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Preface

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PREFACE

THE 2ND INTERNATIONAL CONFERENCE ON AGRICULTURE AND FOOD SUSTAINABILITY (THE 2ND ICAFOSY): GENDER AND SUSTAINABLE AGRICULTURE DEVELOPMENT

Agricultural development is a kind of resource management effort that uses environmentally friendly approaches to ensure long-term agricultural production capacity and improve farmers' welfare. Natural resource differences indicate diversity in their management in order to meet the sustainability of providing products for humans and development. A lack of clarity in defining the type or characteristics of the resource, as well as an error in managing it, will result in resource damage, if not destruction.

In the current era of globalization, inequity in human access to natural resources and agricultural land is also a source of concern. There are significant gender inequalities in the implementation of access to land resource management in terms of rewarding women for the roles they play in resource conservation, utilization, and preservation, as well as the sustainability of the results. Women have a strong bond with nature. They have more interaction with the environment and natural resources as household managers. Pollution directly affects women and children.

The existence of global events globally affected human life in meeting their daily needs on natural resources, and this is why the Laboratory of Rural Sociology and Community Empowerment, Department of Socio-Economics, Faculty of Agriculture, Universitas Brawijaya held an International Conference titled "The 2nd International Conference on Agriculture and Food Sustainability (The 2nd ICAFOSY): Gender and Sustainable Agriculture Development."

The conference was held in a hybrid format on the 17th and 18th of October 2022 at the Grand Mercure Malang hotel because conditions and situations were not completely normal after the pandemic. Besides, it provides an ideal forum for discussing the state of natural resource management, particularly in the agricultural sector, during the COVID-19 pandemic, as well as an overview of the critical role of women and men in managing Natural Resources, particularly in the agricultural sector.

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Strategic Behavior of Small-Scale Farmers toward Sustainability of Rice Farming: A study of Entrepreneurial skill to Farming Performance

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Abstract. Farm households are the most basic socio-economic and decision-making unit in rural areas. Their livelihood strategies will determine how they exploit natural resources and the efficiency of their use. In general, on-farm and off-farm activities are essential components of livelihood strategies that farmers often adopt to increase their incomes. This research aims to understand the most striking factors related to farmers' entrepreneurship. The study was conducted with a quantitative approach and the location was in Wuluhan Village, Jember Regency Indonesia. Consisting of 50 respondents, this research used Structural Equation Modeling based on WARP-PLS 7.0 to analyze the prominent traits that lead to the best farming performance. While the findings show that most of the variables were significant, it can be clearly seen that initiative was the best trait that describes the farmers in the research area. Thus, in the future, dynamics, leadership and collective bargaining can be developed more in shaping their readiness to face the challenges in sustainable rice farming.

1. Introduction

Farm households are the most basic socio-economic and decision-making unit in rural areas. Their livelihoods and livelihood strategies will determine how they exploit natural resources and the efficiency of their use. In short, farmers will carry out a strategy that can be seen in allocating resources. Agriculture, as an entity, is very heterogeneous even when farmers seek to balance surpluses and constraints on critical resources, namely land, management, capital, and labor [3]. Indeed, not all farmers are entrepreneurs, but entrepreneurship has become the most crucial aspect of agriculture.

Utilization of the potential of agricultural, natural resources, in this case, the land depends on the potential of human resources, especially farmers. So far, the role of farmers as the main actors who have the ability to creativity and creativity has not been maximized. Based on reality, the success of farmers in achieving high farming performance is not only determined by cultivation technique activities. However, it is also determined by the ability of farmers, both attitudes, knowledge, and skills that are actualized in running their farming businesses, starting from planting preparation to



marketing the products produced. Farmer entrepreneurship is an essential factor in determining a market-oriented business's success [1]. Likewise, several opinions say that through business development for small farmers, it is hoped that they will be able to grow and develop innovators and motivator farmers with an entrepreneurial spirit [2]. Entrepreneurship is vital for agribusiness development because farmer entrepreneurship needs to be grown to face the pressures of the market environment that is not [4]. Entrepreneurship is one of the strategic needs for farmers in managing micro businesses based on local resources in rural areas. The intervention of the effects of globalization that enters the realm of the life of rural farming communities requires the optimization of the entrepreneurial function, which is expected to direct behavior oriented towards better farming, better business, and better living. Entrepreneurship can encourage productivity and creativity of farmers' work and increase existing values, so this study discusses the influence of entrepreneurial skill factors on farmer behavior.

2. Research Method

2.1 Respondent and sampling

The population in this study was 50 farmers who cultivate rice. This research used non probability sampling method. Primary data collection in the study was carried out from April to July 2022 through survey and interview methods. The research activities were carried out in Wuluhan Village, Jember Regency as this city considers as the highest rice producers, and the location is most suitable for rice farming.

2.2 Data analysis

The data analysis method used in this research uses Structural Equation Modeling – Partial Least Square (SEM-PLS) through the WARP-PLS 7.0 application. The SEM-PLS data analysis method is suitable for knowing the relationship between factors and farmer entrepreneurship. The independent variable used was based on the main characteristics of farmers such as initiative (X1), dynamic (X2), having a strong leadership (X3) and collective bargaining (X4), while farming performance was the dependent variables.

3. Result and Discussion

3.1 Characteristics of Respondents

Farmers in this research were mostly men which amounted 51.20% and 48.80% was women. Majority were considered very old. aged group of over 62 years has a percentage of 37.35%, followed by ages 36-45 which amounted of 24.10%. The third rank of it was the age group of 36-45 which accounted for 20.48%. And lastly, about 18.07% of farmers aged around 26-35.

Regarding to the educational level, the highest number of respondents was high school/vocational high school graduates with the proportion of 36.14%, then 33% were elementary school graduates and the rest was not even finish elementary school. As the result, this data showed that most of farmers had enough basic education to conduct a farming business.

3.2 Data Analysis Result

3.2.1 Testing Outer Model

a. Validity Test

The requirements for testing the validity of a questionnaire on the SEM-PLS are if the indicator has a loading factor value of > 0.5 and a p-value of < 0.001 , then the model can be said to meet the requirements of convergent validity [5]. In addition, the convergent validity test of the validity assessment can be found through the average variance extracted (AVE) value for each variable in the model and is said to be valid if the value is > 0.50 [5]. The evaluation of the first outer model test can be known through the results of the loading factor and indicator weight for the reflective and formative measurement models for each variable indicator. The validity test is measured using factor loading for the reflective indicator model, if the factor loading is 0.30 and the P-value < 0.001 then the validity test can be accepted [5]. The results of the loading factor can be seen in table 1 below. The inner

model used variable such as as initiative (X1), dynamic (X2), having a strong leadership (X3) and collective bargaining (X4).

Table 1. Output Results of Combined Loading and Cross-Loading

	X1	X2	X3	X4	Y1	Type	P-value
X1.1	(0.822)	0.285	0.205	0.000	-0.186	Reflective	<0.001
X1.2	(0.670)	-0.218	0.908	-0.183	-0.158	Reflective	<0.001
X1.3	(0.808)	-0.353	-0.057	0.123	-0.077	Reflective	<0.001
X1.4	(0.540)	0.364	-1.353	0.043	0.596	Reflective	<0.001
X2.1	-0.086	(0.888)	-0.030	-0.301	0.174	Reflective	<0.001
X2.2	0.078	(0.874)	-0.218	-0.012	-0.125	Reflective	<0.001
X2.3	0.018	(0.466)	0.465	0.596	-0.097	Reflective	<0.001
X3.1	-0.109	0.181	(0.874)	-0.039	-0.045	Reflective	<0.001
X3.2	0.174	-0.126	(0.931)	-0.183	-0.062	Reflective	<0.001
X3.3	-0.075	-0.046	(0.881)	0.232	0.110	Reflective	<0.001
X4.1	-0.025	-0.195	0.008	(0.918)	-0.039	Reflective	<0.001
X4.2	-0.108	0.308	-0.462	(0.907)	0.035	Reflective	<0.001
X4.3	0.140	-0.116	0.478	(0.862)	0.005	Reflective	<0.001
Y1.1	-0.027	0.052	-0.030	-0.063	(0.965)	Reflective	<0.001
Y1.2	0.027	-0.052	0.030	0.063	(0.965)	Reflective	<0.001

Source: Primary Data Processed (2022)

Based on the data from table 1, the loading factor value shows a value of 0.30, then the convergent and discriminant validity in this study are met. The value of p-value on each indicator shows <0.001, which means all indicators have met the requirements and are declared valid.

The next discriminant validity test is to see the value of the square root of average variance Extracted (AVE) with the correlation coefficient of the other variables concerned. The discriminant validity test can be seen when the AVE value in each research variable must be > 0.5. Following are the results of the AVE and the correlation coefficient used to analyze the discriminant validity of the questionnaire.

Table 2. Value of Square Root of AVE

Variable	X1	X2	X3	X4	Y
X1	(0.719)	-0.286	-0.596	-0.445	0.136
X2	-0.286	(0.768)	0.506	0.282	0.344
X3	-0.596	0.506	(0.896)	0.539	0.454
X4	-0.445	0.282	0.539	(0.896)	0.388
Y	0.136	0.344	0.454	0.388	(0.965)

Source: Primary Data Processed (2022)

Based on the data in table 6, it can be seen that the Square Root of the AVE value obtained by each construct is greater than the correlation value between constructs and other constructs in the same column. The AVE value > 0.5 means that 50% or more of the variance of the indicators can be explained well [5], and it concluded that the discriminant validity requirements are accepted.

b. Reliability Test

A composite reliability test is used to see the variables that are said to be able to explain the data from these variables. The criteria used in this test are the composite reliability value must be > 0.7 and Cronbach's Alpha value > 0.6 to indicate that the questionnaire used is reliable [5]. The results of composite reliability and Cronbach's alpha can be seen in table 3.

Table 3. Composite Reliability and Cronbach's Alpha

Variable	X1	X2	X3	X4	X5	Y1
Composite Reability	0.807	0.801	0.924	0.924	0.964	0.807
Cronbach's Alpha	0.675	0.623	0.876	0.877	0.926	0.675

Source: Primary Data Processed (2022)

Based on table 3, the results of the composite reliability test of all research variables have a value of more than 0.7, while Cronbach's alpha test has a value of more than 0.6. The conclusion from the two tests is that all of the research variables have met the reliability test criteria so they have strong reasons to be tested in the structural model (inner model).

3.2.2 Inner Model Test

a. Coefficient of Determination

The value of the coefficient of determination (R^2) is the magnitude of the variance of the endogenous variables that can be explained by exogenous variables. In general, R^2 values of 0.75, 0.50, or 0.25 for endogenous variables can be described respectively as the model is good, moderate, and weak. The results of the coefficient of determination can be seen in table 4.

Table 4. Results of R-square and Adj. R-square

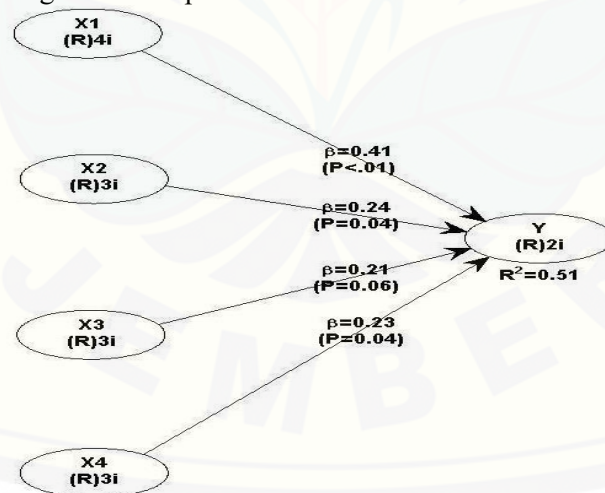
	X1	X2	X3	Y1
R-Squared				0.506
Adj.R square				0.462

Source: Primary Data Processed (2022)

The R-square value interprets the effect of exogenous variables on latent variables. Based on the data in table 4, the result of the R-square value on the Y variable is 0.506. This value can be interpreted that 50.6% of the Y variable can be explained by the variance of the farming intention/interest variable, while the rest is explained by other variables outside the model that are not used in the study. The results of the R-square analysis in this study showed 0.506, so it means the R-square was at a moderate level on the Y variable.

b. Path Coefficient

Path coefficients are used to see the significance between variables which indicate a relationship between exogenous and endogenous variables [5]. The path coefficient criterion is if the value is <0.1 , which indicates that the relationship can be said to be weak. Meanwhile, if the path coefficient value is close to 1 then it has a strong relationship.



Picture 1. Path Coefficient

Based on the path diagram and P-value in the image above, it can be seen that the path coefficients on all constructs have a positive and significant effect on the Y variable. It is evidently in the X1 variable that has an initiative effect on farm performance/business performance (Y1) has a significant effect with a path coefficient value of 0.41 and has a p-value of less than 0.001 ($P<0.01$). Therefore, it can be concluded that 41% of the initiative variables contribute and have a significant effect on farm performance/business performance.

c. Goodness of Fit

The next structural model evaluation is to evaluate the GoF (Goodness of Fit) which can be seen based on the fit models such as Average Path Coefficient (APC), Average R-squared (ARS), Average Adjusted R-squared (AARS), Average VIF (AVIF), Average Full Collinearity VIF (AFVIF), Tenenhaus Goodness of Fit (GoF), Sympon's Paradox Ratio (SPR), R-squared Contribution Ratio (RSCR), Statistical Suppression Ratio (SSR), and Nonlinear Bivariate Causality Direction Ratio (NLBCDR)[5]. The results of the goodness of fit evaluation can be seen in table 5.

Table 5. Evaluation of Goodness of Fit Model

Model Fit and Quality Indices	Fit Criteria	Result	Explanation
Average path coefficient (APC)	$p < 0.05$	0,271 P=0,010	Fulfilled
Average R-squared (ARS)	$p < 0.05$	0,506 P<0,001	Fulfilled
Average adjusted R-squared (AARS)	$p < 0.05$	0,462 P<0,001	Fulfilled
Average block VIF (AVIF)	Acceptable if ≤ 5 , ideally ≤ 3.3	1,386	Ideal
Average full collinearity VIF (AFVIF)	Acceptable if ≤ 5 , ideally ≤ 3.3	2,192	Ideal
Tenenhaus GoF (GoF)	Small ≥ 0.1 , medium ≥ 0.25 , large ≥ 0.36	0,607	Large
Sympon's paradox ratio (SPR)	Acceptable if ≥ 0.7 , ideally =1	1,000	Ideal
R-squared contribution ratio (RSCR)	Acceptable if ≥ 0.9 , ideally =1	1,000	Ideal
Statistical suppression ratio (SSR)	Acceptable if ≥ 0.7	1,000	Ideal
Nonlinear bivariate causality direction ratio (NLBCDR)	Acceptable if ≥ 0.7	1,000	Acceptable

Source: Primary Data Processed (2022)

Table 5 shows that all models of fit and quality indices meet the criteria. If the Goodness of Fit test has met the criteria of $P < 0.05$, Average path coefficient (APC) with a value of 0.271 ($P = 0.010$), Average R-squared (ARS) is 0.506 ($P < 0.001$), Average adjusted R-squared is 0.462 ($P < 0.001$), Acceptable if ≤ 5 , ideally ≤ 3.3 with an Average block value of VIF (AVIF) which is 1.386, Average full collinearity VIF (AFVIF) is 2.192, Tenenhaus GoF (GoF) ≥ 0.36 which is 0.607, Acceptable if ≥ 0.7 , ideally 1 with Symson's paradox ratio (SPR) value of 1.00, Acceptable if ≥ 0.7 , ideally 1 with R-squared contribution ratio (RSCR) value of 1.00, Acceptable if ≥ 0.7 with Statistical value suppression ratio (SSR) of 1.00 and Nonlinear bivariate causality direction ratio (NLBCDR) of 1.00, it can be concluded that the index of goodness of the relationship between latent variables (inner model) is said to be good.

3.2.3 SEM-PLS Analysis Model (Path Diagram)

a. Measurement Model (Outer Model)

The results of the flow chart or path diagram if formed into an equation become as follows.

Table 6. Measurement Results (Outer Model)

Variable Type	Research Variable	Equation
Exogenous	Initiative (X1)	$X_{11} = 0,822\xi_1 + \delta_1$
		$X_{12} = 0,670\xi_1 + \delta_2$
		$X_{13} = 0,808\xi_1 + \delta_3$
	Dynamic (X2)	$X_{14} = 0,540\xi_4 + \delta_4$
		$X_{21} = 0,888\xi_2 + \delta_5$
		$X_{22} = 0,874\xi_2 + \delta_6$
		$X_{23} = 0,466\xi_2 + \delta_7$

Variable Type	Research Variable	Equation
Endogenous	Leadership (X3)	$X_{31} = 0,874\xi_3 + \delta_8$
		$X_{32} = 0,931\xi_3 + \delta_9$
		$X_{33} = 0,881\xi_3 + \delta_{10}$
	Collective bargaining (X4)	$X_{41} = 0,918\xi_4 + \delta_{11}$
		$X_{42} = 0,907\xi_4 + \delta_{12}$
		$X_{43} = 0,862\xi_4 + \delta_{13}$
Farming Performance (Y1)	$Y_{11} = 0,965\eta_1 + \varepsilon_1$	
	$Y_{12} = 0,965\eta_1 + \varepsilon_2$	

Source: Primary Data Processed (2022)

b. Structural Model (Inner Model)

$$\eta_1 = -0,41\xi_1 + 0,24\xi_2 + 0,21\xi_3 + 0,23\xi_4 + \zeta$$

3.3 Hypothesis Test Results

The main hypothesis determined in this study is to determine the effect of sustainable supply chain management on sustainable supply chain performance, hypothesis testing is carried out using the WarpPLS software application. The decision rule for hypothesis testing is carried out if the p-value of 0.10 is obtained, then it is said to be weakly significant, if the p-value is 0.05, it is said to be significant and if the p-value is 0.01, it is said to be highly significant. The results of the path coefficient and p-value can be seen in the following table.

Table 7. Path Coefficient and P-value

Hypothesis	Variable	Path Coefficients	p-values	Influence
H1	Initiative – Farm performance	0.407	<0.001	Received, highly significant
H2	Dynamic – Farming Performance	0.236	0.037	Received, Significant
H3	Leadership – Farming Performance	0.211	0.056	Received, Significant
H4	Collective bargaining - Farming Performance	0.230	0.041	Received, significant

Source: Primary Data Processed (2022)

Based on the results of hypothesis testing presented in table 7, all variables have a significant effect on farm performance. This can be seen from the significance criteria determined using a p-value <0.1 (alpha 10%) is said to be significant. The category shows the strength or weakness of a relationship between variables. The variable that has the largest positive and significant effect on farm performance is initiative (X1) with a path coefficient of 0.407 and p-value <0.001. In the farm business, farmers who take initiative will quickly establish themselves as a valued member of the team, which is also likely to lead to future success. For example, to show initiative often presents itself as someone spotting and taking advantage of opportunities those others might have missed. Initiative has to do with proactive which refers to creating or controlling situation rather than simply waiting to see what happens. Another thing showed in the interview was, there were basically two major farm operating objectives, profit maximization on market oriented rice farming and also household sustenance on subsistence-oriented farms. As a result, these kinds of farmers are the people who are thought of for income rises and development opportunities. Thus, since most farmers knew well their goal related to sustainable farming, it is believed that both of reasons made this trait highly significant to the farming performances.

Some practical activities that showed the initiatives of rice farmers in Wuluhan village are:

1. Coping with climate change, soil erosion and biodiversity loss.
2. Satisfying consumers' changing tastes and expectations. This can be shown by the behavior of changing the variety of rice until the farmers knew which kind of rice that were mostly sold in the market.
3. Investing in farming productivity

4. Adopting and learning new technologies.

In addition, the variables that contribute positively and significantly are dynamic (X2) with a path coefficient of 0.236 and a p-value of 0.037 and collective bargaining (X4) with a path coefficient of 0.230 and a p-value of 0.041. Being dynamics in the farming business are important because they impact creativity, productivity and effectiveness. Since group work is integral to organizations, improving group dynamics can lead to better work outcomes and an improved bottom line. While dynamics trait has to do with better output, Collective bargaining is the process in which negotiate contracts are carried out. In this research, this can be described as activities that include payment method in selling, benefits, determining labor working hours, ways to balance work and family, and more.

Meanwhile, another trait such as leadership (X3) also has a positive and significant path coefficient of 0.211 with the highest p-value among the others amounted of 0.056. In this area, farmers tends to face a different operating environment. Interesting findings shows that some implications related to this are: Firstly, farmers in the research area treat everyone with the same respect. They believe that managing farm is not easy because it requires the help of others. Therefore, they agree that every agricultural activity requires good communication and coordination so that all processes run smoothly. Secondly, it can be clearly seen that they always empower others. Not only their workers as team in the farm business, but also when it comes to farming group. Thirdly, they believe that managing a farm will not possible without making plan. Although it can be seen that the plan is on their mind, but most respondent agree that every day is a learning opportunity for increasing the skill and potential.

4. Conclusion and recommendation

Entrepreneurship includes initiative (X1), dynamic (X2), leadership (X3), and collective bargaining (X4). The initiative variable (X1) has the highest path coefficient among other variables, which means that the level of initiative owned by farmers will significantly determine the farm's performance. In addition, farmers are also determined to have a dynamic nature and desire to move forward together following the development of the farming system so that they can maintain or even improve their agricultural performance. Although it does not have a more significant influence than other variables, the leadership spirit possessed by farmers can also improve the performance of the agricultural sector. Therefore, government efforts and farmers' self-awareness are needed to improve these entrepreneurial factors for better farming performance.

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