid. The location for the brackish water and pond aquaculture development program of Lamongan Regency is located in the Glagah District. Based on (**Figure 2**) as a center of aquaculture, Glagah District has the largest pond area based on Soko Village profile with the total area around 3.856,35 Ha or around 81,28% of the total area.
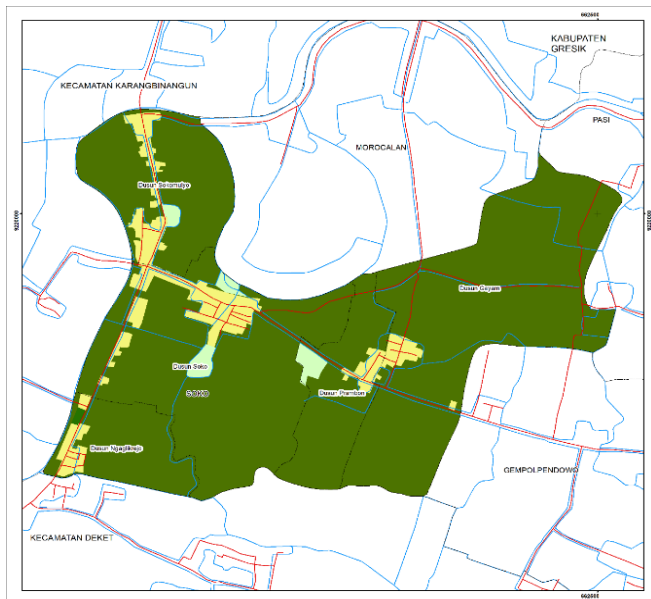

Figure 2. Soko Village Land Use

Based on the Minapolitan Masterplan of Lamongan Regency, the aquaculture center in Glagah District project is located in Soko Village. Soko Village is the center of aquaculture due to its strategic location and good accessibility to distribute aquaculture products. Administratively, Soko Village Consist of five hamlets, two community units, and ten neighborhood units. The fisheries sector is the mainstay economy in Soko Village. Geographical conditions and land use factors influences its rich endowment. The area of the pond field has effects on land productivity, thereby making fishery products the main commodity in Soko Village. The following **Table 2** is the land use of Soko Village.

Table 2. Soko Village Land Use

Land Use	Area (Ha)	Present (%)
Pond Field	166,41	90,14
Farming Land	3,18	1,72
Settlement	14,82	8,03
Others	0,2	0,11
Total	**184,61**	**100**

3.2. Characteristics of Respondent

The respondent (181 fish cultivators/farmers) characteristics were obtained using a questionnaire as primary data. The following (**Table 3**) provides the characteristics (demographics) of respondents.

Table 3. Characteristics (Demographics) of Respondents

Demographics	N
Age	
20-29	7
30-39	27
40-49	69
50-59	40
60-69	34
≥70	4
Main Occupation	
Self-employed	25
Entrepreneur	8
Teacher	3
Civil-servant	4
Farm laborer	21
Industry laborer	8
Fish Cultivator/Farmer	112
Education Level	
Bachelor's Degree	3
Primary school	35
Junior high school	23
Senior high school	120
Income based UMK	
Below UMK	9
Above UMK	172

Based on the age of the respondents, the highest frequency fell in the age range of 40-44 years with 39 households. The age of the respondents indicates that most of this program's participants are of productive age. The main respondent occupation describes the dominant economic activity. People who cultivate fish as the primary occupation make up the majority of respondents (112, or 61,88%). The characteristics on educational level of the respondents were divided into four categories. The higher education level of the respondent's characteristic and income they get. The characteristics of the respondent's income are used to determine the average monthly income in Soko Village. The income level of the people of Soko Village is influenced by their work. The average income of respondents is significantly above the UMR of Lamongan Regency. So, if it is related to the community's welfare it's categories good.

3.3. Characteristics of Social Capital

Social capital is a series of informal values owned by group members that culminates into cooperation [23]. Putnam [21] revealed that social capital is a model owned by the community and has the characteristics of social organization

as social networks, norms, and beliefs that will facilitate things that can be beneficial.

The characteristics of the community's social capital in Soko Village were measured using responses from the questionnaires distributed to the community. The responses were analyzed using descriptive analysis to find out and explain the distribution and frequency of the data. Thus, the result of the Soko Village Community's social capital is categorized as "good social capital." As evidence by the dominant score of 4 in every item indicator by the respondents.

3.3.1. Trust

As shown by honest behavior, trust is an expectation that grows in society [23]. Indeed, an element of trust will build a sense of responsibility and that of being valued, which will lead to reciprocal trust. A relationship of mutual trust will determine interactions between stakeholders in the fishing area without any worries that it can lead to fraud [18].
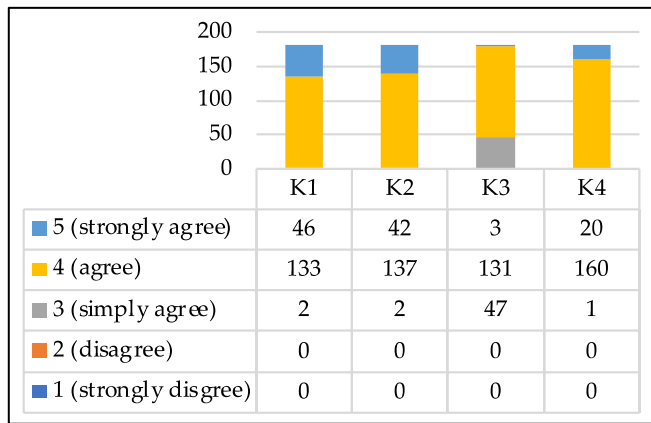
	K1	K2	K3	K4
5 (strongly agree)	46	42	3	20
4 (agree)	133	137	131	160
3 (simply agree)	2	2	47	1
2 (disagree)	0	0	0	0
1 (strongly disagree)	0	0	0	0

Figure 3. Trust Characteristics

As shown by **Figure 3** trust of the community (K1), was dominated by answer 4 agreed by 73.48%. Trust within the community is manifested by the high willingness of the community to support their neighbors when they need it. Trust between members of the cultivation group (K2), is dominated by an answer 4, neighbors being willing to provide labor, advice, and money when other neighbors need it. The trust between communities and cultivation groups give a good impact for the sense of kinship between community members.

Trust of the government (K3) is dominated by 72.38% of respondents, indicating 4, trusting the village government because it can provide clear information to the village community. However, 25.97% of respondents answered that they only simply agreed. As a result, the public's trust in the government is considered "simply good". Trust of the community leaders (K4), was dominated by 88.40% respondents indicating, a 4 "agreed" that the community leaders can protect and were consistent in holding the values of truth and honesty. The public's trust in community leaders is classified "good".

3.3.2. Network

A dynamic infrastructure in social capital is a network of cooperation between people that facilitates communication

and interaction, thereby enabling the growth of trust and strengthening cooperation [21]. A good network in the aquaculture area will create a sustainable function for the area [18]. The following is characteristics of network (**Figure 4**).

Social interaction in maintaining good relations (J1) 91,16% of respondents answered agreed with a score of 4 agreeing. This is realized by the active participation of the community in the ADD program deliberations, the socialization of agricultural and fisheries activities, fisheries counseling, PKK activities, and women's empowerment activities. Ability to build associations and networks (J2), 78.45% of respondents answered, "score 4" and agreed. realized by the willingness of the community to work together to achieve mutual success without expecting personal gain. Cooperation Between Cultivators (J3): 90,06 respondents answered, "score 4 agreed". Some of these cooperation activities are usually carried out during seed cultivation activities, fish harvesting activities, and the processing of fishery products.
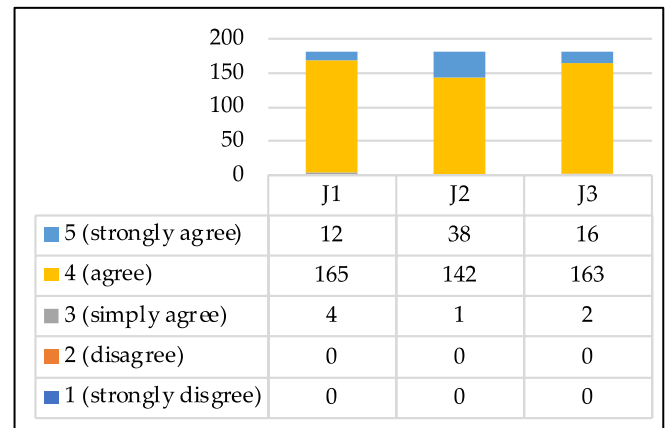
	J1	J2	J3
5 (strongly agree)	12	38	16
4 (agree)	165	142	163
3 (simply agree)	4	1	2
2 (disagree)	0	0	0
1 (strongly disagree)	0	0	0

Figure 4. Network Characteristics

3.3.3. Norm

Norms are defined as a social right in controlling action by others. Norms consist of understanding, values, hopes and goals that are believed and run together by a group. The following is characteristics of norms. The following (**Figure 5**) represent norm chart.

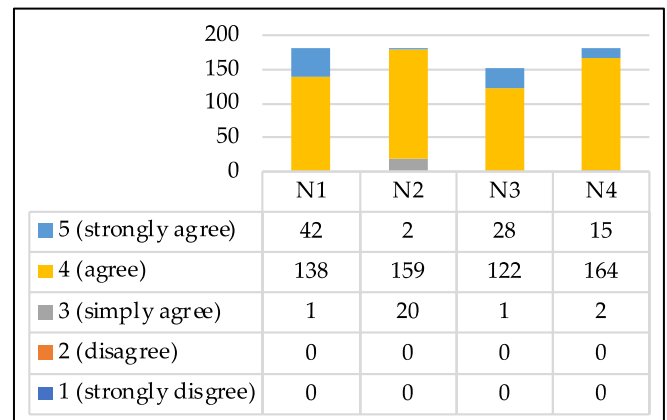|	N1	N2	N3	N4
5 (strongly agree)	42	2	28	15
4 (agree)	138	159	122	164
3 (simply agree)	1	20	1	2
2 (disagree)	0	0	0	0
1 (strongly disagree)	0	0	0	0

Figure 5. Norm Characteristics

For obedience to religious values (N1), 76.24% of respondents answeres 4 (agreed). This indicates that community adherence to religious values is good because

people often participate in religious activities in the village. For obedience to cultural values (N2), 87.85% of respondents answered 4 (agreed). Several village traditions that are usually carried out are village community service, village cleaning, and village hauling. For obedience to the local constituent (N3), 67.40% of respondents answered 4 (agreed). This indicates that the village community obeys the regulations made by the local government. For rules understood by members of the cultivation (N4), 90,61% of respondents answered 4 (agreed). It is realized that respondents who are members of fish cultivator or pond farmer groups rarely have a different understanding of the norms and values that apply to fish cultivator groups.

3.4. Characteristics of Community Participation

According to Hajar [24] community participation is the increase in the ability of everyone directly or indirectly involved in any program or government policy by involving the community in making decisions.

For knowledge of the aquaculture center development program (Y1), 88,40% of respondents answered 4 (agreed). This indicates that the majority of the people in Soko Village know information about program implementation. For collaboration and activeness in program implementation (Y2), 86,19% of respondents answered 4 (agreed). It's manifested by the large number of people who often participate in aquaculture activities, especially in the breeding, harvesting and processing of fishery products in Soko Village. For participation in the cultivation group (Y3), 76,24% of respondents answered 4 (agreed). Participation manifested by the older people who are willing to participate in aquaculture groups without expecting profit. Some of the activities in the cultivation group are fisheries counseling and procuring seeds. For the ability to make decisions and give opinions (Y4), 81,22% of respondents agreed on score 4 and 15,47% answered 3 (simply agree). The ability of community cultivator to make decisions and opinions is "simply good". community decision making is manifested by the large number of people who often give their opinions to each association on breeding process when irrigating the ponds. The following (**Figure 6**) represents the chart of community participation.

3.5. Confirmatory Factor Analysis

The confirmatory factor analysis aims to find out the indicators that influence social capital including trust, network, and norm. An indicator meets the criteria when it fulfills the requirements for a loading factor> 0.7. If there are indicators that do not meet the criteria, it is necessary to modify the model by reducing indicators that do not meet. The following is Confirmatory Factor Analysis (CFA) step 1 model.

In the first step 1 (**Figure 7**) of CFA Analysis, there were several indicators that did not meet the requirements based on a loading factor > 0.7, so it was necessary to modify the model. The following is loading factors of social capital in Confirmatory Factor Analysis (CFA) step 1.

Some indicators that are not valid in the first step of the Confirmatory Factor Analysis (**Table 4**) are indicators of trust in the government (K3), and also adherence to cultural values (N2).

Indicators that did not meet the value of the loading factor are considered unable to measure the latent variable, (social capital). The next step was to carry out the second stage of confirmatory factor analysis (CFA) after reducing invalid indicators in the first step of Confirmatory factor analysis (CFA) (**Figure 8**), where the social capital formed by trust, network, and norms.
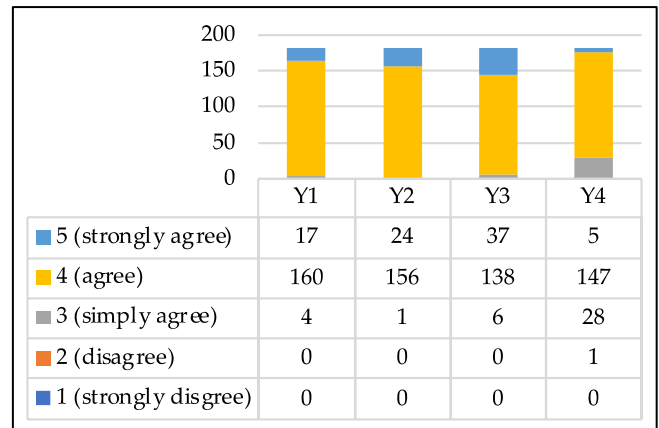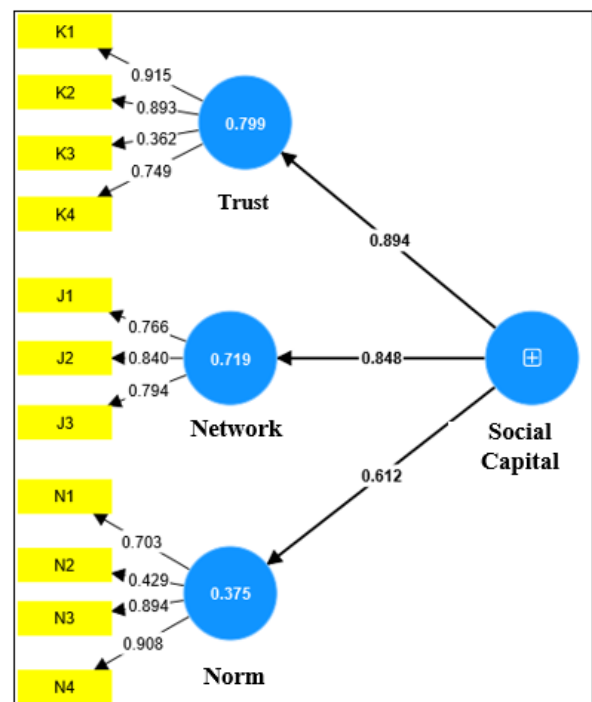

Figure 6. Community Participation Characteristics

	Y1	Y2	Y3	Y4
■ 5 (strongly agree)	17	24	37	5
■ 4 (agree)	160	156	138	147
■ 3 (simply agree)	4	1	6	28
■ 2 (disagree)	0	0	0	1
■ 1 (strongly disgree)	0	0	0	0

Figure 7. CFA Step 1

Table 4. Loading Factors of Social Capital in CFA Step 1

Variable	Indicator	Loading Factor	Validity
Network	J1	0,766	Valid
	J2	0,840	Valid
	J3	0,794	Valid
Trust	K1	0,915	Valid
	K2	0,893	Valid
	K3	0,362	Invalid
	K4	0,749	Valid
Norms	N1	0,703	Valid
	N2	0,429	Invalid
	N3	0,894	Valid
	N4	0,908	Valid

Figure 8. CFA Step 2
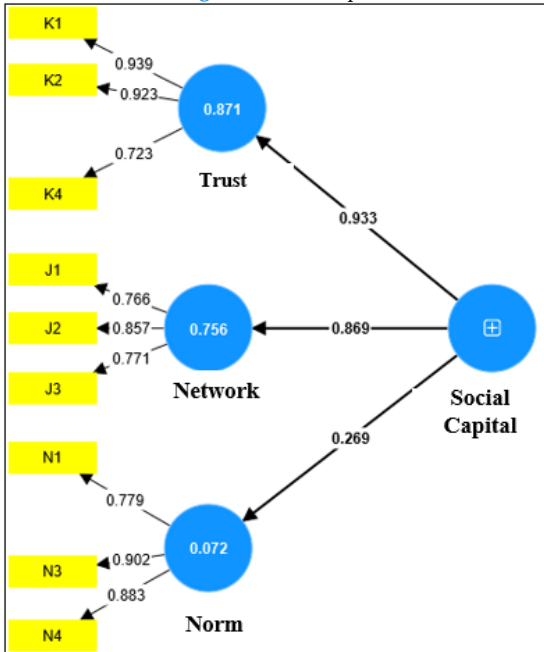
Table 5. Loading Factors of Social Capital in CFA Step 2

Variable	Indicator	Loading Factor	Validity
Network	J1	0,766	Valid
	J2	0,857	Valid
	J3	0,771	Valid
Trust	K1	0,939	Valid
	K2	0,923	Valid
	K3	0,723	Valid
	K4	0,779	Valid
Norms	N1	0,902	Valid
	N2	0,883	Valid
	N3	0,766	Valid
	N4	0,857	Valid

The trust variable is formed by 3 indicators (Table 5), K1, K2, and K4. None of the network variables are omitted, so it is formed by 3 indicators J1, J2 and J3 with a loading value of 0.766 to 0.857. The norm variable is formed by 3 indicators namely N1, N2, and N3. The most influence variable that build social capital in Soko Village is the trust variable with R Square value is 0.871 or 87.1%. While the network has an influence of 0.756 or 75.6%. The norm has the smallest impact with the value 0.72 or 7.2%.

3.6. Structural Equation Modeling

Model 1 is used to describe the latent variable model of social capital and community participation. The following is the first model of the path diagram of the relationship between social capital and community participation. In the path diagram developed, there is a direct relation between each of the social capital variables and also community participation. The first model's feasibility test identifies the outer model of the influence of social capital and food security. The indicators in the social capital variable are the result of the CFA. The following (Figure 8) SEM Model 1 examines the relationship between social capital and community participation.

Based on the path coefficients in (Figure 9) there is a direct effect with a significant positive relationship to the social

capital and community participation variables with loading factor value in (Table 6).
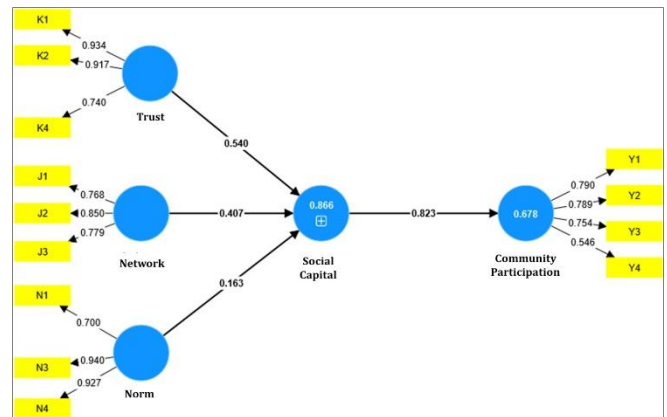

Figure 9. SEM Model 1 Social Capital and Community Participation

Table 6. Loading Factors Model 1

Variable	Indicator	Loading Factor	Validity
Network	J1	0,768	Valid
	J2	0,850	Valid
	J3	0,779	Valid
Trust	K1	0,934	Valid
	K2	0,917	Valid
	K4	0,740	Valid
Norms	N1	0,700	Valid
	N3	0,940	Valid
	N4	0,927	Valid
Participation	Y1	0,790	Valid
	Y2	0,789	Valid
	Y3	0,754	Valid
	Y4	0,546	Invalid

Based on (Table 6) loading factor of SEM model 1, the results of the instrument feasibility test contained 1 indicator in the community participation variable (Y4), which needed to be reduced. Model modification will be carried out in model 2 by reducing indicators that do not meet the requirements for loading factor Y2 because they are considered unable to be explained by the latent variable community participation.
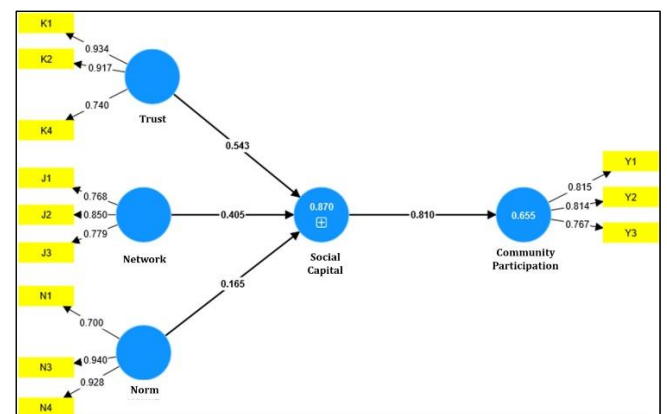

Figure 10. SEM Model 2 Social Capital and Community Participation

Based on the results of the feasibility test of the model instrument (Figure 10), it shows that all indicators for each

variable meet the requirements for a loading factor > 0.7, so there is no need to reduce indicators by removing them.

The endogen latent variable of community participation in program implementation (Y) (**Table 7**) is built by 3 indicators Y1, Y2, and Y3. The results of the structural equation model are constructed by two sub-models, namely the inner model (measurement model) and the outer model (structural model). The inner model is used to determine the relationship between latent variables (constructs), while the outer model is a model used to determine the relationship between observable variables (indicators) and the underlying construct. Based on the two (2) inner models that have been formed, the model that most meets the requirements and describes the variables of social capital and community participation because it has a loading factor value that meets the eligibility requirements of the model is model 2. The following is the result SEM Model and T-statistics that describes the signification of the relationship between social capital and community participation.

Table 7. Loading Factors Model 2

Variable	Indicator	Loading Factor	Validity
Network	J1	0,768	Valid
	J2	0,850	Valid
	J3	0,779	Valid
Trust	K1	0,934	Valid
	K2	0,917	Valid
	K4	0,740	Valid
Norms	N1	0,700	Valid
	N3	0,977	Valid
	N4	0,981	Valid
Participation	Y1	0,815	Valid
	Y2	0,814	Valid
	Y3	0,767	Valid
	Y4	0,768	Valid

Figure 11 shows the T value of each indicator on latent variables and their effects. The magnitude of the significance of the effect can be seen from the p-value compared to the T value. Exogenous variables significantly affect if the p value < 0.05 or T Statistics > 1.96. In addition, the coefficient of determination (R Square) is between 0-1. The following (

Table 8) show the results of the significance test of the relationship and the influence of the model.
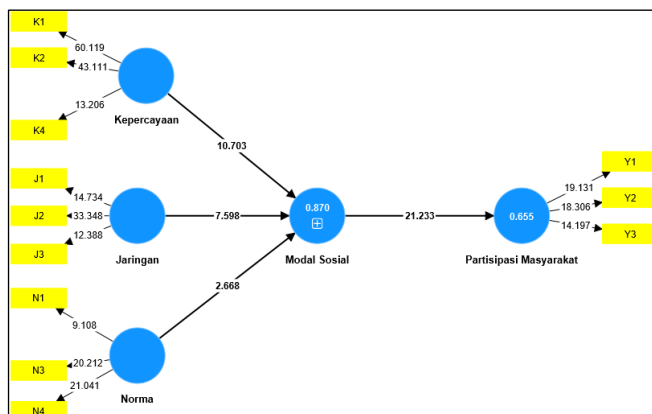

Figure 11. SEM Model and T-Statistics

Table 8. The Signification Effect Value

Causal Effect	T Statistic	P Value	Signification
Network-> Social Capital	7,598	0,000	Significant
Trust -> Social Capital	10,703	0,000	Significant
Social Capital -> Community Participation	21,233	0,000	Significant
Norms -> Social Capital	2,668	0,008	Significant

Table 8 shows a significant positive direct effect between participation and social capital with the sub-variables of network, trust, and norms. The social capital indicator variable and the social capital exogenous variable have a significant positive effect, so each indicator greatly influences the existing social capital in Soko Village. The causal relationship between social capital and community participation has a significant positive correlation coefficient. So that the good social capital owned by the Soko Village community will influence the active participation of the community in implementing the aquaculture center development program.

Based on the R Square value of social capital owned by cultivator households, which is equal to 0.870, 87% of social capital aspects can be explained in this study. Whereas the community participation variable in the implementation of the aquaculture center development program has an R Square value of 0.655, it can be concluded that community participation in this study can be explained by 65.5%. Based on the t-statistic value of 21.233, the relationship between social capital and community participation is directly proportional, which means that it is significantly positive whether in good or bad conditions social capital will affect community participation. If it is related to the model, it is proven that there are several indicators in social capital that have not been maximized so that there are indicators in community participation that are not optimal either. This shows that the findings are relevant to previous research where community involvement and social capital become an inseparable relationship, each individual is expected to be able to increase social capital through the involvement of a community group [12], [13].

The social capital of the Soko Village community built by trust, networks, and norms is categorized as good. Community trust, especially the fish cultivating community, is formed by the existence of trust in fellow communities, trust between cultivators, and also trust in community leaders who have greater forming values than other beliefs. This element of trust is formed because of the interaction relationship to the impact of the interaction that exists between cultivating communities. The existence of a sense of trust between communities gives rise to networks and close relationships between communities and leaders in the village. It is argued that the existence of this trust will impact the on active community to carry out cooperative relations in the business of aquaculture activities, religious activities, and social

activities of the village which refers to applicable customary norms. Even though the social capital owned by the Soko Village community is categorized as good, several indicators still cannot be explained in this study based on the results of the SEM analysis. These unexplained indicators are due to weak trust in the government. The cultivating community views that the government gives unequal attention to the cultivating community in obtaining assistance and training in aquaculture activities due to the lack of access to all cultivators to join the Fish Cultivator Group (POKDAKAN). This condition ultimately has an impact on weak indicators of assessing cultural norms, a lack of trust in the government, causing not many people to have high enthusiasm in carrying out cultural activities in the village. If it is related to the demographic characteristics of the respondents, this is related to the occupation and age of the respondents. Respondents who fall within the age range of 20 to 29 years, tend to rarely participate in cultural activities in the village because they also work as industrial workers where shifts determine their working hours, so they rarely join actively in cultural activities. Meanwhile, based on job characteristics, respondents who make cultivation activities as a side job also rarely participate in existing cultural activities because of the demands of the main job that needs to be prioritized.

Conditions of social capital that are considered weak and unfavorable will affect the less active participation of fish cultivating communities in program implementation. Based on the results of the analysis above, there is a weak indicator in participation, the lack of involvement of the community in decision-making activities in aquaculture activities. The weak indicators are also driven by weak social capital and trust in the government because not all farming communities have access to join the Fish Cultivation Group (POKDAKAN). Therefore, trust has a big role in increasing social capital owned. This is in line with previous research where trust was found to facilitate cooperation in society. Trust arises from a relationship that is norm and a network of community linkages [22].

4. Conclusion

Social capital is a community support in resolving problems in aquaculture areas such as Soko Village of Glagah District. The social capital owned by the Soko Village community builds trust (X1), which consists of trust of the community (K1) ; trust between members of the cultivation group (K2); and trust of the community leader (K4), the network (X2) consists of social interaction in maintaining good relation (J1); ability to build association and networks (J2); and cooperation between cultivators (J3), as well as the norm (X3), consists of obedience to religious values (N1); obedience to cultural values (N3); and rules understood by members of the cultivation (N4).

From the result above, it can be evaluate in implementing program from the policy that implementing in Lamongan Regency. Based on the result, in implementing the implementation of aquaculture center in Soko Village, the government's role in building public trust needs to be increased to increase social capital owned by the community. It's because the weak of social capital will affect the less active

participation of cultivating communities in program implementation. So that the success and sustainability of the program will be realized.

Based on the results of the SEM analysis, the relationship between social capital and community participation in the implementation of the aquaculture central development program shows a significant positive relationship between social capital and active community participation. The exogenous latent variable (social capital) is directly related to the endogenous latent variable (community participation). The goodness of social capital will affect the active participation of the community.

Author Declaration

Authors' contributions and responsibilities

The authors made substantial contributions to the conception and design of the study. The authors took responsibility for data analysis, interpretation and discussion of results. The authors read and approved the final manuscript.

Funding

No funding information from the authors.

Availability of data and materials

All data are available from the authors.

Competing interests

The authors declare no competing interest.

Additional information

No additional information from the authors.

References

[1] Central Bureau of Statistics, "Kabupaten Lamongan," 2022. https://www.bps.go.id/indicator/11/554/1/-seri-2010-sumber-pertumbuhan-pdb-seri-2010.html (accessed Oct. 31, 2022).

[2] I. N. Edrus and S. Suprapto, "Arah Kebijakan Pengembangan Perikanan Tangkap Di Sekitar Teluk Saleh, Nusa Tenggara Barat," *Jurnal Kebijakan Perikanan Indonesia*, vol. 5, no. 1, pp. 25–38, 2013.

[3] T. P. Setiawan, E. Ebrilyani, and E. N. Azilla, "Modal sosial dalam keberlanjutan pertanian di tengah alih fungsi lahan di Kelurahan Bintoro Kecamatan Patrang Kabupaten Jember," *Agricore: Jurnal Agribisnis dan Sosial Ekonomi Pertanian Unpad*, vol. 5, no. 1, 2020.

[4] E. Siankwilimba, J. Hiddlestone-Mumford, B. M. Hang'ombe Mudenda, C. Mumba, and M. E. Hoque, "COVID-19 and the Sustainability of Agricultural Extension Models," *International Journal of Applied Chemical and Biological Sciences*, vol. 3, no. 1, pp. 1–20, 2022.

[5] N. Uphoff, "Understanding social capital: learning from the analysis and experience of participation," *Social capital: A multifaceted perspective*, vol. 6, no. 2, pp. 215–249, 2000.

[6] A. T. Charles, *Sustainable Fishery Systems*. Oxford UK: Blackwell Science, 2001.

[7] Y. A. Wahyudi, U. Yanuhar, and M. Maftuch, "Expression of Hsp70 and β-actin Genes as The Immune Response against Viral Nervous Necrosis that Infected Asian Seabass (Lates calcalifer)," *The Journal of Experimental Life Science*, vol. 8, no. 3, pp. 139–146, 2018.

[8] H. Baha, "An introduction of descriptive analysis, its advantages and disadvantages," *Unpublished Thesis, Leuphana University of Lüneburg*, 2016.

[9] G. Prayitno, A. Hayat, A. Efendi, H. Tarno, Fikriyah, and S. H. Fauziah, "Structural Model of Social Capital and Quality of Life of Farmers in Supporting Sustainable Agriculture (Evidence: Sedayulawas Village, Lamongan Regency-Indonesia)," *Sustainability*, vol. 14, no. 19, p. 12487, 2022.

[10] C. Hunecke, A. Engler, R. Jara-Rojas, and P. M. Poortvliet, "Understanding the role of social capital in adoption decisions: An application to irrigation technology," *Agricultural systems*, vol. 153, pp. 221–231, 2017.

[11] R. V Krejcie and D. W. Morgan, "Determining sample size for research activities," *Educational and psychological measurement*, vol. 30, no. 3, pp. 607–610, 1970.

[12] A. Ogunleye, A. Kehinde, A. Mishra, and A. Ogundeji, "Impacts of farmers' participation in social capital networks on climate change adaptation strategies adoption in Nigeria," *Heliyon*, vol. 7, no. 12, p. e08624, 2021.

[13] D. Tahlyan, A. Stathopoulos, and M. Maness, "Disentangling social capital–Understanding the effect of bonding and bridging on urban activity participation," *Transportation research interdisciplinary perspectives*, vol. 15, p. 100629, 2022.

[14] A. Setiawan, W. Pusporini, and H. Dardjito, "Observation instrument for student social attitude in primary schools: Validity and reliability," *Jurnal Penelitian Dan Evaluasi Pendidikan*, vol. 24, no. 1, pp. 76–87, 2020.

[15] S. Nasution, "Variabel penelitian," *Jurnal Raudhah*, vol. 5, no. 2, 2017.

[16] K. G. Ahmed, "Social Capital of Local Communities: The Absent Dimension in Urban Regeneration Projects in Cairo, Egypt," in *Symposium of Urban Development of Northern District Governorate in the Kingdom of Bahrain*, 2008, pp. 1–14.

[17] A. T. Nugraha, R. Rahmawati, A. Auliah, and G. Prayitno, "Farmers' social capital in supporting sustainable agriculture: the case of Pujon Kidul tourism village, Indonesia," 2022.

[18] Y. Pertiwi, E. Rustiadi, and D. P. Lubis, "The role of fish farmers group in the development of minapolitan area in Pasekan District of Indramayu Regency," *Jurnal Penyuluhan*, vol. 14, no. 2, pp. 222–233, 2018.

[19] G. Prayitno, D. Dinanti, A. Efendi, A. Hayat, and P. P. Dewi, "Social capital of Pujon Kidul communities in supporting the development of the COVID-19 resilience village," *International Journal of Sustainable Development and Planning*, vol. 17, no. 1, pp. 251–257, 2022.

[20] B. M. R. Farisa, G. Prayitno, and D. Dinanti, "Social Capital and Community Participation on Infrastructure Development in Pajaran Village, Malang Regency Indonesia," in *IOP Conference Series: Earth and Environmental Science*, 2019, vol. 239, no. 1, p. 12046.

[21] R. D. Putnam, *Bowling alone: The collapse and revival of American community*. Simon and schuster, 2000.

[22] A. B. Zamroni, "Modal Sosial dalam Pelaksanaan Program Desa Mandiri Pangan di Desa Ngadirojo Kabupaten Pacitan." Universitas Brawijaya, 2018.

[23] F. Fukuyama, "Social Capital and Civil Society/Francis Fukuyama," *The Institute of Public Policy George Mason Universuy.–1999.–October*, vol. 1, 1999.

[24] S. Hajar, I. S. Tanjung, and Y. Tanjung, *Pemberdayaan dan Partisipasi Masyarakat Pesisir*. Lembaga Penelitian dan Penulisan Ilmiah AQLI, 2018.