Increasing the Agribusiness Competence of Pepper Farmers in the Border Area of West Kalimantan

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ABSTRACT

This study aims to formulate an extension model for pepper farmers to improve agribusiness competence. The research method uses quantitative. The population is farmers in 14 (fourteen) sub-districts of the West Kalimantan Border Region. The sampling technique used was multistage cluster sampling. The number of samples was 160 pepper farmers. Data collection techniques using questionnaires and documentation. The data processing and analysis technique used Structural Equation Modeling (SEM). The results of the study conclude that: First, to improve the competence of farmers, extension workers must pay attention to the level of formal education of farmers, the learning process, access to capital sources, and access to agribusiness facilities. Second, to improve the learning process, variables that need to be considered are farmer participation in community institutions and access to information sources. Third, to increase participation in community institutions, the variables that need to be considered are the level of formal education and motivation. Fourth, to increase motivation, the factor that needs to be considered is farming experience. Fifth, to increase access to agribusiness facilities, the variable to be considered is access to capital sources.

Keywords: Competence, Learning, Education, Experience, Motivation, Participation, Access.
INTRODUCTION

Indonesia is one of the main producers and exporters of pepper in the world besides Vietnam, Brazil, India, and Malaysia. Contributes to the country's fourth foreign exchange after palm oil, rubber, and coffee for plantation commodities. However, according to International Pepper Community data (IPC, 2018), the share of Indonesian pepper exports continues to decline. From 2008 to 2016, Indonesia was still the largest pepper producing and exporter country after Vietnam, but the position shifted to become the third pepper exporter country after Vietnam and Brazil in 2017 and 2018 (Fazaria, 2016). Problems that arise in Indonesia are low productivity (still below 1,000 kilograms per hectare, while in other countries more than 2,000 kilograms per hectare). As Rosman and Suryadi (2018) state that the reason is caused by traditional processing methods. National pepper productivity experienced an average decrease of 2.29% annually from 2014 to 2020. A fairly sharp decline occurred between 2014-2015 with a decrease of 10% and reached the lowest productivity in 2017 of 798 kg/ha (Direktorat Jenderal Perkebunan, 2019). Kemala (2011) explains that the factors that cause the undeveloped pepper agribusiness system in Indonesia include: 1) Most of the technology can not be used by farmers. 2) Unavailability of equipment that is easily available and cheap. 3) Lack of diversification of pepper products. 4) There are Indonesian competitors as world pepper producers (Brazilia, India, Malaysia, Sri Lanka, Thailand, and Vietnam). 5) The research results have not been widely absorbed by farmers.

In Indonesia, there are six largest pepper-producing regions, namely Bangka Belitung Islands, Lampung, South Sulawesi, Southeast Sulawesi, South Sumatra, and West Kalimantan with an average production of 5,001 tons with a contribution of 5.74% of Indonesia's total pepper production (Direktorat Jenderal Perkebunan, 2019). In 2020, West Kalimantan is included in the 6 (six) largest pepper exporting areas in Indonesia (Directorate-General for National Export Development, 2020). Most of West Kalimantan's pepper planting areas are located in the border areas of the country, namely in Sanggau, Sintang, Kapuas Hulu, Sambas Regencies, and Bengkayang with an area of 9,509 hectares or about 90% of the total pepper planting area in West Kalimantan province (BPS Kalimantan Barat, 2020).

Based on the results of initial observations and interviews with several community leaders in the border area and the Plantation and Livestock Service Office of Sanggau Regency, the condition of infrastructure in the border area is still not supportive, causing some pepper farmers to wait for more middlemen or traders who buy pepper from farmers apart from handling postharvest has not been carried out properly as evidenced by the high levels of dirt and microorganism contamination which importers often complain about.

LITERATURE REVIEW

Cognitive social theory or social learning theory (Bandura, 1986) was used to determine the direction of this research. This theory explains that between a person’s behavior, cognitive factors, and other individual characteristics (cognitive and other personal factors), as well as events in the environment (environmental events) interact reciprocally or in two directions (reciprocal determinism), all of which act as determining factors that interact with each other in the learning process and determine learning outcomes. Learning outcomes can be in the form
of farmer competencies in the field of pepper agribusiness. Indrawati et al. (2011), farmer competence is the result of the farmer’s learning process which is determined by the interaction between individual farmers and farming environmental factors, through a learning process. Spencer and Spencer (1993) explain that each individual competency as a human characteristic can be developed into standard behavior through counseling and training.

The learning process carried out through extension activities is measured by the parameters of the intensity of extension, the ability of the instructor, and the suitability of the material to the needs of pepper farmers. Access to farmer groups is measured based on the formation of farmer groups, benefits, and interactions between members of farmer groups (Harijati, 2007). Access to agribusiness facilities, sources of capital, and information sources is measured by the number/type of facilities and their sources as well as the suitability of these sources to the needs of pepper farmers. Pepper farmers’ agribusiness competencies include cultivation technical competence and managerial competence in pepper farming (Rayuddin, 2010). Cultivation technical capabilities include the preparation of facilities and equipment, skilled in how to conduct a production business, carry out product processing and be responsive in making choices of marketing channels, while managerial abilities include reliable farming management in planning, organizing, implementing, and supervising farming activities, having the ability to create a farming business network and able to make the right decisions to control farming risk (entrepreneurial attitude). Schematically, the relationship between the variables studied can be seen in Figure 1.

Figure 1. Research Framework

![Research Framework Diagram]
RESEARCH METHOD

The research method was quantitative research with the type of explanation. The research population was pepper farmers in 14 (fourteen) sub-districts in the border area of West Kalimantan. The sampling technique is multistage cluster sampling. The number of research samples was 160 pepper farmers. Data collection techniques used questionnaires and documentation. The data processing and analysis technique used Structural Equation Modeling (SEM).

RESULTS

Relationship Between Research Variables
Based on SEM analysis, it is known that exogenous variables that have a direct and positive effect on endogenous variables are: (1) participation in community institutions on the level of learning process of pepper farmers (cr= 2.019 & p= 0.044); (2) access to information sources on the level of pepper farmers’ learning process (cr= 2.328 & p= 0.020); (3) formal education on agribusiness competence of pepper farmers (cr= 2.890 & p= 0.004); (4) access to agribusiness facilities to the competence of agribusiness pepper farmers (cr= 14.658 & p= 0.000); (5) access to capital sources for pepper farmers’ agribusiness competence (cr= 3.449 & p= 0.000); (6) the level of the pepper farmers’ learning process on the agribusiness competence of pepper farmers (cr= 25.256 & p= 0.000).

Modification of the Relationship Model between Research Variables
Modification of the relationship model between research variables to obtain an optimal relationship model can be done by paying attention to the significance of the relationship between exogenous variables. Based on the consideration that there is a positive and significant relationship between exogenous variables, such formal education is significantly correlated with participation in community institutions. Not only that but access to agribusiness facilities is significantly correlated with access to capital sources. The farming experience is significantly correlated with motivation. Moreover, farming experience is significantly correlated with formal education. Therefore, these variables are correlated to obtain a relationship model as shown in Figure 2.

Figure 2. Modification of the Relationship Model between Research Variables
Based on the results of the SEM test, it is known that exogenous variables that have a direct and positive effect on endogenous variables are: 1) farming experience on motivation (cr = 2.064 & p = 0.039); 2) motivation towards participation in community institutions (cr = 5.027 & p = 0.000); 3) formal education on agribusiness competence of pepper farmers (cr = 2.776 & p = 0.006); 4) participation in community institutions on the level of pepper farmers’ learning process (cr = 2.017 & p = 0.035); 5) access to information sources on the level of pepper farmers’ learning process (cr = 2.723 & p = 0.006); 6) access to capital sources to access to agribusiness facilities (cr = 15.924 & p = 0.000); 7) formal education on agribusiness competence of pepper farmers (cr = 2.376 & p = 0.017); (8) access to agribusiness facilities to the competence of agribusiness pepper farmers (cr = 16.259 & p = 0.000); (9) access to capital sources on the competence of pepper farmers agribusiness (cr = 2.825 & p = 0.005); 10) the level of the pepper farmers’ learning process on the agribusiness competence of pepper farmers (cr = 24.601 & p = 0.000).

Feasibility of the Relationship Model between Research Variables
Based on the test results on the model of the relationship between the research variables that have been motivated, the feasibility of the model can be seen in Table 1 below.

**Table 1. Model Feasibility Test Results**

<table>
<thead>
<tr>
<th>No</th>
<th>The goodness of the Fit Index</th>
<th>Limit Value</th>
<th>The calculation results</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chi-Square</td>
<td>&lt; 214.477</td>
<td>29.411</td>
<td>good fit</td>
</tr>
<tr>
<td>2</td>
<td>Significance probability</td>
<td>0.05</td>
<td>0.044</td>
<td>good fit</td>
</tr>
<tr>
<td>3</td>
<td>DF</td>
<td>&gt;0</td>
<td>18</td>
<td>Over identified</td>
</tr>
<tr>
<td>4</td>
<td>NFI</td>
<td>0.90</td>
<td>0.952</td>
<td>good fit</td>
</tr>
<tr>
<td>5</td>
<td>IFI</td>
<td>0.90</td>
<td>0.981</td>
<td>good fit</td>
</tr>
<tr>
<td>6</td>
<td>CFI</td>
<td>0.95</td>
<td>0.980</td>
<td>good fit</td>
</tr>
<tr>
<td>7</td>
<td>TLI</td>
<td>0.95</td>
<td>0.960</td>
<td>good fit</td>
</tr>
<tr>
<td>8</td>
<td>CMIN/DF</td>
<td>2.0</td>
<td>1,634</td>
<td>good fit</td>
</tr>
<tr>
<td>9</td>
<td>RMSEA</td>
<td>0.08</td>
<td>0.063</td>
<td>good fit</td>
</tr>
</tbody>
</table>

Based on Table 1 above, it can be concluded that the overall model of the relationship between research variables is acceptable. Thus, modification of the structural model can be used to explain the relationship and influence between exogenous variables and endogenous variables.

**Direct, Indirect, and Total Influence**
Based on SEM analysis, the magnitude of the direct effect, indirect effect, and the total effect of exogenous variables on endogenous variables can be seen in Table 2 below.
Table 2. Direct, Indirect, and Total Influence

<table>
<thead>
<tr>
<th>Exogenous</th>
<th>Mediator</th>
<th>Endogenous</th>
<th>Direct Influence</th>
<th>Indirect Influence</th>
<th>Total Influence</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience</td>
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<td>Motivation</td>
<td>0.162</td>
<td>-</td>
<td>0.162</td>
<td>Direct effect</td>
</tr>
<tr>
<td>Experience</td>
<td>Motivation</td>
<td>Participation</td>
<td>-0.078</td>
<td>0.059</td>
<td>-0.019</td>
<td>Motivation as a mediator</td>
</tr>
<tr>
<td>Motivation</td>
<td>-</td>
<td>Participation</td>
<td>0.368</td>
<td>-</td>
<td>0.368</td>
<td>Direct effect</td>
</tr>
<tr>
<td>Motivation</td>
<td>Participation</td>
<td>Learning</td>
<td>0.000</td>
<td>0.021</td>
<td>0.021</td>
<td>Participation as a mediator</td>
</tr>
<tr>
<td>Education</td>
<td>-</td>
<td>Participation</td>
<td>0.202</td>
<td>-</td>
<td>0.202</td>
<td>Direct effect</td>
</tr>
<tr>
<td>Education</td>
<td>Learning</td>
<td>Competence</td>
<td>0.059</td>
<td>0.020</td>
<td>0.079</td>
<td>Direct effect</td>
</tr>
<tr>
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<td>Participation</td>
<td>Learning</td>
<td>0.000</td>
<td>0.033</td>
<td>0.033</td>
<td>Participation as a mediator</td>
</tr>
<tr>
<td>Participation</td>
<td>-</td>
<td>Competence</td>
<td>0.162</td>
<td>-</td>
<td>0.162</td>
<td>Direct effect</td>
</tr>
<tr>
<td>Participation</td>
<td>Learning</td>
<td>Competence</td>
<td>0.000</td>
<td>0.099</td>
<td>0.099</td>
<td>Learning as a mediator</td>
</tr>
<tr>
<td>Information</td>
<td>-</td>
<td>Learning</td>
<td>0.209</td>
<td>-</td>
<td>0.209</td>
<td>Direct effect</td>
</tr>
<tr>
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<td>Learning</td>
<td>Competence</td>
<td>0.000</td>
<td>0.127</td>
<td>0.127</td>
<td>Learning as a mediator</td>
</tr>
<tr>
<td>Capital</td>
<td>-</td>
<td>Competence</td>
<td>0.111</td>
<td>-</td>
<td>0.111</td>
<td>Direct effect</td>
</tr>
<tr>
<td>Capital</td>
<td>Facilities</td>
<td>Competence</td>
<td>0.111</td>
<td>0.498</td>
<td>0.609</td>
<td>Facilities as a mediator</td>
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<tr>
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<td>-</td>
<td>Competence</td>
<td>0.639</td>
<td>-</td>
<td>0.639</td>
<td>Direct effect</td>
</tr>
<tr>
<td>Learning</td>
<td>-</td>
<td>Competence</td>
<td>0.609</td>
<td>-</td>
<td>0.609</td>
<td>Direct effect</td>
</tr>
</tbody>
</table>

**DISCUSSION**

**The Effect of Farming Experience on Motivation**
Farming experience has a positive and significant effect on farmers' motivation. This is supported by the results of research by Syahrial (2019); Dewi and Mulyatiningsih (2013) that entrepreneurship experience affects entrepreneurial motivation. Competence can only be achieved in the long term (Kristanto, 2009) says that experience in running a business is one of the keys to success in running
a business, especially if the business is related to previous business experience. Venesaar, Kolbre, and Piliste (2006) explain that a person's motivation to become an entrepreneur is divided into three dimensions. The first one is Ambition for freedom (freer activities, owning your own business, being more respected, leading in implementing new ideas, developing hobbies in business). The second one is Self-realization (get a better position in society, feel the challenge, motivate and lead others, continue the family tradition, implement ideas or innovate, follow others). The last one is pushing factors (lose a job, get a better income, dissatisfied with the job).

The Effect of Motivation on Participation in Community Institutions
Farmer motivation has a positive and significant effect on farmer participation in community institutions. This is supported by the research results of Alam, Rizal, and Rohmatulloh (2020) that motivation affects the participation of community members in the preservation of Pandanwangi rice, and the results of research by Waluyo and Solikah (2021) that motivation has a positive and significant effect on community participation in preventing cases of Dengue Hemorrhagic Fever (DHF). Motivation is a change in energy in a person which is marked by the emergence of feelings and is preceded by a response to the existence of a goal. As Sulila (2019) states Motivation can be a driving force for someone to carry out an activity to get the best results. The motivational component consists of two components, namely the inner component and the outer component. The internal components are changes in a person, a state of feeling dissatisfied, and psychological tension. The external component is what a person wants, the goal of which is the direction of his behavior. The inner component is the need to be satisfied, while the outer component is the goal to be achieved (Sardiman, 2014). This farmer motivation can increase farmer participation in community institutions. Isbandi (2007) states that participation is community participation in the process of identifying problems and potentials that exist in the community, selecting and making decisions about alternative solutions to deal with problems, implementing the problem solving, and community involvement in the process of evaluating changes that occur.

The Effect of Formal Education on Participation in Community Institutions
Formal education taken by farmers has a positive and significant effect on farmer participation in community institutions. This is supported by the results of research by Waluyo and Solikah (2021) that the level of knowledge has a positive and significant effect on community participation in preventing cases of Dengue Hemorrhagic Fever (DHF), and research by Rahmat, Ismail, and Syarifuddin (2021) which concludes that people with higher education are more quickly understand and understand about development programs that will be implemented at the Community Empowerment Institution. Education provides experience to a person through the learning process (Klausmeier & Goodwin, 1975). This level of education can increase farmer participation in community institutions. Adisasmita (2006) explained that the participation of community members is the involvement of community members in the development, including activities in the planning and implementation (implementation) of development programs/activities carried out in the local community.

The Effect of Access to Information Sources on Farmers’ Learning Process
The ability of farmers to gain access to information sources has a positive and significant effect on the learning process of farmers in community institutions. This is supported by the results of the research by Harijati (2007) and Syarief (2015)
who found that access to information sources will improve the learning process, in counseling while at the same time increasing the competence of farmers. Mardikanto (2013) states that the information most needed by farmers is about production technology, followed by marketing and postharvest information. The most frequently accessed media to obtain information are meetings, followed by electronic media and print media. Meanwhile, the factors that influence access to information are age, cosmopolitanism, and level of use of the information.

The Effect of Participation in Community Institutions on Farmers’ Learning Process
The participation of farmers in community institutions has a positive and significant effect on the learning process farmers in community institutions. This is supported by the results of Alif’s research (2017) that the implementation of agricultural extension through demonstrations attracts delivery, and therefore affects the presence of farmers participating in the extension. The results of research by Rosalia, Farid, and Sudarmanto (2019) conclude that the participation of farmers as members has a significant effect on the effectiveness of Agribusiness Microfinance Institutions. This is in line with Iife and Tesoriero’s (2008) statement that Participation causes the psychic and physical mobilization (changes in knowledge, attitudes, and behavior) of farmers to run quickly because the program is implemented according to the needs, priorities, and conditions of the resources they have. Participation in institutions involves a norm, regulation, or organization that facilitates coordination in the form of individual expectations that may be achieved by working together (Rosalia et al., 2019).

The Effect of Access to Capital Sources on Access to Agribusiness Facilities
The ability of farmers to access capital sources has a positive and significant impact on the ability to access agribusiness facilities. This is supported by the results of research by Tedjaningsih, Suyudi, and Nuryaman (2020) that there is a real relationship between social capital variables and the sustainability of Mendong farming. If farmers have sufficient capital (credit), then farmers can optimize their farming resources in order to increase business profits, which in turn increases farmers’ income and welfare (Sudaryanto & Agustian, 2003). This capital can increase access to agribusiness. Agribusiness facilities are an important component to support the successful implementation of agribusiness systems and businesses. Infrastructure development as part of public services will be effective if it is in accordance with the needs/interests of farmers, able to support the business development of farmers, and able to encourage the growth of new businesses. Farmers as the main actors are the subjects in the agribusiness development who are consumers of the services provided by the agribusiness supporting institutions. Agribusiness will run well if there is no gap between supporting institutions and their business activities (Tedjaningsih et al., 2017).

The Influence of Formal Education on Farmers’ Agribusiness Competencies
The level of formal education of farmers has a positive and significant effect on the competence of agribusiness farmers. This is supported by the results of research by Syarief (2015) that education contributes to increasing the competence of farmers. Furthermore, Prijono and Pranarka (1996) explain that essentially, education functions to develop abilities or competencies. Mastuti and Alfiansyah (2016) explain that agribusiness competence is based on the concept of an agribusiness system, namely all activities, starting from the procurement and distribution of production facilities (inputs), farming processes, and up to the
marketing of products produced by farming and agro-industry that are interrelated with each other so that it reaches the final consumer.

**The Influence of Access to Capital Sources on Farmers' Agribusiness Competencies**

The ability of farmers to find access to sources of capital has a positive and significant impact on the competence of farmers' agribusiness. This is supported by the results of Syariel's research (2015) that access to capital sources contributes positively to the competence and perception of farmers towards the learning process. Sudaryanto and Agustian (2003) add that even with sufficient capital (credit) farmers can optimize their farming resources in order to increase their business profits which in turn increases farmers' income and welfare.

In agricultural production process activities, capital is divided into two types, namely fixed and non-fixed capital. Fixed capital is defined as the costs incurred in the production process that does not run out in one production process, for example, factors of production in the form of land, buildings, and machinery. While variable capital or variable capital is the cost of production, for example, the production costs incurred to buy seeds, fertilizers, medicines, or those paid for labor payments (Maryadi, Sutandi, & Agusta, 2016).

**The Effect of Access to Agribusiness Facilities on Farmers' Agribusiness Competencies**

The ability of farmers to develop access to agribusiness facilities has a positive and significant impact on the competence of farmers' agribusiness. This is supported by the results of Syariel's research (2015), which shows that production facilities as a component of environmental factors have a significant effect on farmer competence. Rayuddin (2010) adds that farmers' easy access to production facilities as a form of government policy has an influence on increasing farmer competence. Completeness of facilities and learning aids is one indicator of the effectiveness of the learning process, which in the application of agribusiness systems and businesses can be analogous to agribusiness facilities.

**The Effect of Farmer Learning Process on Farmer Agribusiness Competence**

The learning process of farmers has a positive and significant effect on the competence of farmers' agribusiness. This is supported by the results of research by Kustiari et al. (2012) that the effectiveness of extension has a significant effect on the competence of cultivators. The effectiveness of the extension is determined by the role of the extension worker, the communication model, and the functioning of the extension. Agricultural extension as a farmer empowerment system is a non-formal education system for farming families that aims to assist farmers in improving technical skills and knowledge, developing more positive attitude changes, and building independence in managing their agricultural land. In addition to counseling, farmer groups can also be used as a vehicle for learning, which allows farmer groups to improve their knowledge, attitudes, and skills (Parissing, 2019).
CONCLUSION

From the results study above, the researchers conclude that the extension workers must pay attention to the farming experience that has been carried out by farmers because business experience has a direct effect on farmers' motivation. Besides that, they also have to pay attention to the level of motivation of farmers and farmers' formal education because these two factors directly affect farmer participation. Not only that, extension workers must pay attention to the level of farmer participation and access to information sources owned by farmers because these two factors directly affect the learning process of farmers. As well as encouraging farmers to be able to gain access to sources of capital because this factor can directly affect access to agribusiness facilities and the agribusiness competence of farmers. Moreover, extension workers must pay attention to formal education, the learning process carried out by farmers, the ability to access capital sources, and access to agribusiness facilities owned by farmers because these factors can directly affect the competence of farmers' agribusiness.

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DECLARATION OF CONFLICTING INTERESTS

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