

Development Strategy of Food Crop Agriculture Sub-sector In Improving Farmers' Welfare

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Abstract

This study aims to describe the priority strategy of agricultural sub-sector development in improving farmers' welfare. The data used in this study were primary and secondary data. Secondary data included: GRDP of Sumbawa District, GRDP of NTB Province, and other supporting data for this study. Primary data were: Experts Opinion Questionnaire or experts related to research problems. Respondents of this study were: bureaucrat respondents, academic respondents, farmer group respondents, and businessmen respondents. The determination of respondents used was purposive sampling technique which consisted of 30 respondents. The data analysis used was Process Hierarchy Analysis (AHP). The results of the study showed that: (1) Central government policies were a priority for achieving goals, compared to regional government policies. (2) Related to central government policy factor, protecting farmers was a priority compared to empowering farmers. (3) Regarding to protecting farmers, optimizing the role of Indonesia Logistics Bureau (BULOG) and implementing Warehouse Receipts was a priority. (4) Regarding the empowerment of farmers, the development of systems and facilities for marketing agricultural products was a priority. (5) The results of AHP showed that central government policies need to be considered and prioritized in crop agricultural sub-sector development strategy to improve farmers' welfare. Then to achieve the welfare of sub-criteria farmers, the protection of farmers must be prioritized. Furthermore, the alternative main priority in determining the strategy was optimizing the role of Indonesia Logistics Bureau (Bulog) and implementing Warehouse receipts.

Keywords: Strategy, Farmers, Welfare, *Analytical Hierarchy Process (AHP)*.

INTRODUCTION

Agriculture is the main characteristic of the village economy in Sumbawa. The rice field agricultural sector is the most feed its communities. Farmers are the largest segment in rural areas in Sumbawa, they get income from farming and also the most important food source. Farmers as the most agricultural output and most dominant must to be basis of regional food producers. Farmer productivity is one

measure of the rural economic development success (Syafuruddin et al, 2020). It caused in the last several periods in the 2016-2020 period that agricultural, forestry and fisheries sectors consistently become the base sector with the highest value, namely an average Location Quotation (LQ) of 1.787 compared to other basic sectors (the Electricity and Gas Procurement sector), Construction sector, Wholesale and Retail trade sector, Car and Motorcycle Repair, Financial Services and Insurance sector, Corporate Services sector, Government Administration, Treaty and Compulsory Social Security sector, and Education Services sector). It means that these sectors were the dominant base sector that supports Sumbawa's economy.

As one of the sub-sectors in the basic sector of the Sumbawa economy, it should that agricultural sub-sector should be prioritized in regional economic development through improving farmers' welfare program. (Todaro, 2006) explains that agricultural development can increase populations' welfare, can increase income and living standard of farmers, can expand employment and business opportunities, support development and increase exports. An economic development energy that is prioritized on agriculture-based and employment requires at least 3 basic complementary elements, namely: (1). Accelerating output growth through a series of technology adaptation, institutional and price-intensive adjustments specifically designed to increase farmers' productivity; (2). The increasing of domestic demand on agricultural output that based on urban development strategy that was oriented on employment empowerment. (3). Diversification of rural development activities on non-agricultural works which directly and indirectly would support and would be supported by the agricultural communities. Kuncoro, (2004) states that in determining development policies and regional economy sector development, it should be prioritized superior sub-sectors owned by each district/city.

Even though the agricultural sector has consistently been the basis of Sumbawa's economy, but farmers in Sumbawa still face various problems. Syafuruddin et al (2020) stated that farmers in Sumbawa regarding to cooperative relationship with related parties are still lack that proven by information networks and work networks that are still only to fellow members of farmer groups. It became problems in implementing advanced farming system such as diversifying farming system become modern/commercial farming system. In addition, the inability to form strong and consistent network made farmers in Sumbawa trapped in subsistence farming system so that the bargaining value of farm production was still low. Besides, the problem that still needs to be solved was that currently farmers as the smallest agribusiness unit had not been able to achieve rational added value according to integrated farming scale (integrated farming system). It was also based on the field fact showed that the higher the level of education of person they tends to leave farming work and they prefer to work in the service and industrial sectors in the city. Therefore, building institutions in farming communities become more important, so that rice field farmers in rural areas are able to do activities that do not only focus on farm business but also focus on off-farm agribusiness aspects. Furthermore, based on field observations, the other problems faced by farmers in Sumbawa were expensive production costs namely land processing costs, labor costs, pharmaceutical costs, and fertilizer costs. Not only production costs, the most crucial problem currently faced by farmers in

Sumbawa was price fluctuations that caused the price of agricultural products become cheaper and also the difficulty in marketing (finding buyers) of these products. It had impact on decreasing the welfare of farmers.

The problems of farmers in Sumbawa were similar as those in Indonesia. Yudiarini et al., (2014) stated that the problems that were still faced by farmers and farmers institutions in Indonesia were: (1) there were still lack of insight and knowledge of farmers on production management issues and marketing networks, 2) farmers were not fully involved in agribusiness activities, they were still focused only in production activities, 3) farmer institutions did not operate optimally yet. N. Nuswardani, (2019) also states that agriculture in Indonesia was faced with low levels of farmers' welfare, problems of capital, access to financing institutions, market access, competitiveness, legal and social power, environmental sustainability. Agriculture also faces the risk of uncertainty of natural resource competition, natural sustainability, and industry demand uncertainty. The government, in this case was also as stakeholder in Indonesian agriculture with industry, traders, cooperatives, associations, farmer groups, and financial institutions (Nuraini, 2019). Increasing the welfare of farmers was also a target to be achieved (Watemin & Budiningsih, 2015). Based on the problems faced by farmers in Sumbawa, there must be special strategy that should be done so that those problems can be solved and the agricultural sector will truly benefit for economy and can improve farmers' welfare. The formulation strategy according to several previous studies can be done through various methods such as location quotient (LQ), SWOT analysis and Analytical Hierarchy Process (AHP). However, most of the previous studies indicated that the AHP method was more widely used to achieve the objectives of this study, namely to know priority strategy of crops agricultural sub-sector development in improving farmers' welfare in Sumbawa

METHOD

The type of this study was descriptive study. Descriptive study according to Sugiyono (2016) is a method in study human group status, a subject, a set of conditions, a system of thought or events class in the present. Descriptive study aims to describe precisely something that is happening in the time of study. In this study, it were not just explaining the event (problem) but also describing how the event (problem) could occur. The findings in descriptive study are broader and more detailed compared in explorative study. The descriptive method in this study aims to make description or systematic description of the phenomenon being investigated, namely the problem of low of farmers' welfare and tried to know strategies for developing the food crop agriculture sub-sector in order to improve the farmers' welfare in Sumbawa.

Type and source of data

The data used in this study were primary and secondary data. Primary data is a source of data obtained directly from the original source (not through intermediaries). Primary data in this study were obtained through interviews and questionnaires. The sources of primary data in this study were experts whom understood the object of study and they were selected appropriately so that they could provide information related to the object of the study.

Population and sample

Population is generalization area consisting of objects/subjects that would be studied and then drawing conclusions with characteristics and certain quantities (Sugiyono, 2016). The populations in this study were individuals whom had knowledge and experience development of food crop agriculture subsector in Sumbawa District, in which the population were divided into four parts, with the following criteria:

1. Bureaucrat respondents were respondents (individuals) from government agencies/government institution in Sumbawa District, as experts whom understand problems related to agriculture, especially the food crops sub-sector in Sumbawa District.
2. Academic respondents were respondents whom work/were involved in university institutions and experts whom understand agricultural problems, especially food crops sub-sector in Sumbawa District.
3. Farmers/Farmers Groups respondents were respondents whom work/were involved directly in agricultural activities, especially those whom understand agricultural problems, especially the food crops sub-sector, Sumbawa District.
4. Entrepreneur respondents were respondents whom were engaged in business of agricultural food crops processing in Sumbawa District

The samples in this study were bureaucrat respondents, academic respondents, farmer group respondents, and entrepreneur respondents that previously had determined and fulfilling criteria as object of study namely sampling method using purposive sampling technique. Purposive sampling is a sampling technique based on certain characteristics that have close affinity with characteristic of population previously known which have determined with certain criteria that have determined based on study objectives. It were done to determine bureaucrat respondents, academic respondents, and farmer group respondents whom were be selected based on predetermined criteria and needed to re-clarify its feasibility with certain procedures. The numbers of samples in this study were 30 expert respondents from bureaucrats, academics, and group farmer

Method to collect data

The method used to collect data in this study were done through questionnaire and interviews

1. Questionnaire
(Sugiyono, 2016) defines questionnaire as data collection technique that done through giving a set of questions or written statements to respondents to answer. The questionnaire used by researchers as research instrument in this study was closed questionnaire. The questionnaires used in this study were to obtain data on food crop agriculture sub-sector and to determine its development strategy.
2. Interview
According to (Sugiyono, 2016), interview is meeting of two people to exchange information and ideas through question and answer, so that can be constructed its meaning in a particular topic. Interviews was done in preliminary study to know problems that had to be studied, and to know

information related to strategy to develop food crop agriculture subsector in improving farmers' strategy.

Data analysis technique

The data analysis technique used in this study was Analytical Hierarchy Process (AHP). AHP in this study was used to know the strategy of food crop agriculture sub-sector in improving farmers' welfare. AHP is a decision support model developed by Thomas L. Saaty. The supporting model of this decision will describe complex multi-factor or complex multi-criteria into a hierarchy, according to Saaty, (1993), hierarchy is defined as a representation of complex problem in multi-level structure where the first level is the objective, followed by the factors, criteria, sub criteria, and so on down to the last level namely alternative. With hierarchy, a complex problem can be broken down into its groups and then be arranged become hierarchical form so that the problem will more structured and systematic. The characteristic of AHP model solving is using a hierarchy that breaks down complex problems become simpler elements. The hierarchy of this method can be divided into objectives, criteria and alternatives. In this study, the hierarchy used in determining the best strategy was the hierarchy shown in Figure 1.

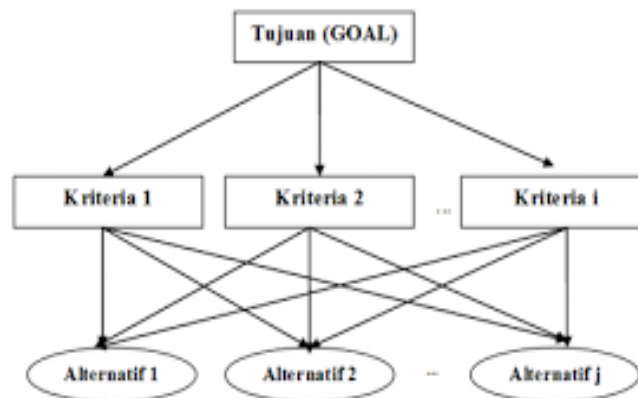


Figure 1. Drawing of AHP Model Hierarchy. Sumber : Saaty, 1993

Based on Figure 1 above, it can be explained that there were two groups of variables used in AHP in this study. First was the Criteria variable group, namely: Central Government Policy & Regional Government Policy. The sub-criteria refer to the Law of the Republic of Indonesia Number 19 of 2013 concerning the Protection and Empowerment of Farmers. The criteria of AHP model in this study consisted of two sub-criteria, namely farmers' protection and farmers' empowerment. Second was the Alternative Strategy variable group. Alternative strategies consisted of: increasing the procurement of production equipment and infrastructure, Increasing partnerships with investors or capital owners, Optimizing the role of Indonesia Logistic Bureau (Bulog) and implementing Warehouse Receipts, Developing systems and agricultural products marketing, facilitating of science, technology and information access, Strengthening farmer groups as an institution collective. All mentioned above will be scored based on two criteria of AHP model in this study. Farmer Protection is all activities to help farmers in facing problems related to difficulties in getting infrastructure and

production facilities, business certainty, price risk, crop failure, expensive-cost economic practices, and climate change. Farmer Empowerment is all activities to increase the ability of farmers to do better farming business through education and training, counseling and mentoring, systems development and marketing Agricultural products facilities, consolidation and agricultural land area guarantee, the easy of knowledge, technology and information access, and farmer institutional strengthening.

RESULTS AND DISCUSSION

Description of respondents

This study conducted by involving 30 respondents, consisted of bureaucrats, academics, farmer/Farmer Groups, and entrepreneurs. The following were description of respondents:

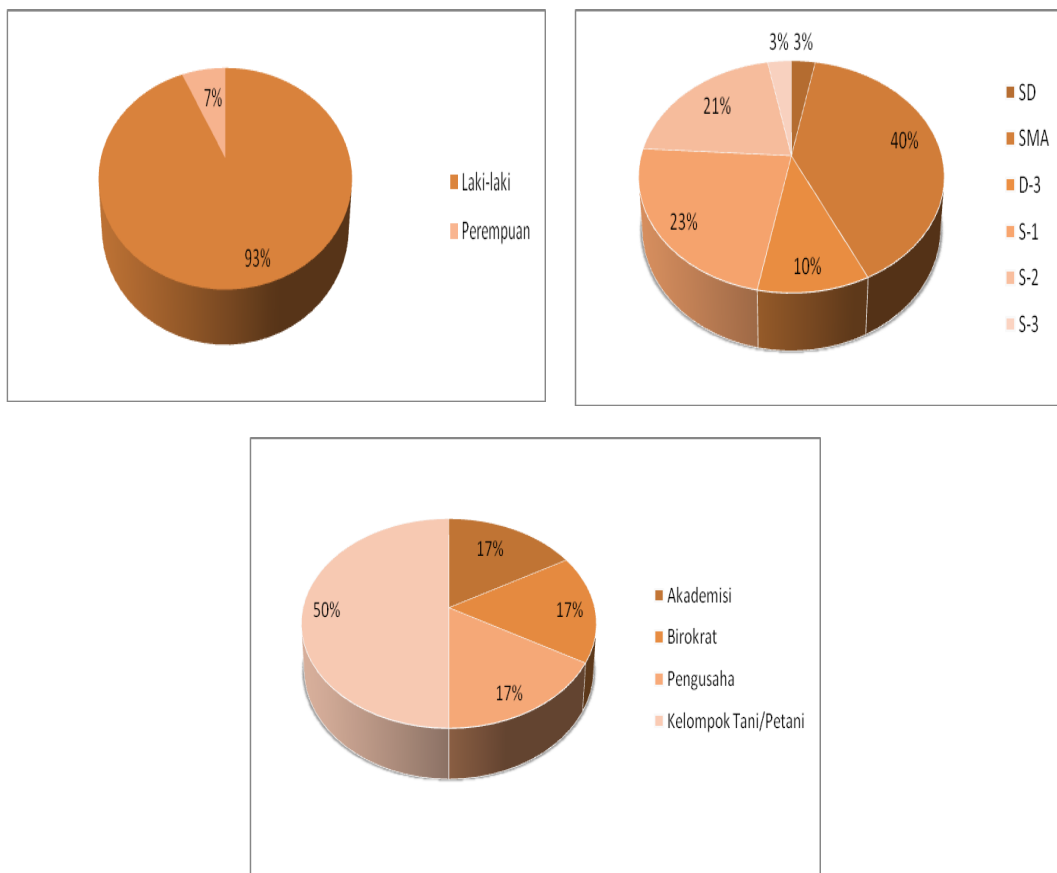


Figure 2. The data of respondents based on sex, education degree and profession.
Source: primary data, processed, 2022

Based on Figure 2 above it can be explained that the number of respondents in this study based on gender namely: the number of male respondents in this study were 28 respondents or 93%, while the number of female respondents were 3 respondents or 7%. Meanwhile, based on education degree it can be explained that the number of respondents with elementary school was 1 respondent or 3%, the number of respondents with senior high school were 12 respondents or 40%, then the number of respondents with Diploma-3 (D-3)

were 3 respondents or 10%, then the number of respondents with undergraduate degree (S-1) were 7 respondents or 23%, the number of respondents with Magister degree (S- 2) were 6 respondents or 20%, then the number of respondents with Doctoral degree (S-3) was 1 respondent or 3%. Furthermore, based on the type of profession, the numbers of bureaucrat respondents were five respondents or 17%, the number of Academic respondents were 5 respondents or 17%, the number of Entrepreneurs respondents were 5 respondents or 17%, and the number of Farmers/Farmers Group respondents were 15 respondents or 50%.

The result of analytical hierarchy process (AHP)

AHP is a method that can be used for decision making with several objectives or criteria to choose certain decisions. AHP was developed by Thomas L. Saaty, this method has decision-making techniques that observe at qualitative and quantitative aspects that can be used as decision makers, the factors considered in the AHP method are perception, preference, experience and intuition. In this study, the Analytical Hierarchy Process (AHP) method was used by researchers to determine strategy of developing food crop agriculture subsector in improving farmers' welfare through criteria, sub-criteria and alternative criteria. The criteria in this study were: Central Government Policy and Regional Government Policy. The first level was to determine the level of importance of each criterion

Table 1. The result of AHP criterion score

No	Criteria	Priority Vector
1.	Central Government Policy	0,504
2.	Regional Government Policy	0,496
Consistency Ratio (CR)		0,000

Source: primary data, processed, 2022

Based on the table and above calculation, the criteria that had the highest priority vector was Central Government Policies with priority vector of 0.504 (50.40%), then Regional Government Policies with priority vector of 0.496 (49.60%). Based on the above table to determine the most important criteria to use was central government policy with value of 50.40%, then regional government policy with value of 49.60%. These results indicated that central government policies was a priority for achieving goals, because the results of data analysis using AHP showed that it had higher importance compared to regional government policies. Next was determining the importance level among each of sub-criteria namely: Farmers protection and Farmer empowerment. Determination of importance level of the sub-criteria had correlation to central government policy factors.

Table 2. The result of sub-criteria value of central government policy factor

No	Criteria	Priority Vector
1.	Farmers' protection	0,716
2.	Farmers empowerment	0,284
Consistency Ratio (CR)		0,000

Source: primary data, processed, 2022

Based on the table and above calculation result, the sub-criteria that had the highest priority vector was farmer protection with priority vector of 0.716 (71.60%), then farmer empowerment with priority vector of 0.284 (28.40%). Based on the above table to determine the most important sub-criteria to be used related to central government policy factors was farmers protection with value of 71.60%, then farmers empowerment with value of 28.40%. These results showed that regarding to central government policy factors related to farmers' protection was became priority to be achieved, because based on the results of data analysis using AHP showed that farmer protection had higher important level compared to farmer empowerment. The next step was determining the importance level of each sub-criterion namely: farmers Protection and farmers Empowerment. The Determining of importance level was correlated to regional government policy factors.

Table 3. The result calculation of sub-criteria of regional government factor value

No	Criteria	Priority Vector
1.	Farmers protection	0,591
2.	Farmers empowerment	0,409
Consistency Ratio (CR)		0,000

Source: primary data, processed, 2022

Based on the table and above calculation results, the sub-criteria that had the highest priority vector was farmer Protection with priority vector value of 0.591 (59.10%), then farmer empowerment with priority vector of 0.409 (40.90%). Based on the above table to determine the most important sub-criteria to be used related to regional government policy factors was farmers protection with value of 59.10%, then farmers empowerment with value of 40.90%. These results indicated that related to regional government policy factors regarding to farmers protection was became priority to be achieved because the results of data analysis using AHP showed that farmer protection had higher importance level compared to farmer empowerment.

Table 4. The result calculation of farmer protection alternative criteria value

No	Criteria	Priority Vector
1.	Increasing equipment procurement and production infrastructure	0,219
2.	Increasing partnership with investor or capital owners	0,227
3.	Optimizing the role of Indonesia Statistics Bureau (Bulog) and implementing Warehouse Receipts	0, 269
4.	Developing systems and facilities of marketing agricultural product	0,119
5.	The easier of science, technology and information access	0,070
6.	Institutional strengthening of farmer groups collectively	0, 097
Consistency Ratio (CR)		0,003

Source: Primary data, processed, 2022

The next steps was determining the importance level of each alternative criterion in farmer protection namely: Increasing equipment procurement and production infrastructure, Increasing partnerships with investors or capital owners, optimizing the role of Indonesia Statistics Bureau (Bulog) and implementing warehouse receipts, developing agricultural products marketing systems and

facilities, the easier of science, technology and information access, institutional strengthening of farmer groups collectively. The determinations of these alternative criteria importance level were correlated to farmer protection.

Based on the table and above calculation results, the alternative criteria that had the highest priority vector were Optimizing the role of Bulog and implementing Warehouse Receipts with priority vector of 0.269 (26.90%), Improving partnerships with investors or capital owners with priority vector of 0.227 (22.70%), Increasing equipment procurement and production infrastructure with priority vector of 0.219 (21.90%), developing systems and facilities of marketing agricultural product with priority vector of 0.119 (11.90%), Strengthening farmer groups collectively with priority vector of 0.097 (9.70%), the easier of science, technology and information access with priority vector of 0.070 (7.00%).

Based on the above table to determine the most important alternative criteria to be used related to farmer protection were optimizing the role of Bulog and implementing Warehouse Receipts with value of 26.90%. Increasing partnerships with investors or capital owners with value of 22.70%, Increasing equipment procurement and infrastructure production with value of 21.90%, developing systems and facilities of marketing agricultural product with value of 11.90%, strengthening collective farmer group institutions with value of 9.70, the easier of science, technology and information access with value of 7.00%. These results indicated that related to farmer protection, optimizing the role of Bulog and implementing Warehouse Receipts were became priority to be achieved because the results of data analysis using AHP showed that it had higher importance level compared to other alternative criteria.

The next steps was determine the importance level of each Alternative Criterion in farmer empowerment namely: Increasing procurement of equipment and infrastructure production, Increasing partnerships with investors or capital owners, optimizing the role of Bulog and implementing Warehouse Receipts, developing systems and facilities of marketing agricultural product, the easier of science, technology and information access, institutional strengthening of farmer groups collectively. The determination of these importance levels was correlated to farmer empowerment.

Table 5. The result calculation of farmer empowerment alternative criteria value

No	Criteria	Priority Vector
1.	Increasing equipment procurement and infrastructure production	0,099
2.	Increasing partnership with investor or capital owners	0,106
3.	Optimizing the role of Bulog and implementing Warehouse Receipts	0,092
4.	Developing systems and facilities of marketing agricultural product	0,369
5.	The easier of science, technology and information access	0,128
6.	Institutional strengthening of farmer groups collectively	0,204
Consistency Ratio (CR)		0,007

Source: primary data, processed, 2022

Based on the table and above calculation results, it is known that the priority vector of each alternative criterion namely: increasing equipment procurement and infrastructure production with priority vector of 0.099 (9.90%), increasing partnerships with investors or capital owners with priority vector of

0.106 (10, 60%), Optimizing the role of Bulog and implementing Warehouse Receipts with priority vector of 0.092 (9.20%), developing systems and facilities of marketing agricultural product with priority vector of 0.369 (36.90%), the easier of science, technology and information access with priority vector of 0.128 (12.80%), institutional strengthening of farmer groups collectively with priority vector of 0.204 (20.40%).

Based on the above table, to determine the most important alternative criteria to be used related to farmer empowerment were developing systems and facilities of marketing agricultural product with value of 36.90%, Institutional strengthening of farmer groups collectively with value of 20.40%, the easier science, technology and information access with value of 12.80%, Increasing partnerships with investors or capital owners with value of 10.60%, Optimizing the role of Bulog and implementing Warehouse Receipts with value of 9.90%, Increasing equipment procurement and production infrastructure with value of 9.20%. These results indicated that related to farmer empowerment, developing systems and facilities of marketing agricultural product was priority to be achieved because the results of data analysis using AHP showed it had higher importance level compared to other alternative criteria.

The next steps were determination strategic priorities of the problems discussed in this study, were: goals or strategy of agricultural sub-sector development in improving farmers' welfare by using 2 criteria namely: Central Government Policy and Regional Government Policy, using 2 sub-criteria namely: farmer protection and farmer empowerment, and Alternative Criteria namely: Increasing equipment procurement and production infrastructure, Increasing partnerships with investors or capital owners, Optimizing the role of Bulog and implementing Warehouse Receipts, developing systems and facilities of marketing agricultural product, the easier of science, technology and information access, institutional strengthening of farmer group collectively. The determination of these alternative importance criterion levels were correlated to farmer empowerment.

Table 6. Results Calculation of Alternative Priority Criteria Strategy Development of the Food Crops Agriculture Sub-sector in Improving Farmers' Welfare

No	Criteria	Priority Vector
1.	Optimizing the role of Bulog and implementing Warehouse Receipts	0,220
2.	Increasing partnership with investors or capital owner	0,193
3.	Developing systems and facilities of marketing agricultural product	0,188
4.	Increasing equipment procurement and infrastructure production	0,186
5.	Institutional strengthening of farmer group collectively	0,127
6.	The easier of science, technology and information access	0,086
Consistency Ratio (CR)		0,000

Source: primary data, processed, 2022

Based on the above table to determine the most important alternative criteria to be used related to the strategy of agricultural sub-sector development in improving farmers' welfare, the criteria that had the highest priority vector as follows: 1). Optimizing the role of Bulog and implementing Warehouse Receipts with priority vector value of 0.220 (22.00%); 2). Increasing partnerships with investors or capital owners with priority vector value of 0.193 (19.30%), 3). Developing systems and facilities of marketing agricultural product with priority

vector value of 0.188 (18.80%), 4). Increasing equipment procurement and infrastructure production with priority vector value of 0.186 (18.60%); 5). Institutional strengthening of farmer group collectively with priority vector value of 0.127 (12.70%); 6), the easier of science, technology and information access with priority vector value of 0.086 (8.60%). These results indicated that related to the strategy of agricultural sub-sector development in improving farmers' welfare, Optimizing the role of Bulog and implementing Warehouse Receipts were became the priority to be achieved because the results of data analysis using AHP showed that it had higher importance level compared to other alternative criteria.

Discussion

Based on the results of data analysis showed that the strategy of agricultural sub-sector development in improving farmers' welfare were: 1). Optimizing the role of Bulog and implementing Warehouse Receipts; 2). Increasing partnerships with investors or capital owners; 3). Developing systems and facilities of marketing agricultural product, 4). Increasing the procurement of production equipment and infrastructure; 5). Institutional strengthening of farmer groups collectively; 6). The easier of science, technology and information access.

Optimizing the role of Bulog and implementing Warehouse Receipts

Common phenomenon that occurs in agricultural commodity trading is the price drop during harvest and soaring prices during famine. Price stabilization policy for grain and rice, which involves the active role of PERUM BULOG as a policy holder related to grain and rice is much needed. The role of PERUM BULOG are to maintain price stability and distribution of food ingredients, especially rice as social commodity that can affect economy, politics, and even defense and security. To realize their role, several steps that can be done by PERUM BULOG are as follows:

1. PERUM BULOG must make understandings, agreements and commitments with central government, provincial governments, regional governments and with partners (examples agricultural entrepreneurs or companies, bank and non-bank financial institutions, village owned enterprise/BUMDesa) especially related to guarantees for purchasing of agricultural products, ensuring price stability, and availability of basic commodities, because the challenges faced by farmers were the absence of guarantees for purchasing of agricultural product, so that the price of agricultural products becomes less optimal or cheap during the harvest season.
2. PERUM BULOG must become supplier of quality rice for the needs of the TNI, POLRI, and state civil apparatus. It is in line with Budi Waseso's opinion as quoted by Wibowo, (2021) that BULOG must return to produce premium rice with the best quality for the TNI, Polri and state civil apparatus in Indonesia. This step has been done where several national bank have made PERUM BULOG as supplier of rice for their employees regularly. Thus BULOG will have clear market share so that farmers' uptake rice can be maintained.
3. PERUM BULOG must be able to produce its own premium quality rice with medium prices. To realize it, PERUM BULOG must have modern rice milling plant (RMP) and must be completed with other supporting facilities and

infrastructure (warehouses, dryers, etc.) in areas where rice is produced. So far, PERUM BULOG buys the majority of rice from third parties. It makes the shape and quality of rice in PERUM BULOG varies. The building of modern RMP in the rice production area can accommodate all farmers' crop in those areas and can be processed immediately. By existence of modern RMP and its supporting facilities and infrastructure, the quality of rice produced by PERUM BULOG will be better, but with lower cost because it can be milled by PERUM BULOG itself.

In addition, the existence of modern RMP and its supporting facilities and infrastructure will able to support the Warehouse Receipt System, which is an important and effective instrument in the trade financing system. The Warehouse Receipt System can facilitate granting credit to business world with inventory collateral or goods stored in warehouses. It is in line with what was argued by Nasution, (2017) that the distribution of agricultural product effectively and efficiently can be grand design strategy for improving performance of the agricultural sector which is characterized with farmers' welfare and also benefits for consumers.

Increasing partnerships with investors or capital owners

Partnership is a form of working relationship that occurs between two or more parties that have commitment to achieve goals by combining resources and coordinating joint activities. Partnerships can only be done if the involved parties had already have agreement. The concept of partnership itself contains a process of building trust, join problem solving and managing relationships among the parties involved in it (N. Nuswardani, 2019). Currently, partnership agribusiness investment is one of the investments that are in great demand by potential investors. It is because the commodity that done in partnership agribusiness investments is one of few industries whose its commodities are Indonesia's competitive advantage to compete at the global level (Nuraini, 2019). The number of partnership agribusiness investment is increasingly expansive and widespread every year. In general in every investment activity, land is the most important asset and the most vital production tool. Thus, it can be ascertained that in every investment activity in various sectors, land conflicts rank at the top (Marita et al., 2021).

The partnership system in the agricultural sector has been proven able to increase communities' income. The partnership system in the agricultural sector is very important to increase communities' income, thereby it can mobilize rural resources to produce competitive products. Some of the partnership strategies that can be done as follows:

1. *Public Private Partnership* (PPP) is a cooperation mechanism that done by the government and private sector by sharing resources, knowledge, and risks in order to increase efficiency of product, distribution of products and services so that it can produce various benefits (Pasaribu, 2016). But Public in the context of farmer partnerships can mean that farming communities supported by government jointly work together or partner in balanced position and mutual respectful with the private sector to produce useful thing for each party. Pasaribu, (2016) stated that cooperation system for productive activities in form of partnerships (public-private partnership or PPP) in agricultural sector

is very important as an alternative program in order to increase communities' income.

2. PPP is a policy instrument that able to mobilize rural resources to produce competitive products. The implementation of this PPP can be in the form of farmer partnership with large companies (examples companies or entrepreneurs in the agricultural sector, bank and non-bank financial institutions, advanced village owned enterprise). Through this partnership, farmers do cultivation activities, while industry and large companies do processing and marketing. Sari et al., (2017) through the results of his study revealed that the formation of partnership agribusiness entities would easily occur, because the average income of pre-plasma farmers was lower than the expected income of post-plasma farmers. In addition, the average communities' response in the formation of agribusiness partnerships belongs to the agreed criteria, it means that partnership agribusiness investments will be easy to happen.
3. Form cooperative agricultural-based. Sugiyanto (2022) explains that cooperatives can be used as an option to do agricultural business corporate programs, at least it was like during the glorious era of Village Unit cooperatives (KUD). These cooperatives are endeavored at least to economies scale, market-oriented, regional-based and managed professionally. The results showed that there were benefits that can be gotten by its members, such as market certainty and price, availability of inputs needed by breeders, can minimize risks (insurance, etc.). Of course, to achieve all of the partnership systems mentioned above, the role of the government is very important, especially as the initiator and mediator of the partnership. For partnerships with this agricultural cooperatives system, the Government has been launched corporate farming program through cooperatives, regulation of Agriculture Minister No. 18 of 2018 states that farmer economic institutions are legally incorporated in form of cooperatives or other legal entities with most of the capital ownership are by farmers. It means that individual farmers or through conventional groups, farmer groups (poktan) but still not yet economic scale can form cooperatives in order that business economies scale can be achieved, market-oriented, area-based and be done with reliable business management.

System development and facilities of agricultural product marketing

The current increasing agricultural production paradigm should be balanced with the existence of trading system revitalization or agricultural products marketing. Therefore the efforts to improve agricultural production marketing must be done to improve bargaining position value of farmers as producers of agricultural commodities. Some strategies that must be done are:

1. Local farmers can do cooperation among the farmers who have similar commodities. Cooperation can be like forming centers or warehouses managed by those the farmers group. The existence of these centers can make agricultural products marketing more efficient and make consumers can knows the existence of products and can facilitate the process of buying and selling in large quantities. Thus, farmers will become price makers in their agricultural products marketing and can determine their own prices at the consumer level.

2. Local farmers can also do cooperation among farmers by creating auction system to sell their products. The auction system will increase the selling price of the product because the marketing will be chosen based on the highest purchase price. Thus, the farmers will be easier to gain profits and be avoided from price manipulation done by middlemen or collectors so that the agricultural products marketing will be more efficient.
3. The Centre government makes policy by establishing a system or program that helps agricultural products marketing by involving various elements namely:
 - a) Regional government

The regional government acts as regulator that regulates system by issuing regulations that regulate: Institutional systems and information and technology systems model, Working Group that runs system, Restructuring Village Owned Enterprises (BUMD) to be Holding Company by establishment Subsidiaries: (a) Regional Owned Enterprises sector of Information and Technology (IT); (b) Regional Owned Enterprises sector of Agricultural Distribution Needs; (c) Regional Owned Enterprises sector of Agricultural Products Marketing; (d) Regional Owned Enterprises sector of Agricultural Financing; (e) Regional Owned Enterprises sector of Credit Financing Guarantee. The government also acts as controller on the activity of the system through Regional Owned Enterprises that is representative of government in implementation commercial and social system, and the Government acts as investor and supervisor of system implementation.
 - b) Supplier of Agricultural Production Facilities and Technology

Suppliers have duties to supply agricultural production facilities and supporting tools (supporting technology). These suppliers consist of: Suppliers of fertilizers, Suppliers of seeds, Suppliers of medicines and Suppliers of agricultural machinery and other technologies needed.
 - c) Regional Owned Enterprises involved as system managers in which in its implementation is an extension of the Government to do mission and objectives of the system were built Consist of:
 - (1) Regional Owned Enterprises division of Information and Technology are the main license holders (Master Licensee) and responsible for information system and technology in programs or systems being built.
 - (2) Regional Owned Enterprises division of Agricultural Distribution Needs, are users of IT system that operate the institutional system. This Regional Owned Enterprise will cooperate with manufacturers, distributors, banking and village distributor. Then this Regional Owned Enterprise is also partner of farmers in ordering, purchasing, and distributing farmers' need.
 - (3) Regional Owned Enterprises division of Agricultural Products Marketing, are institutions that buy agricultural products.
 - (4) Regional Owned Enterprises division of Agricultural Financing correlated with Banking as partners of Communities Business Credit or other credit.
 - (5) Regional Owned Enterprises division of Credit Financing Guarantor has the role as guarantee partners of financing beside KUR. It financing is from banks and other investors. The investors invest their

capital to be distributed to agricultural financing. Agricultural financing is distributed through Regional Owned Enterprises (BUMD) as institution that coordinates farmers at the village level. In its implementation, the institution means is Microfinance Institution (LKM), which will later correlate with farmers.

- (6) Insurance Service Company, is agricultural insurance provider partner that act as guarantees if happen crop failure.
- d) Buyers/ Market, is partners of Regional Owned Enterprises (BUMD) that act as market of agricultural products that buy agricultural products.
- e) Banking has the role to distribute capital loans to farmers through Regional Owned Enterprises (BUMD) division of financing. Then it act as financial transaction support institution in the system or program
- f) Farmers as programs beneficiaries or systems that had been built. The benefits means are the availability and quality of agricultural production facilities, capital sources, agricultural technology, farming business coaching, and guaranteeing the agricultural products price by guaranteeing agricultural production.

Increasing equipment Procurement and Production Infrastructure

One the key to increase agricultural production and farmers' welfare is farming efficiency business. Therefore, one the strategy to achieve it is through development and improvement of modern agricultural machinery (alsintan) that is balance with human labor. Therefore, agricultural development will continue to empower farmers with advanced agricultural technology. Modern Alsintan will be useful to speed up tillage process, time planting, and harvesting so that it can cause time efficiency, power and agricultural production cost and it boost productivity and farmers' welfare. In addition, improvement of agricultural infrastructure also needs to be improved. It is done by repairing damaged irrigation canals, adding new irrigation canals, and building and maintaining dams to ensure the availability and supply of water for agriculture.

The Strengthening of farmer group institution collectively

Farmer groups are institutions at the farmer level that are formed to organize farmers directly in farming. The Ministry of Agriculture defines farmer group as a group of farmers/breeders/planters that formed on the basis of common interests, similar environmental conditions (social, economic, resource) and friendship to improve and develop members' businesses. Farmer groups are formed by and for farmers, in order to overcome common problems in farming and to strengthen the bargaining position of farmers both in infrastructure market and in agricultural products market.

The lack functioning of existing farmer groups are caused by the formation of institutional formation did not done in participatory, in which farmers as beneficiaries were acted as actors who run those institutions. The institutions were formed do not accommodate the potential and interests of farmers, which should be the point to do its collective action. In general, the existing of farmer groups are the result of project activities and several of those project were not do completely so that there are many farmer groups cannot maintain their groups or only have names left. However, there are also farmer groups that are progressing

even though there are no more projects or assistance received. Therefore, the activities to increase the capacity of farmer groups through a series of coaching are very important to be done to realize the independence of farmer groups and farmers' welfare (Hermanto, 2011). Currently it is quite difficult to find active farmer groups, where its members take advantage of these institutions to improve farming performance to improve farmers' welfare. Besides, the activity to strengthen farmer group institutions is not an easy even it need sufficient time and financial resources. However, institutional strengthening must be done to lead to the independence of farmer groups. Thus, the strategic policies needed to strengthen farmer groups were (Hermanto, 2011):

1. Create conducive climate within the farmer group environment, such as mutual trust, mutual support among members of farmer groups, among farmer groups, among farmer groups and their coaches so that the coaching on farmer groups are able to form and to develop farmer groups in participatory (of, by, and for farmers).
2. The fostering creativity and initiative of farmer group member to take advantage of every business opportunity, information and access of available capital. It can be done by increasing the ability of group farmer members to make changes through rational thinking, being open to new ideas, science and technology oriented, appreciating achievement, efficient, productive, having the calculation to act and having the courage to make decisions based on their own considerations and not fatalistic.
3. Help expedite the process of identifying needs and problems, make planning, and solve the problems encountered in farming business. For this reason, farmer groups need to be equipped with skills regarding the steps that must be done in identifying and solve the problems by utilizing accurate information sources.
4. Improve the ability in analyze market potential, business opportunities, analyze potential area and owned resources to develop cultivated commodities in order to provide greater business profits. It can be done by increasing farmer group access to information. Therefore, the development of information system through wider network urgently needed so that farmer groups can be more responsive to various changes in progress in agriculture.
5. Improving ability in order to able to manage commercial farming, sustainable and environmentally friendly. It can be done by fostering cooperation among members in farmer groups. The cooperation of each member involved can be directed so that they are able to interact to improve their capabilities and performance of their farming business sustainably
6. Improving the ability to analyze the business potential of each member to become a business unit that guarantees market demand either in quantity, quality and continuity. It can be done by doing guidance and support so that group members want to learn and try innovation.
7. Develop the ability to create specific local technologies. It can be done by encouraging competition from group farmer members to create specific local technologies. In this competition, farmer groups provide confidence to its members in practicing agricultural technology in accordance with their respective businesses.

8. Encourage and advocate so that farmers are willing and able to do savings and loan activities to facilitate business capital development. It can be done by encouraging, providing motivation and raising awareness to develop group capital. Besides, providing capital assistance in the form of credit to group members is also important to assist them in developing business capital by utilizing their skills to improve their income.

In implementing this strategy, it needs several operational steps namely:

- 1) Guide and encourage farmers to be able to cooperate in the economic field in groups. Group members must consist of farmers who have the same interests and mutual trust so that it will form harmonious cooperation. Guidance and facilitation assistance provided by the advisory agency or other party must be able to foster the independence of the farmer group.
- 2) fostering farmer groups through; (a) increasing facilitation and capital access for farmers in order to develop business scale, (b) increasing bargaining position through farmers consolidation in a farmer group forum to unite economic movements in groups in each supply chain from pre-production until marketing, (c) increasing facilitation and coaching to group organizations, and (d) increasing farming efficiency.
- 3) Increasing human resource capacity of farmers through various mentoring activities and training designed specifically for administrators and members, such as entrepreneurship courses, participatory management, achievement motivation development and apprenticeships/comparative studies. Increasing human resource capacity of farmers needs serious attention, especially development efforts that must be done integrated and comprehensive so that the existence of farmer organizations can improve farmers' welfare, not be used as a riding horse for the political interest, social and economic of certain parties.
- 4) In strengthen farmer group, technically is done by Field Agricultural Extension (PPL). Even so, assistance in developing farmer groups can also be done by NGOs and other organizations that are capable and experienced in doing community empowerment. In this case the task of coaching assistant are develop participation, attitude, knowledge and skills of farmer groups and their members in achieving mutually agreed goals

The easier of Science, Technology and Information access

Yudiarini et al., (2014) argues that the problems that are still inherent in farmers and farmer institutions in Indonesia are 1) the lack of insight and knowledge of farmers on production management issues and marketing networks, 2) farmers are not fully involved in agribusiness activities, they still focused on production activities only, 3) farmer institutions have not run optimally. Therefore, the easiness of science, technology and information access will increase farmers' knowledge so that they can motivate farmers to be more passionate to do farming business because they are able to encourage productive activities and new innovations in agriculture in order to increase income and welfare of farmers. Ardelia et al., (2020) revealed that the higher the percentage support of technology access, it means that the physical environment and social environment of the respondents are more conducive. It is expected to motivate

farmers in farming business and finally it can increase their innovativeness and awareness to find the information they need.

The government through related official facilitates farmers' access to science, technology and information by establishing village farmer information network system. The information conveyed through that system covers various matters related to agricultural businesses namely product prices and marketing, cultivation techniques (for examples land management, fertilization, etc.), crop rotation and recommended planting calendars, and so on. Through this system, Field Agricultural Extension (PPL) can also provide counseling to farmers, for example by using the whatsapp application or telegram, so that farmers and Field Agricultural Extension are joined in group conversations that connect the two parties, through that application can monitor farming activities done by farmers/farming groups. In addition, farmer groups can do consultations through that application regarding problems in farming activities

CONCLUSION

Based on the results of the analysis and discussion, the conclusions are:

1. Central government policies are a priority to be achieved because the results of data analysis showed higher priority vector compared to regional government policies. The central government in take policies must consider the interests and welfare of farmers and not take policies that can harm farmers. The government's policy doing rice importing during the harvest season is very detrimental to farmers because the amount of rice or food will be abundant which causes rice prices to become cheap or drop and the government tends to be unable to control the market. Therefore, the government is not allowed to do rice import during main harvest and to fulfill food needs during rainy season, the government must store or supply sufficient amounts of rice until the main harvest.
2. Related to central government policy factors, farmers' protection become priority because the results of data analysis showed higher priority vector compared to farmers' empowerment. The central government must determine the government purchase price (HPP) and must ensure that the prevailing price in the market must be in accordance with the HPP and pressure buyers who buy rice or grain that do not comply with the HPP if necessary revoke business licenses for unscrupulous entrepreneurs.
3. Related to farmers' protection, optimizing the role of Bulog and implementing Warehouse Receipts is a priority because the results of data analysis showed a higher priority vector compared to other alternative criteria.
4. Related to farmers' empowerment, the systems development and facilities of agricultural products marketing is a priority because the results of data analysis showed a higher priority vector compared to other alternative criteria.
5. Based on the results of AHP calculations, in determining strategy of agricultural sub-sector development in improving farmers' welfare, the central government policy needs to be considered and prioritized. Then to achieve farmers' welfare, the sub-criteria of farmers' protection must be prioritized. Furthermore, the alternative that must be priority in determining the strategy is optimizing the role of Bulog and implementing warehouse receipts. The central government must restore the role of PERUM BULOG, namely as

national food supplier and restores the role of PERUM BULOG as supplier of rice for the poor communities which is now become pre-prosperous rice so that PERUM BULOG can provide and buy rice in large quantities with HPP prices so that entrepreneurs do not become single players and to avoid market monopoly. Furthermore, regional BULOG PERUM must be supplier of quality rice for the needs of the TNI, POLRI, ASN and BULOG PERUM must be able to produce premium quality rice at medium prices. To realize it, PERUM BULOG must have modern rice milling plant (RMP) and completed with supporting facilities and infrastructure (warehouses, dryers, etc.) in areas where rice is produced.

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