ALTERNATIVES OF FOOD SECURITY MODEL ON THE FARMER'S HOUSEHOLD THROUGH SOCIAL EMPOWERMENT IN TARAKAN

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ABSTRACT: *Food Security through social empowerment can be brought into reality if the public gets involved directly on each process of Food Security achievement in all aspects that include food availability, accessibility, and food absorption. Objective of the research was to study alternatives of Food Security model on the farmer's household through social empowerment in Tarakan. Data analysis of the research used the Generalized Structure Component Analysis (GSCA). Result of the research showed that description of the Food Security model of the farmer's household through empowerment is welfare (Z), which is affected by Food Security Levels (Y4), in which the Food Security Level (Y4) is more dominant and affected by behavioral changes (Y3), while the social empowerment process (Y2) is directly insignificant in affecting the Food Security Level (Y4), but it could significantly affect through behavioral changes (Y3) variable. Besides that, direct participation (Y1) has insignificant effect on Food Security Level (Y4), but it could have significant effect through social empowerment process (Y2) and behavioral changes (Y3). The social empowerment process (Y2) is dominated by the effect of participation (Y1), in which participation (Y1) is dominated by the effect of innovation (X2) of post harvest (X3).*

KKEYWORDS : Food Sustainability, Farmer's Household, Social Empowerment

INTRODUCTION

Food Security plays strategic role in national development, due to it does not only cover definition of sufficient food availability, but also ability to access (including buy) the food and no food-dependency on any party. Food susceptibility may occur if sufficient food availability is not gone along with adequate access for food and optimal absorption of food. The production capacity of food is determined by the production factor as it affects high and low production that includes land width, social education, capital, and farming operation management. Today, the national production of food is still inhibited by competition in utilization and decreasing quality of natural resources and human resources, application of efficient technology that has not been effective yet. If such problem could not be well-anticipated, it may disturb the short-term and long-term national food balances. Therefore, implementation of the national Food Security system requires optimal natural resources management, sufficient human resources management, agricultural means and infrastructures supply, as well as effective and efficient technology application and development.

The Board of Food Security (2011) identified the problems of food in Indonesia, which have become the obstacle in bringing the national Food Security into reality, such as : (1) the

population growth rate is relatively high (1.2% per year on average), (2) numbers of population, which are seriously affected by the food, are still large enough, even though it shows the decreased trend, (3) conversion of the farming land is still high and it is difficult to be controlled, (4) the increasing competition in utilizing water resources, (5) high dependency on rice has not been balanced with utilization of local food optimally, (6) food reserves of the government have still limited (only rice and it is only at the central government), meanwhile food reserves of the local government and society have not developed, (7) lower quality and quantity of food consumption, due to the influence of culture and habit of eating that have not conformed to the food consumption, which is safe, varying, and well-matched nutrition, (8) less developed local material-based food industries to support variability of foods, (9) frequent occurrence of food poisoned that cause low quality of nutrition at the society, (10) insufficient means and infrastructures of transportation cause high cost that must be expended for distribution of the foods to the consumers.

In fact, the most susceptible Food Security is on the farmer's community as the food producers, in which the dominant proportion (61%) of food susceptibility in Indonesia is on the agricultural households, while non-agricultural households have less dominant (33%) proportion. Higher proportion of food susceptibility has also occurred on agricultural households (14%) in comparison with the urban households (8%). Food Security proportion of the agricultural households has still 18%, while non-agricultural households reach 43% (Sitorus, 2013). Therefore, social empowerment, particularly the agricultural households, has become the main focus of concern in Food Security development.

In fact, Food Security development is the social empowerment, which means that it increases self-supporting and capacity of the public to play actively in providing food availability, distribution, and consumption from time to time. Social empowerment can be applied by improving human resources (HR) capacity in order to be more competitive in entering the workforce market and opportunity to create and increase income of the households. Such income increasing, of course, will increase the purchasing power of the households to access the foods. The purchasing power will provide freedom to choose the various foods that have nutritive contents. Therefore, food stabilization means not only provide economical foods, but also increase the purchasing power.

One of efforts to achieve Food Security has been conducted by the government, such as implementing the strategy design through empowerment program. In implementing the program, social involvement of the farmers in the form participation is required, starting from production process, processing, distribution, and marketing, as well as services in food aspect, while the government's facilities are implemented in the form of macro-and-micro economic policies in trade sector, services and arrangement, as well as intervention to support the realization of self-supporting for foods.

The geographic location of Tarakan lies at the altitude ± 110 meter above sea level (asl), which means that it lies on lowland, and there are specific commodities that can be cultivated and grown well on such condition. The commodities include horticultural plants specified for lowland and crops (Central Bureau of Statistics in Tarakan, 2013). Tarakan does not belong to areas that produce food materials, due to most of the available foodstuffs are derived from outside of this area, for instance, rice and vegetables (Sulawesi, Java and Malaysia), therefore

the food stock management should be more concerned in order to guarantee the supply of foodstuffs. As an archipelago area, the transportation access to Tarakan can only be taken using air and water transportation, and that is why the distribution costs are higher than in other areas, in which it leads to higher prices for qualified foodstuffs.

Based on result of the research by Hamid et al (2013), a part of area in Tarakan has still low value (78.73%) for the Expected Food Pattern (EFP), based on quantity from the standard of 2000 kcal/capita/day, and based on the quality aspect, the entire areas is still low from the standard of determined actual EFP (100), 60.27 – 82.14. Consumption level of rice in Tarakan is still higher, 113 kg/capita/year, than the given standard, 95 kg/capita/year, which means that diversification of food consumption is still less. Based on the problem above, alternative model of Food Security for the farmer's households should be formulated to achieve Food Security of households in Tarakan through social empowerment in Tarakan.

METHOD OF THE RESEARCH

The research was conducted in Tarakan, location of the research was determined purposively in Tarakan, North Kalimantan Province, by considering: (1) There are some social empowerment programs in Tarakan, which are intended to increase food sustainability, (2) Tarakan is an archipelago area that highly depends on food supply (rice) from other areas. The research was conducted from July 2014 to November 2014. Samples were taken as simple random, out of the whole population of farmers who get the social empowerment program of P2KP (*Percepatan Penganekaragaman Konsumsi Pangan*) or Acceleration of Food Consumption Variability, 42 out of 120 people were taken as samples. It refers to opinion by Arikunto (2006) that if objects of the research are more than 100, 10-15% or 20-25% of them can be taken as samples, or more depend on time, power/energy, fund, area width of the observation, or the amount of data, the risk of the research, and homogeneity of the samples.

The Generalized Structure Component Analysis (GSCA) is applied to formulate alternative of the Food Security model of the farmer's households. According to Gozali (2008), The Variance Based or Component Based-approach along with GSCA that is oriented to predictive analysis (predictive model), besides that it can be used to confirm theory/model with the empirical data. Steps in forming the structural equation are as follow : (1) Specification of Model; (a) Measurement model, (b) Structural model, (2) Goodness of Fit; (a) FIT, (b) AFIT, (c) GFI, (d) SRMR, (3) Measurement model, (4) Structural model. Indicator and parameter, which were used in this research, are presented in table below.

Table 1. Indicator and Parameter of the Research.

Indicator	Parameter
Production Factor (X1):	Measured from : Natural resources (X1.1), Human resources (X1.2), Capital (X1.3), Management (X1.4)
Innovation (X2)	Measured through aspects : Advantage (X2.1), Suitability (X2.2), Complication (X2.3), Experimentation (X2.4), Visible (X2.5)
Post Harvest (X3) :	Measured through : Sorting (X3.1), Packaging (X3.2)
Marketing (X4)	Measured through : Marketing channel (X4.1), Promotion (X4.2)
Participation (Y1) :	Measured through : Intensity in activity (Y1.1), Quality of participation (Y1.2), Quality of Benefit (Y1.3)
Social Empowerment Process (Y2)	Measured through : Education (Y2.1), Capital Assistance (Y2.2), Assistance (Y2.3)
Behavioral Changes (Y3)	Measured through : Knowledge (Y3.1), Attitude (Y3.2), Skill (Y3.3)
Food Security Level (Y4) :	Measured through : Food availability (Y4.1), Access to food (Y4.2), Food absorption (Y4.3)
Welfare (Z)	Measured through : Income (Z1.1), staple food availability (Z1.2), Expense/ consumption for food of the households (Z1.3)

RESULT AND DISCUSSION

1. Model Specification
Such initial model was formulated and based on a theory or the previous research. Bollen (1993) stated that the analysis would not be started till the researcher specifies a model, which shows the correlation among variables that are going to be analyzed. Specification of the structural model, construct or latent variable could not be measured directly. Therefore, they must be measured through manifest variable or the observed variable. In general, specification of the Measurement model can be described as follow:
1) Latent variable of production factor (ξ_1) is measured by 2 observed variables, X1.3 and X1.4.
2) Latent variable of innovation (ξ_2) is measured by 3 observed variables, X2.2, X2.3 and X2.4.
3) Latent variable of post harvest (ξ_3) is measured by 2 observed variables, X3.1 and X3.2.
4) Latent variable of marketing (ξ_4) is measured by 1 observed variable, X4.1.
5) Latent variable of participation (η_1) is measured by 3 observed variables, Y1.1, Y1.2 and Y1.3.

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6) Latent variable of social empowerment process (η_2) is measured by 2 observed variables, Y2.1 and Y2.3.

7) Latent variable of behavioral changes (η_3) is measured by 2 observed variables, Y3.1 and Y3.3.

8) Latent variable of Food Security Level (η_4) is measured by 2 observed variables, Y4.1 and Y4.2.

9) Latent variable of welfare (η_5) is measured by 3 observed variables, Z1, Z2 and Z3.

Those observed variables have represented indicators as the strongest factors and have loading factor value as the maker of their latent construct.

2. Goodness of Fit

Goodness of fit on the whole model uses the rule of thumbs on measurement of GOF and result of GOF statistic, therefore goodness of fit analysis of the whole model can be applied as follow:

Table 2. Result for Goodness of fit Index (GOF).

Goodness of fit Index	Cut of Value	Result	Description
FIT	> 0.500	0.692	Good fit model
AFIT	> 0.500	0.673	Good fit model
GFI	> 0.900	0.955	Good fit model
SRMR	< 0.080	0.388	Marginal fit model

3. Measurement Model

Recapitulation of reliability and validity evaluation results is presented in Table 3 as follow:

Table 3. Evaluation on Validity and Reliability of the Exogenous Variable.

Latent Variable	Observed Variable	Validity of CFA			Reliability of Alpha Cronbach		
		Loading Factors	Rule of Thumb	Conclusion	Reliability	Rule of Thumb	Conclusion
Production factor (X1)	X1.3	0.966	0.500	Valid	0.724	0.700	Reliable
	X1.4	0.916	0.500	Valid			
Innovation (X2)	X2.2	0.969	0.500	Valid	0.897	0.700	Reliable
	X2.3	0.956	0.500	Valid			
	X2.5	0.8	0.500	Valid			
Post harvest (X3)	X3.1	0.996	0.500	Valid	0.983	0.700	Reliable
	X3.2	0.985	0.500	Valid			
Marketing (X4)	X4.1	1.000	0.500	Valid	0.000	0.700	Not Reliable

Based on the table above, it shows that the structural equation, value of the standard loading factors is higher than 0.50. Therefore, it can be concluded that validity of the structural equation on manifest variables toward the latent variables is good. Meanwhile, based on result of the reliability calculation, it shows that structural equation of the reliability value is

higher than 0.70, so that it can be concluded that structural equation of the latent variables has good reliability.

Table 4. Evaluation on Validity and Reliability of the Endogenous Variable

Latent Variable	Observed Variable	Validity of CFA			Reliability of Alpha Cronbach		
		Loading Factors	Rule of Thumb	Conclusion	Reliability	Rule of Thumb	Conclusion
Participation (Y1)	Y1.1	0.971	0.500	Valid	0.923	0.700	Reliable
	Y1.2	0.961	0.500	Valid			
	Y1.3	0.880	0.500	Valid			
Social Empowerment Process (Y2)	Y2.1	0.931	0.500	Valid	0.722	0.700	Reliable
	Y2.3	0.835	0.500	Valid			
Behavioral Changes (Y3)	Y3.1	0.918	0.500	Valid	0.804	0.700	Reliable
	Y3.3	0.910	0.500	Valid			
Food Security Level (Y4)	Y4.1	0.946	0.500	Valid	0.907	0.700	Reliable
	Y4.2	0.966	0.500	Valid			
Welfare (Z)	Z1	0.680	0.500	Valid	0.831	0.700	Reliable
	Z2	0.920	0.500	Valid			
	Z3	0.961	0.500	Valid			

Based on table and figure above, it shows that the structural equation of the standard loading factor values is higher than 0.50, therefore it can be concluded that validity of the structural equation on manifest variables toward the latent variables is good. Meanwhile, based on result of the reliability calculation, it shows that structural equation of the construct reliability value is higher than 0.70. It means that structural equation of the latent variables has good reliability.

4. Structural Model
The causal correlation is considered insignificant if the critical ratio (CR) value is between the range -1.96 and 1.96 by the significance level of 0.05. By the assistance of application GSCA program, it results the estimation of critical ratio value of the structural model. In short, the calculation results of those coefficients are presented in the table below:

Table 5.   Result of Estimation and Hypothesis Testing.

Latent Variable			Coefficient of Line	Direct Influence	CR	Conclusion
Exogenous	>	Endogenous				
Production Factor (X1)	>	Participation (Y1)	-0.664	44.09%	0.88	Insignificant
Innovation (X2)	>		0.639	40.83%	3.08*	Significant
Post Harvest (X3)	>		0.381	14.52%	2.98*	Significant
Marketing	>		0.659	43.43%	1.18	Insignificant

(X4)						
Participation (Y1)	>	Social Empowerment Process (Y2)	0.993	98.60%	3.44*	Significant
Production Factor (X1)	>		0.724	52.42%	0.94	Insignificant
Innovation (X2)	>		-0.224	5.02%	0.65	Insignificant
Post Harvest (X3)	>		-0.515	26.52%	1.6	Insignificant
Marketing (X4)	>		-0.527	27.77%	1.01	Insignificant
Social Empowerment Process (Y2)	>	Behavioural Change (Y3)	0.46	21.16%	3.99*	Significant
Social Empowerment (Y2)	>	Food Stability Level (Y4)	-0.244	0.208	1.18	Insignificant
Behavioral Change (Y3)	>		0.712	0.113	6.32*	Significant
Participation (Y1)	>		0.155	2.40%	0.92	Insignificant
Food Security Level (Y4)	>	Welfare (Z)	0.985	97.02%	606.83*	Significant

Based on Table 5 above, it shows the result of estimation and hypothesis testing. On Sub-Structure 1, the production factor (X1) has -0.664 for coefficient of line by CR value 0.88. Due to CR is lower than Critical Value (0.88 < 1.96), therefore the statistic hypothesis states that H0 is accepted, which means that the Production Factor (X1) has insignificant influence on participation (Y1) for about 44.09%, and the rest, 55.91%, is contribution besides the variable. However, the innovation variable (X2) has coefficient of line 0.639 by CR value for about 3.08. Due to CR is higher than Critical Value (3.08 > 1.96), therefore the statistic hypothesis states that H0 is rejected, which means that innovation (X2) has significant influence on participation (Y1) for about 40.83%, and the rest, 59.17%, is contribution besides the variable. Moreover, post harvest variable (X3) has 0.381 for coefficient of line by CR value for about 2.98. Due to CR is higher than the Critical Value (2.98 > 1.96), the statistic hypothesis states that H0 is rejected, which means that post harvest (X3) has significant influence on Participation (Y1) for about 14.52%, and the rest, 85.48%, is contribution besides the variable. Furthermore, the marketing variable (X4) has 0.659 for coefficient of line by CR value for about 1.18. Due to CR is lower than the Critical Value (1.18 < 1.96), the statistic hypothesis states that H0 is accepted, which means that marketing (X4) has insignificant influence on Participation (Y1) for about 43.43%, and the rest, 56.57%, is contribution besides the variable.

On Sub-Structure 2, participation variable (Y1) has 0.993 for coefficient of line by CR value for about 3.44. Due to CR is higher than the Critical Value (3.44 > 1.96), the statistic hypothesis states that H0 is rejected, which means that participation (Y1) has significant influence on social empowerment process (Y2) for about 98.6%, and the rest, 1.4%, is contribution besides the variable. Moreover, the production variable (X1) has 0.724 for coefficient of line by CR value for about 0.94. Due to CR is lower than the Critical Value

(0.94 < 1.96), the statistic hypothesis states that H0 is accepted, which means that production (X1) has significant influence on social empowerment process (Y2) for about 52.42%, and the rest, 47.58%, is contribution besides the variable. The innovation variable (X2) has -0.224 for coefficient of line by CR value for about 0.65. Due to CR is lower than Critical Value (0.65 < 1.96), therefore the statistic hypothesis states that H0 is accepted, which means that the Innovation (X2) has insignificant influence on social empowerment process (Y2) for about 5.02%, and the rest, 94.98%, is contribution besides the variable. Furthermore, post harvest variable (X3) has -0.515 for coefficient of line by CR value is for about 1.6. Due to CR is lower than Critical Value (1.6 < 1.96), therefore the statistic hypothesis states that H0 is accepted, which means that Post Harvest (X3) has insignificant influence on social empowerment process (Y2) for about 26.52%, and the rest, 73.48%, is contribution besides the variable. Meanwhile, marketing variable (X4) has -0.527 for coefficient of line by CR value 1.01. Due to CR is lower than Critical Value (1.01 < 1.96), therefore the statistic hypothesis states that H0 is accepted, which means that Marketing (X4) has insignificant influence on social empowerment process (Y2) for about 27.77%, and the rest, 72.23%, is contribution besides the variable.

On Sub-Structure 3, social empowerment process variable (Y2) has 0.46 for coefficient of line by CR value for about 3.99. Due to CR is higher than the Critical Value (3.99 > 1.96), the statistic hypothesis states that H0 is rejected, which means that social empowerment process (Y2) has significant influence on behavioral changes (Y3) for about 98.6%, and the rest, 1.4%, is contribution besides the variable. Moreover, the production variable (X1) has 0.724 for coefficient of line by CR value for about 0.94. Due to CR is lower than the Critical Value (0.94 < 1.96), the statistic hypothesis states that H0 is accepted, which means that production (X1) has significant influence on social empowerment process (Y2) for about 21.16%, and the rest, 78.84%, is contribution besides the variable. On Sub-Structure 4, social empowerment process variable (Y2) has -0.244 for coefficient of line by CR value for about 1.18. Due to CR is lower than the Critical Value (1.18 < 1.96), the statistic hypothesis states that H0 is accepted, which means that social empowerment process (Y2) has insignificant influence on Food Security Level (Y4) for about 5.95, and the rest, 94.05%, is contribution besides the variable. Furthermore, behavioral changes variable (Y3) has 0.712 for coefficient of line by CR value for about 6.32. Due to CR is higher than the Critical Value (6.32 > 1.96), the statistic hypothesis states that H0 is rejected, which means that behavioral changes (Y3) has significant influence on Food Security (Y4) for about 50.69%, and the rest, 49.31%, is contribution besides the variable. Meanwhile, participation variable (Y1) has 0.155 for coefficient of line by CR value for about 0.92. Due to CR is lower than the Critical Value (0.92 < 1.96), the statistic hypothesis states that H0 is accepted, which means that participation (Y1) has insignificant influence on Food Security Level (Y4) for about 2.4%, and the rest, 97.6%, is contribution besides the variable.

On Sub-Structure 5, Food Security variable (Y4) has 0.985 for coefficient of line by CR value for about 606.83. Due to CR is higher than the Critical Value (606.83 < 1.96), the statistic hypothesis states that H0 is rejected, which means that Food Security (Y4) has significant influence on welfare (Z) for about 97.02%, and the rest, 2.98%, is contribution besides the variable. An indicator of social welfare is Food Security at the household, by finding out ratio between total production of the farming and consumption of the household, which is equalized with rice (Burhanudin, 2012)
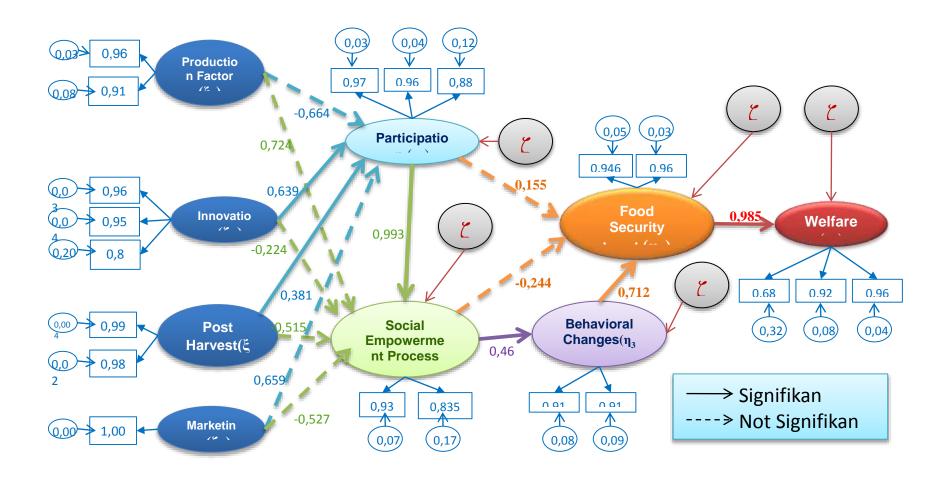
Figure 1. Diagram of Measurement Model and Structural Model

After finding out factors that have significant and insignificant influences on endogenous variables of each sub-structure, it can be found out that the insignificant variable would directly have significant influence through mediation variable. Therefore, the calculation result of indirect influence between variables is presented.

Table 6. Indirect Influence between Latent Variables

Indirect Influence	Calculation	Result	%	Description
Innovation (X2) toward Social Empowerment Process (Y2) through Participation (Y1)	0.639 x 0.993	0.635	63.5%	Significant
Post harvest (X3) toward Social Empowerment Process (Y2) through Participation (Y1)	0.381 x 0.993	0.378	37.8%	Significant
Social Empowerment Process (Y2) toward Food Security Level (Y4) through Behavior Changes (Y3)	0.46 x 0.712	0.328	32.8%	Significant

Table 6 above presents indirect influence between latent variables. The influence of innovation (X2) on social empowerment process (Y2) through participation (Y1) is about 63.5%, the influence of post harvest (X3) on the social empowerment process (Y2) through participation (Y1) is about 37.8%, and the social empowerment process (Y2) on Food Security Level (Y4) through behavioral changes (Y3) is about 32.8%.

Result of the research showed that welfare in relation to fulfilling the basic requirements, in which one of them is food. Sunarti (2006) stated that family's welfare has paralleled to the family's food sustainability. In Food Security concept, a household should be able to access sufficient foods in order to support life of the family's members, maximize earning has not guaranteed the fulfillment of such Food Security due to uneven distribution has become one of obstacles in bringing the Food Security into reality.

In bringing the Food Security into reality, the agricultural sectors should be concerned by increasing productivity, such as using optimal production factors, developing the farmers' capacities through empowerment, innovation or technological support, and policies, which are oriented to achieve the Food Security comprehensively (Prihatin *et al.*, 2012)

The farmer's participation in social empowerment process has affected the achievement of food sustainability. Participation is an integral part of the social empowerment because, without participation into the program, the empowerment process would not run well (Onyenemezu, 2014). Principles of participation suggest that farmers should provide the required stimulus for the success of Food Security program (Abiona, 2013). The farmers are willing to participate if they have opportunity, willingness, and ability. Strong will to change is supported by sufficient and appropriate innovation. Mardikunto (1988) stated that innovation is an idea, behavior, new practices and information product, which are accepted and applied to support the changes in all aspects of social life. According to Kustiyah (2011), innovation could not immediately be accepted by the public if it is considered no beneficial.

CONCLUSION AND SUGGESTION

Conclusion

Alternative for Food Security model of the farmer's household through social empowerment in Tarakan can be described broadly that welfare (Z) is affected by Food Security Level (Y4), in which the Food Security Level (Y4) is dominantly affected by the behavioral changes (Y3), while the social empowerment process (Y2) has directly insignificant in affecting the Food Security (Y4), but it would have significant influence if it is through behavioural changes variable (Y3). Besides that, participation (Y1) has directly insignificant influence on Food Security (Y4), however, it would have significant influence if it is through social empowerment process (Y2) and behavioural changes (Y3). The social empowerment process (Y2) is dominated by the influence of participation (Y1), in which participation (Y1) is dominated by the influence of innovation (X2) and post harvest (X3).

Suggestion

1. The empowerment process should be optimized, particularly in extension and assistance activities in order to encourage the farmers to be empowered to achieve food stability in Tarakan.
2. It requires cooperation among government, social self-supporting institution, community and the related parties in order to bring the food stability into reality in Tarakan.

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