Strategies for Increasing the Competence and Independence of Rice Farmers in Agribusiness for Increasing Rice Productivity and Income in Banjar District

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Abstract:
One of the factors that influence the success of agribusiness management is the level of farmers' independence, both technical and managerial independence. Community independence is an effort to facilitate the community to optimize the availability of resources to carry out production, economic, social and ecological activities. Indicators of farmer independence are self-development, management skills and social skills. The high and low level of success of farmers in sustainably managing their farming is an aspect that affects business optimization in increasing the competitiveness and welfare of farmers.

In general, this study aims to (1) identify the level of competence, capacity, and independence of rice farmers, (2) analyze the factors that affect the competence, capacity and independence of rice farmers. (3) analyze the effect of independence on rice productivity and (4) determine strategies in order to improve the competence, capacity and independence of rice farmers in Banjar Regency

The results showed that the competence of farmers was weak due to the weak role of extension workers, lack of innovation received by farmers and low formal education. The capacity of farmers is weak in organizing and adapting to the environment due to the low competence of farmers. The independence of rice farmers in the low category is good for filterability, management, and social. low self-reliance due to low institutional capacity and support, thus affecting the low self-reliance of farmers

The formulation of strategies to increase self-reliance is to strengthen extension agents' institutions, improve farmers' capabilities in managing innovation and information, strengthen farmer groups through facilities and capital, establish and strengthen farmer cooperatives, increase farmers' independence in environmental adaptation and improve external institutions.

Based on the results of this study, can be suggested: (1) increasing the independence of farmers by paying attention to the characteristics of farmers, increasing the role of agricultural extension workers, the availability of innovation, and institutional support, (2) increasing mutually beneficial cooperation with banks, the private sector and other actors. Marketing and (3) developing institutions as a forum for the learning process for farmers, a vehicle for cooperation, units providing production facilities and infrastructure, production units, processing and marketing units, and supporting service units.

Key Word*: competence, capacity, farmer independence, rice productivity*

I. Introduction

The challenge of agribusiness development is the low quality of human resources of farmers, both personal characteristics and socio-economic characteristics. What farmers understand and do is limited to product technology, so farmers depend on production technology. Efforts to understand the technology and seek more practical information for farming are not carried out due to counselling merely conveying technology. This causes the ability of farmers in farming to below. Farmers only expect the assistance of production technology without seeking more appropriate information to increase farm productivity.

Increased productivity is obtained by improving location-specific technology, both cultivation, processing, and marketing. Increased productivity can be supported by increasing the capacity and independence of farmers to increase farmers' income and welfare. The ability of farmers to access markets, including the use of capital and the bargaining position of farmers from marketing results, is very much needed by farmers. Individual capacity and independence can be formed by three domains of behaviour, namely knowledge (cognitive), mental attitude (affective), and skills (psychomotor) that exist within a person.

One of the determinants of agricultural management success is farmers' independence, both technical and managerial independence. Indicators of farmer independence are self-development, management skills and social skills. The high and low level of success of farmers in a sustainable manner is an aspect that affects the optimization of business in increasing the competitiveness and welfare of farmers.

In general, this study aims to design a strategy to increase the competence of agribusiness and rice farmers' independence in farming to increase rice productivity and income in Banjar Regency.

II. Material And Methods

Location of the Research: The investigation was purposefully limited to one sub-district within Banjar Regency, namely Astambul District. The selection is still based on the fact that the sub-district contains the most rice fields in Banjar Regency, with 4,781 hectares of irrigated land and 14,271 hectares of non-irrigated land.

Methods and Procedures for Analysis: Computer software was used to analyze and evaluate the data collected, specifically Microsoft Excel, AMOS, and Expert Choice. In establishing the model and strategy through the AMOS program's Structural Equation Model (SEM) analysis. Meanwhile, the Analytical Hierarchical Process (AHP) method is used to design the extension strategy for boosting farmers' competence, capacity, and independence.

The purpose (level 1) of this study is to determine the selected strategy design based on the AHP's hierarchical structure. The criteria (level 2) and sub-criteria (level 3) are stated as influencing variables, and numerous alternative techniques are offered at level 4 (alternative).

III. Result and Discussion

Farmer competence refers to a farmer's capacity to engage in agricultural tasks such as cultivation, harvesting, post-harvest processing, and marketing. Farmers' competency is influenced by various variables, including informal education, formal education and experience, the role of agricultural extension workers, access to innovation, and institutional support.

Farmer independence is defined as the capacity to make judgments and filter information useful for farming, the capacity to enhance rice quality and satisfy market demands (competitiveness), the capacity to manage based on progress and needs, management, and social responsibility (ability to build cooperation with other parties).

Farmers' Self-Sufficiency as a Means of Increasing Rice Farm Productivity

The SEM analysis reveals a link between rice farmers' competence, ability, independence, and productivity in Banjar Regency. Validity evaluations using Confirmatory Factor Analysis (CFA) indicate that the factors analyzed have a high degree of validity for the model's quality.

Test of overall model fit: Based on a probability level of 0.881 (more than 0.05), a GFI value of 0.956, and an AGFI value of 0.919 (very close to 1), the RMR value is 0.064 (0.08), suggesting that the whole model is judged fit.

Table 1. Model Validation (RMR test, GFI)

Model	RMR	GFI	AGFI	PGFI
Default model	.064	.956	.919	.521
Saturated model	.000	1.000		
Independence model	.260	.639	.559	.523

NFI rating of 0.481 and RFI value of 0.373 indicate that the model is sound (close to 1). The values of RMSEA, AIC, and ECVI indicate that the default model is adequate.

Table 2. Model Validation (Baseline Comparison Test, Root Mean Square Error, Area Under the Curve, and ECVI

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.481	.373	.721	.624	.689
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.107	.083	.130	.000
Independence model	.174	.156	.192	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	465.727	614.342		
Saturated model	550.000	1036.538		
Independence model	662.157	740.003		

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	9.505	8.630	10.541	12.538
Saturated model	11.224	11.224	11.224	21.154
Independence model	13.513	12.153	15.030	15.102

Based on the analysis above, it can be concluded that the model can be continued in the structural model analysis.

Factors affecting rice farmers' competence, capacity, and independence in Banjar Regency

Figure 1 depicts the structural equation model of the factors affecting rice farmers' competence, capacity, and independence levels. According to the structural model's estimated parameters, the direct and indirect impacts between the tested study variables may be interpreted in the farmer's independence model for boosting rice farming production in the Regency of Banjar.

The direct influence of each variable is shown in Table 3. The direct influence can be demonstrated by examining the path coefficient between two variables, whereas the paths sequence determines the indirect effect through one or more intermediary variables.
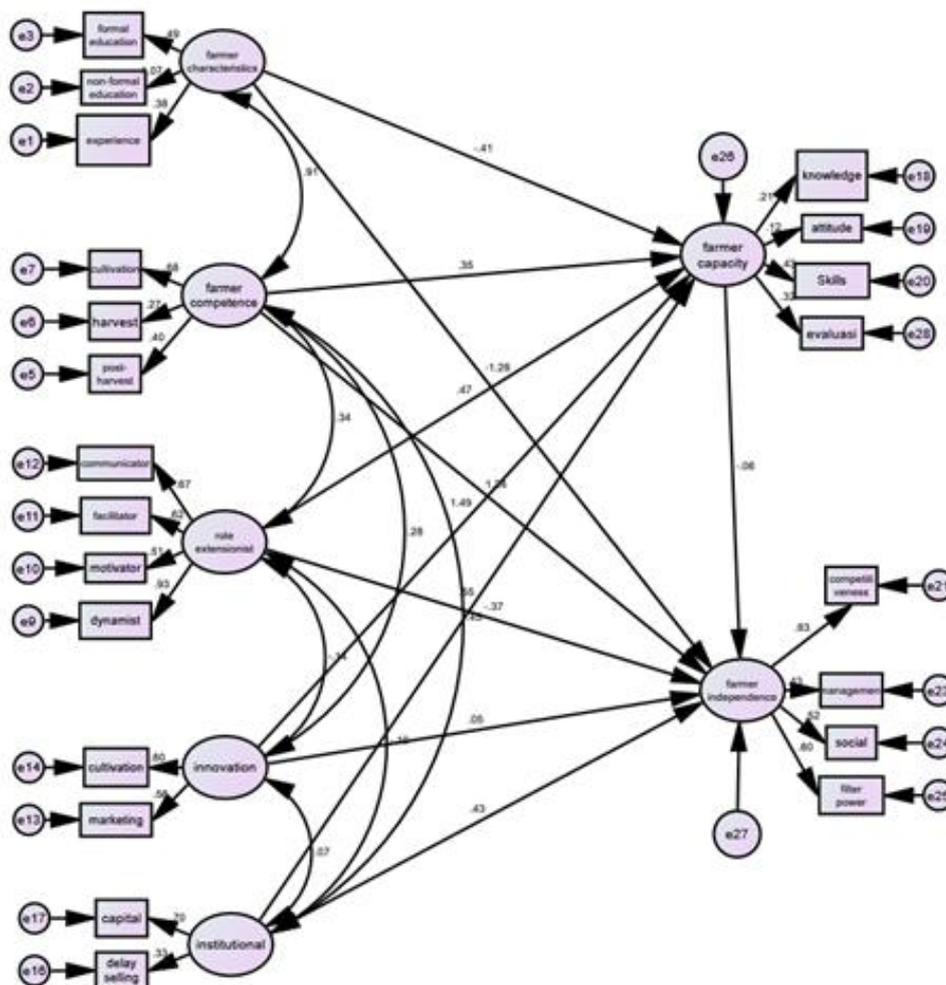

Figure 1. Farmer independence is a model for enhancing agricultural rice output in Banjar Regency

Table 3. Influence model estimated using standardized loading

unidirectional relationship			Estimate	S.E.	C.R.	P
farmer_capacity	<---	innovation	.481	.243	1.981	.048
farmer_capacity	<---	institutional	.347	.363	.957	.338
farmer_capacity	<---	farmer_characteristics	.131	.322	.406	.685
farmer_capacity	<---	farmer_competency	.164	.505	.325	.745
farmer_capacity	<---	extension_role	.089	.095	.940	.347
farmer_independence	<---	farmer_competence	2.978	3.618	.823	.410
farmer_independence	<---	extension_role	.352	.617	.571	.568
farmer_independence	<---	institutional	1.366	2.310	.591	.554
farmer_independence	<---	innovation	.074	.754	.098	.922
farmer_independence	<---	farmer_capacity	.307	.902	.340	.734
farmer_independence	<---	farmer_characteristics	2.054	2.400	.856	.392

Two-way relationship			Estimate	S.E.	C.R.	P
farmer_characteristics	<-->	farmer_competency	.095	.050	1.920	.055
farmer_competency	<-->	extension_role	.059	.031	1.893	.058
extension_role	<-->	innovation	.035	.055	-.631	.528
institutional	<-->	innovation	.005	.022	.242	.808
farmer_competency	<-->	innovation	.029	.022	1.279	.201
institutional	<-->	farmer_competency	.023	.015	1.524	.128
institutional	<-->	extension_role	.013	.028	-.459	.646

The analysis's findings indicate that farmer competence is positively correlated with farmer competence, the involvement of agricultural extension workers, institutions, the availability of innovation, farmer capacity, and farmer characteristics. This suggests that enhancing farmer competence is possible through the participation of agricultural extension workers, institutions, the availability of innovation, and farmer capability and characteristics.

The instructor's position as a communicator is the most powerful signal of the extension worker's job as a communicator, facilitator, dynamist, and motivator.

Rice farmers' knowledge, attitudes, and skills in rice planting, harvesting, and marketing are critical to improving. This can be accomplished through effective learning in problem-based counselling (non-formal education) and case studies.

Agricultural innovation has the potential to benefit output, household food security, and farmer revenue. Agricultural innovations include the acceptance of new plant types, the potential to enhance household economics and food security, and the ability of disadvantaged farmers to participate in economic progress. Access to technological innovation demonstrates that farmers require a fundamental understanding of how technology works and that the extension process must be tailored to the circumstances and needs of smallholder farmers.

Farmers' increased capacity is contingent upon their skill in cultivation, harvesting, and post-harvest. The structural equation model analysis results of the factors affecting the level of farmer's capacity indicate that the factors affecting the level of farmer's capacity are directly related to the farmer's level of competence.

Farmers' organization is the most important measure of farmer capability, followed by environmental adaptation. The group's mission is to solve problems and develop solutions for dealing with plant pests and diseases and share information about cultivation, the environment, and post-harvest management.

The major indicator of institutional support, capital, and processing variables in marketing is institutional support. According to the regression coefficient, institutional support has a negative influence, implying that the more institutional help, the less independent farmers are. This causes farmers' low independence because the marketing process is managed at the sub-district, district, and provincial levels by local marketing agencies (capital owners). The process of selling the produce remains agency-dependent; farmers lack bargaining power in marketing since intermediaries set pricing. Farmers lack the confidence to determine which marketing agency would generate the highest return for their farming operation.

Farmers can achieve independence by partnering with other farmers and farmer group organizations to promote further developed agriculture and make farmers richer (increase in production and income). Based on the findings of statistical tests conducted on research variables affecting farmer competence, capacity, and independence, as well as the findings of qualitative analysis, a strategy model for developing farmer independence can be developed by increasing farmer capacity and competence with the assistance of extension workers, the availability of innovation, institutional support, and farmer characteristics adequate.

Strategy to Increase Competence and Capacity of Farmers in Efforts to Improve Farmers' Independence

AHP analysis is used to develop a strategy for increasing farmer competence and capacity to increase farmer independence. AHP analysis employs two hierarchies, the first determining factor in increasing farmer productivity and income, and the second is a strategy based on these determinants. The chart below illustrates the hierarchy of interests.
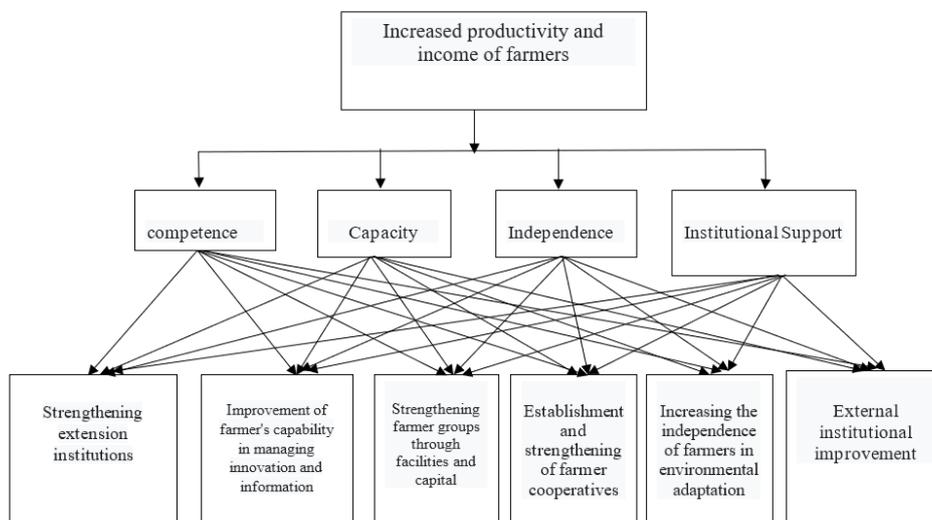
Figure 2. Hierarchy chart of strategies in order to increase farmers' productivity and income

According to the chart above, productivity and income growth are influenced by internal characteristics (competence, capacity, and independence) and external factors, including institutional assistance. Six strategies were developed based on these factors: (1) strengthening farmer capabilities for managing innovation and information, (2) strengthening farmer groups through facilities and capital, (3) strengthening extension service institutions, (4) establishing and strengthening farmer cooperatives, (5) strengthening external institutions, and (6) increasing farmer independence in environmental adaptation. The order of importance and priority of the strategies is determined using the findings of the AHP analysis, as illustrated in the picture below.
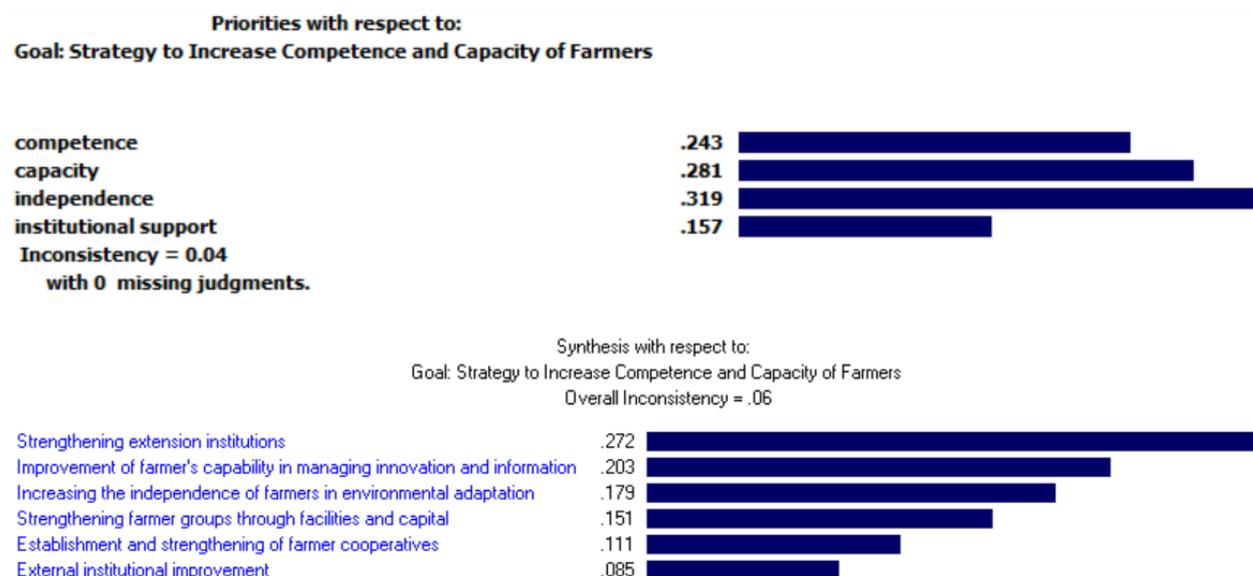
Priorities with respect to:
Goal: Strategy to Increase Competence and Capacity of Farmers

competence	.243
capacity	.281
independence	.319
institutional support	.157

Inconsistency = 0.04
with 0 missing judgments.

Synthesis with respect to:
Goal: Strategy to Increase Competence and Capacity of Farmers
Overall Inconsistency = .06

Strengthening extension institutions	.272
Improvement of farmer's capability in managing innovation and information	.203
Increasing the independence of farmers in environmental adaptation	.179
Strengthening farmer groups through facilities and capital	.151
Establishment and strengthening of farmer cooperatives	.111
External institutional improvement	.085

Figure 3. Priority measures for increasing rice farmers' production and income

According to Figure 3, while developing a strategy to boost farmers' production and income, the hierarchy of importance is independence, followed by ability, competence, and institutional assistance. The priority sequence of strategies is determined by their relative importance, as follows: (1) strengthening extension

institutions, (2) improving farmer capabilities for managing innovation and information, (3) increasing farmer independence in environmental adaptation, (4) strengthening farmer groups through facilities and capital, (5) establishing and strengthening farmer cooperatives, and (6) improving external institutions.

Farmers' independence can be enhanced by expanding the role of agricultural extension workers. Extension workers' roles as communicators, consultants, dynamists, motivators, organizers, educators, and facilitators all indirectly affect farmers' independence, particularly on their competence in cultivation, harvesting, and post-harvest. Additionally, it can indirectly boost farmers' independence in terms of filterability, competitiveness, and comparability. In practice, the extension process should include various materials, including method demonstrations, hands-on practice, plot displays, comparative studies, and internships. As a result, policymakers should prioritize rice farmers' interests by enhancing the role of participatory extension services.

Rice productivity is low due to several factors, including low farmer competence (cultivating, harvesting, post-harvest, processing, and marketing), farmer capacity (farm management, farmer organization, and environmental adaptation), and farmer independence, all of which affect farmers' limited ability to adapt to their farming environment.

Rice farmers' independence is facilitated by institutional help in marketing and capital. These institutions are meant to exist independently of farmers. Weak institutional support for capital will affect farmers' access to inputs, hence reducing productivity. As a result, government support is required for institutional strengthening. This government assistance is a regional regulatory framework that governs the legality of marketing and capital institutions, where this institution can meet the demands of rice farmers and help them achieve self-sufficiency.

Acknowledgements

IV. Conclusion

Conclusion
1. The institutional capability and support of farmers affect their independence.
2. Farmers lack competence due to a limited role for extension workers, a lack of innovation received by farmers, and a lack of formal education. Due to farmers' lack of expertise, their capacity for organization and adaptation to the environment is limited.
3. The level of competence of rice farmers is impacted by (a) the intensity of non-formal education attendance, (b) the motivation to develop farming, (c) the involvement of agricultural extension workers, and (d) institutional support. The major determinants of rice farmers' capability are (a) motivation for agricultural growth, (b) adherence to tradition, (c) the function of agricultural extension workers, and (d) the availability of innovation. Farmers' level of independence is influenced by the following factors: (a) their level of formal education, (b) the intensity with which they pursue non-formal education, (c) the role of agricultural extension workers, (d) the availability of innovation, (e) institutional support, (f) their level of competence, and (g) their level of capacity.
4. The priority sequence for increasing self-reliance is to strengthen extension workers' institutions, to improve farmers' capabilities for managing innovation and information, to strengthen farmer groups through facilities and capital, to establish and strengthen farmer cooperatives, to increase farmer independence in environmental adaptation, and to strengthen external institutions.

Suggestion
1. They are improving farmer independence by considering farmer characteristics, expanding the role of agricultural extension workers, increasing innovation availability, and institutional support. Through rigorous extension institutions, the central and local governments provide participatory counselling and training to assist rice farmers in improving their independence. The extension is implemented by taking into account the following factors: (a) farmers' information needs; (b) the necessity for building business, capital, and market partnerships; and (2) expanding mutually beneficial collaboration with banks, the private sector, and marketing actors. Cooperation takes the form of simplified access to business financing, agricultural inputs like fertilizers, herbicides, insecticides, improved rice seeds, and a selling procedure that involves farmer groups as collectors.

2. It is developing institutions for the primary actors in the learning process for farmers, a vehicle for cooperation, production units, processing and marketing units, and supporting service units. The institution can shape a group, a conglomeration of organizations, an association, or a corporation. The government and local governments encourage and empower the primary institutional actors to grow and develop into a robust and self-sufficient organization capable of meeting the expectations of its members.

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