Government's roles impacts the entrepreneurial orientation of rice farmers

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Abstract. Farmers' entrepreneurial orientation needs to be improved to maximize the agricultural sector. The government's role is needed in optimizing existing facilities in the agroecosystem to make it easier for farmers to do farming. The purpose of this study was to analyze the effect of agroecosystems on the entrepreneurial orientation of rice farmers. A total of 200 respondents were taken by purposive sampling. Then analyzed with the PLS-Structured Equation Model. The results showed that the role of government policy had a significant positive effect on the entrepreneurial orientation of farmers, where it had a stronger effect on irrigated rice fields. Mainly, government support for the provision of agricultural tools and machinery (ALSNTN) has been proven to improve the entrepreneurial orientation of farmers, while institutional support for rainfed rice is the thing that most influences the entrepreneurial orientation of rain-fed rice farmers.

1. Introduction

The study of entrepreneurial orientation attitudes that have been carried out has only focused on large-scale business actors and it has been proven intensively that the bigger a business is due to the better their entrepreneurial orientation attitude. However, even small business actors have an entrepreneurial orientation, as is the case with farmers, where in the farming process, they are also innovative, proactive and dare to take risks to achieve their farming goals [1]. So, farmers can also be called farm entrepreneurs.

Farmers are called entrepreneurial oriented if in their farming processes and activities they can make decisions that can encourage their farming development by striving to take advantage of available resources through innovativeness, take advantage of changes and trend developments and see consumer preferences as business opportunities, find new opportunities in the middle of competition known as a proactive attitude, and dare to take risks to develop their farming. A farmer needs to have an entrepreneurial orientation to develop his farm. The knowledge and ability of farmer organizations will be more developed with an innovative, creative and risk-taking attitude [2]. However, agroecosystems are one of the obstacles in developing the entrepreneurial orientation of farmers in Indonesia [3], where an agroecosystem is strongly influenced by local policy and cultural factors which can be both a supporting factor and an inhibiting factor for a business [4].

The role of government policies in the provision of agricultural machinery, irrigation, production, and loan facilities, as well as training and counseling is needed in facilitating farmers in doing
business. Different roles of government in an agroecosystem will provide different resources have an impact on decision making and the actions of farmers in entrepreneurship.

Irrigated rice fields are still an important focus of the government. The availability of facilities that can support increased agricultural productivity directs farmers to a monoculture rice cropping system, where farmers only plant rice every planting season. Thus, indicating that the availability of agricultural supporting facilities by the government will cause farmers to tend to be static in looking for the latest agricultural information, and also impacting the attitude of innovativeness and farmers' reluctance to take risks.

The existing agricultural development policy in the irrigation area will cause farmers to think that irrigated rice fields are only intended for rice cultivation. Lack of entrepreneurial orientation and farmer management towards the facilities provided by the government as well as a lack of experts and strong sociocultural influences are factors that underlie farmers to only plant rice commodities. So it has an impact on the attitude of farmers who do not dare to act, think creatively and innovatively, and are afraid to take risks in managing their farms.

There needs to be a deeper analysis of the effect of agricultural development programs issued on a rice field agroecosystem on farmers' innovativeness, proactivity, and the courage of farmers in taking risks. It is hoped that this study can provide information about the entrepreneurial orientation of farmers in rice fields agroecosystems. Based on this description, the researcher is interested in digging deeper into the entrepreneurial orientation of farmers in two agroecosystems. This research was conducted on land-owning farmers who cultivate irrigated and rainfed lowland agroecosystems, where the intended agroecosystem refers to government policies that have been realized. The model to be built in this study is limited to entrepreneurial orientation which consists of three elements, namely innovativeness, proactivity, and the courage of farmers to take risks in each rice field area.

2. Research methods

2.1. Data and instruments

The data collection method was conducted by survey method. This study uses two data sources. Primary data was obtained through a questionnaire. Secondary data as additional and supporting data are obtained through literature studies by studying literature from journals, books, theses, reports, the Central Bureau of Statistics, the Agricultural Service, BAPPEDA, and all possible sources related to agroecosystems and entrepreneurial orientation. Data collection through interviews was conducted in the form of direct interviews with farmers, farm families, and key informants in each rice field area. Alternative answers will be adjusted to a Likert scale which is made into five alternative answers. Each measurement variable is indicated by a statement where each statement in the questionnaire is given a scale using a Likert scale 1-5 with the following explanation:

1 = Strongly Disagree
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly Agree

2.2. Data analysis method

The sample was taken by purposive sampling technique. It was taken from districts that have almost the same area of irrigated and rainfed rice fields, where 2 districts were selected as research locations, namely Pancarijiang District (1871 km²) and Kulo District (1819 km²). The number of samples taken was 200 respondents, 100 respondents to irrigated rice farmers in Pancarijiang District, and 100 respondents to rainfed rice farmers in Kulo District, based on the minimum sample size requirements for Structural Equation Modeling (SEM) analysis tools. Calculation (n) x 5 observations for each estimated parameter [5].

The collected data is then processed using Structural Equation Modeling (SEM) analysis using Partial Least Square software. The important reason underlying the use of SEM is because it can
estimate the relationship between variables that are multiple relationships. Using SEM analysis can also determine the form of the relationship pattern between the latent constructs and the manifest variables. The use of SEM analysis makes it possible to confirm and exploratory the model so that it can be used for research purposes, theory testing, and theory development. There are several stages in the use of the Structural Equation Model (SEM) according to Bollen and Long 1993 [5], namely: (1) Model specification, (2) Identification, (3) Estimation, (4) Fit Test, (5) Respecification. The data obtained through research first goes through a scoring and coddng process [5]. Coddng is the process of giving a code or symbol to each category of respondent's answer to simplifying the respondent's answer in the form of a particular symbol or code to make it easier to analyze. Scoring includes the process of simplifying the respondent's answer which is made consistent in the ordinal form for each answer to the question. SEM is also able to show unobserved concepts and the relationships that exist in them. The components in the SEM model consist of:

1. Two types of variables, namely latent and manifest variable
2. Two types of models, namely structural and measurement models.
3. Two types of errors, namely structural and measurement error.

**Figure 1.** Research model on the influence of agroecosystems on farmer entrepreneurial orientation

Latent variable (unobserved variable) is a variable that cannot be directly observed, this variable can be observed with the help of the indicator variable (manifest). The latent variables is represented as a round or ellipse, while symbol box is represented measure observed variable. Part of SEM consists of confirmatory factor analysis, path analysis, and regression.

| Table 1. Description about manifest variables |
|-----------------------------------------------|
| **Agroecosystem (LING)** | **Description** | **Sources** |
| Availability of agricultural machine tools assistance (ALSNTN) | Availability of agricultural machinery in the form of tractors, transplants, electric sprayers and harvesting machines | Chandramouli *et al.* 2005; Veidal & Flaten 2014; Arisena *et al.* 2014 |
| Availability of assistance for irrigation facilities (PGRN) | Availability of assistance for irrigation facilities such as irrigation assistance and pumps | |
| Availability of seed assistance (BNHSUB) | Accuracy of quantity, type, quality and time in obtaining seeds | |
| Availability of fertilizer assistance (PPKSUB) | Ketepatan jumlah, jenis, mutu dan waktu dalam The accuracy of the amount, type, quality and time in obtaining fertilizer | |
Availability of agricultural information (INFRS)  
It is easy to obtain information about inputs, cultivation technology and markets.

Training on agriculture (PLTHN)  
The frequency and intensity of training followed regarding agriculture in the first cycle of the growing season.

Institutional support (DKGLB)  
There are institutions that support the cultivation process to marketing for farmers.

Availability of loan facilities (FSPMJ)  
The existence of lending facilities, both in the form of money and goods, originating from outside.

Entrepreneurship Orientation (Orientasi)  

Innovativeness (INOV)  
The ability of farmers who are open to new things, trying to find out about things that are considered new about farming that is carried out in terms of products, processes, technology and markets.

Proactive (PROAK)  
The ability of business actors to seek opportunities and seize opportunities, show initiation, be responsible for taking action and take all necessary steps to run a business.

Taking Risk (RESIKO)  
The ability of business actors to take business risks by knowing the opportunities for success and failure in running their business.

Selection of variables based on theory or previous research, where agroecosystem variables are the result of exploration of existing agricultural development programs in both irrigated and rainfed rice fields, in the form of farm machine availability, irrigation facilities, availability of seed assistance, fertilizers, agricultural information, support for agricultural training. Institutions and the availability of loan facilities which are part of the environment. This environment will affect entrepreneurial orientation and thus have an impact on the performance of farmer farming. As in Gunarto's [6] which states that the environment (government and policies; economy; resources and services; product, market, and demand; competition; technology) has a direct negative effect on business performance but has an indirect positive effect through entrepreneurial orientation as a variable intervening. The entrepreneurial orientation variable was adopted from Covin & Slevin [7] who succeeded in simplifying the characteristic theory pioneered by Miller [8] by defining entrepreneurial orientation which is a process, structure, and company behavior characterized by innovativeness, proactivity, and risk-taking. These three dimensions have been studied and extensively accepted in various entrepreneurial orientation studies.

3. Results and Discussion

Sidenreng Rappang Regency with the capital city of Pangkajene as one of the rice production centers in South Sulawesi is located 183 Km to the north of Makassar (Capital of South Sulawesi Province) with an area of 1,883.25 Km². The topographical condition of most of the area is low land, so this area is very suitable for the development of the agricultural sector, especially rice, which is a sector which is a leading sector that drives the economy in the development of the Sidenreng Rappang Regency area.

The entrepreneurial orientation research on irrigated and rainfed rice farmers was carried out in two sub-districts, namely Pancarirjang and Kulo in Sidrap Regency. The agricultural sector is the main supporter of the economy of Pancarirjang District and Kulo District. The development of the agricultural sector, which is reflected in the development of agricultural production, greatly affects the economy of the people.
These two sub-districts were selected based on almost the same area of rice fields where Pancarajiang District has an area of 1467 km$^2$ of irrigated rice fields while Kulo District has an area of rainfed rice fields of 1456 km$^2$. The similarity in the size of the rice fields owned is the scope of research that will make it easier for researchers to compare the entrepreneurial orientation of farmers. Respondent farmers are farmers who own the land where most of the farmers own land of 0.6-1 hectare. These farmers are generally still of productive age. In contrast, farmers with more than one hectare of land use from 51 to 60 years. The age difference can be one of the factors that influence farmer decision making. Farmers who have been farming for a long time are generally reluctant to make changes in their farming activities, especially irrigated farmers. It is different for rainfed lowland farmers who are faced with higher risks, especially in terms of technology. Rainfed rice farmers are more courageous in choosing what commodities they plant. These farmers can plant a variety of commodities by market demand. However, there are still many farmers who only plant commodities programmed by the government. They have to face small yields to harvest failure.

3.1. Farmer Entrepreneurial Orientation Measurement Model.
Analysis of the measurement model is a step to ensure that the variables used in this study are valid. The measurement model in SEM is to measure the closeness relationship between latent variables and manifest variables. The value of the closeness of the relationship between these variables can be seen from the loading factor value. The greater the loading factor value between the manifest and latent variables, the more it shows the closeness between these variables. The conditions that must be met in building a good model with SEM are the $t$-value $\geq 1.96$ while the limit of the loading factor value is $\geq 0.5$ indicating that the variable is significant [5]. Variables that show a loading factor value $<0.5$ are declared invalid and can be eliminated through model recognition. A low validity will result in data that is not relevant to the measurement objectives [9]. The following is an initial SEM measurement model.

| Latent Variables                  | Manifest | Irrigation | Rainfed |
|----------------------------------|----------|------------|---------|
|                                  | \(\lambda\) | \(t\)-value | \(\lambda\) | \(t\)-value |
| Agroecosystem (Ling)             |          |            |         |
| ALSNTN                           | 0.88     | 4.05       | 0.51    | 3.54       |
| PGRN                             | 0.69     | 2.53       | 0.19    | 0.23       |
| BNHISUB                          | 0.03     | 0.13       | 0.68    | 4.19       |
| PPKSUB                           | 0.51     | 0.22       | 0.5     | 3.31       |
| INFRS                            | 0.27     | 1.98       | 0.72    | 0.5        |
| PLTHN                            | 0.71     | 2.7        | 0.66    | 5.27       |
| DKGLB                            | 0.76     | 1.95       | 0.81    | 2.47       |
| FSPMJ                            | 0.08     | 0.11       | 0.07    | 0.65       |
| Entrepreneurial Orientation (Orientasi) |          |            |         |
| INOV                             | 0.68     | 48.24      | 0.56    | 23.77      |
| PROAK                            | 0.77     | 18.41      | 0.88    | 12.71      |
| RESIKO                           | 0.62     | 52.54      | 0.69    | 31.26      |

Note: if \[\lambda \geq 0.5; t\)-value $\geq 1.96\] it is significant

Table 2 shows the validity of the different manifest variables. In irrigation agro-ecosystems, there are three manifest variables that are invalid describing the latent variables, namely the variable availability of subsidized seeds, the availability of agricultural information and the availability of loan facilities provided by the government. Meanwhile, for rainfed agroecosystems, there are two invalid variables, namely the availability of irrigation facilities and the availability of loan facilities. So it is necessary to
have a respecification based on the theory underlying the research modified and tested again with the same data. The following is the result of the respecification of the agroecosystem influence model on the entrepreneurial orientation of farmers.

**Table 3. Respecification model of the influence of agroecosystems on the entrepreneurial orientation of farmers**

| Latent Variables          | Manifest | Irrigation | Rainfed |
|---------------------------|----------|------------|---------|
|                           |          | $\lambda$ | $t$-value | $\lambda$ | $t$-value |
|                           | ALSNTN   | 0.94      | 11.63    | 0.52      | 7.30      |
|                           | PGRN     | 0.70      | 10.02    | -         | -         |
|                           | BNHSUB   | -         | -        | 0.68      | 8.84      |
|                           | PPKSUB   | 0.50      | 7.76     | 0.53      | 6.62      |
| Agroecosystem (Ling)      | INFRS    | -         | -        | 0.64      | 7.72      |
|                           | PLTHN    | 0.58      | 5.03     | 0.66      | 8.69      |
|                           | DKGLB    | 0.83      | 11.10    | 0.71      | 9.53      |
|                           | FSPMJ    | -         | -        | -         | -         |
| Entrepreneurial Orientation (Orientasi) | INOV   | 0.74      | 7.74     | 0.56      | 8.16      |
|                           | PROAK    | 0.67      | 4.80     | 0.74      | 3.72      |
|                           | RESIKO   | 0.82      | 4.06     | 0.87      | 3.62      |

Note: if $\lambda \geq 0.5; t$-value $\geq 1.96$ it is significant

The results of model respecification show that there are three invalid environmental manifest variables in irrigated rice fields, namely the availability of subsidized seeds, agricultural information, and the availability of loan facilities. Meanwhile, in rainfed rice fields, there are variables of irrigation facilities and the availability of invalid loan facilities. The availability of subsidized seed assistance (BNHSUB) cannot be a variable measuring the irrigation agroecosystem. Irrigation farmers responded that it was true that there was seed assistance, but the frequent delays in seed distribution caused irrigation farmers to be less dependent on subsidized seeds and choose to become seed breeders, buy seeds at the nearest kiosk or buy from farmers who breed in their area, this is a variable is invalid in measurement. This is different from the respondents in rainfed rice fields who still depend on the seeds distributed by the government. Delays in seed distribution often interfere with their farming activities.

The variable availability of agricultural information (INFRS) shows the information on input, technology, and capital obtained by respondents. INFRS in irrigated rice fields does not significantly reflect agro-ecosystem. This is because irrigated rice field respondents get more information from farmers across districts and even the mass media. In general, agricultural information provided by the government has already been known by farmers through other media. In contrast to the positive significant rainfed respondent farmers (0.64) who obtained a lot of information on input and technology from the agriculture agency, but still complained about the lack of market information for the commodities they planted.

The invalid variable in rainfed rice fields is the variable of availability of irrigation facilities (PGRN) which is usually facilitated by the government in the form of assistance for the construction or repair of irrigation channels, provision of water pumps, and construction of drilling wells. Most of the rainfed respondent farmers did not receive irrigation assistance from the government because they had already taken the initiative to build boreholes and purchased water pumps. In contrast to irrigated rice farmers, irrigation facilities reflect the agroecosystem (LING) of 0.70 and significant with a $t$-value of 10.02. This can be seen from the frequent government assistance in the form of repairing
irrigation channels and additional water pumps to fill the land because the short irrigation canals cannot inundate the entire land.

Other manifest variables are declared valid in measuring their constructs. Likewise, the variable for irrigated rice fields is significantly reflected by the availability of agricultural machinery (ALSNTN) provided by the government with a t-value of 11.63 and a loading factor of 0.94 (Table 2). The government's attention to the provision of agricultural machine tools is very helpful for the farming of respondent farmers. Generally, the assistance is in the form of tractors, trans plants, and harvesting machines.

Variable availability of subsidized fertilizer assistance (PPKSUB). Based on the results of the analysis on both irrigated and rainfed agro-ecosystem respondents, it was found that the availability of fertilizer by the government had been implemented properly and responded by respondents in assisting the farming process. Subsidized fertilizers have been well distributed in terms of quantity, type, and quality, although sometimes they still experience delays in distribution, this does not interfere with the fertilization time.

The training and extension variables (PLTHN) significantly reflect irrigated and rainfed agroecosystems. Respondents in the irrigation area admitted that they sometimes received guidance and counseling. However, the lack of up-to-date materials and information provided during the extension activities causes some farmers to be less interested in participating in addition that the location of the guidance activities is sometimes far from their access.

The institutional support variable (DKGLB) reflects the agro-ecosystem in both irrigated and rainfed areas. Respondents generally often receive support from farmer groups, farmer group associations, and cooperatives in the form of funds, products, and services. Service assistance is the thing most respondents get from these institutions. Like at the beginning of planting and harvesting.

The latent variable of entrepreneurial orientation is reflected by three manifest variables, namely innovativeness (INOV), proactive (PROAK), and the courage to take risks (RISK). Innovation refers to the tendency to abandon existing practices and use new technologies by using resources efficiently [10]. It can be seen in Table 3 that the innovativeness of the irrigation respondents is higher than that of the rainfed respondents. Irrigation respondents made more innovations in the form of using the latest agricultural machinery such as using harvesting machines and even transplants and often trying new types of fertilizers and pesticides compared to rainfed respondents. The proactive variable significantly reflects the entrepreneurial orientation of both irrigated and rainfed farmers. However, rainfed farmers are more initiative and active in seeking opportunities and information (0.74). While the risk-taking in this study describes the risk of production, technology risk, and financial risk. Irrigation respondent farmers are more willing to take risks than rainfed farmers. This variable significantly reflects the entrepreneurial orientation of farmers in both regions.

3.2. Structural Model Analysis of Influence Between Latent Variables.
Structural model analysis in SEM aims to explain the causal relationship between latent variables by examining the significance of the latent variables estimated through-loading factors, with a maximum value of 1 and the significance of the t-value ≥ of 1.96 for each coefficient [5].

| Hypothesis | Loading Factor | T-value |
|------------|----------------|---------|
|            | Irrigation     | Rainfed | Irrigation | Rainfed |
| LING --> ORIENTASI | 0.47 | 0.36 | 10.06 | 9.06 |

Note: if [t-value ≥ 1.96] then it is significant

The structural model obtained explains the effect of the agroecosystem (LING) on entrepreneurial orientation (ORIENTATION). The irrigated agroecosystem has an effect of 0.47 on the entrepreneurial orientation of farmers, while for rainfed rice farmers it is only 0.36. In line with the research of [11] that the environment has a positive influence on the relationship between
entrepreneurial orientation and business performance. This study confirms the research conducted by Chandramouli et al. (11) that there are differences in innovativeness and risk taking in farmers who manage their farms on irrigated and dry land, due to differences in resources such as irrigation assistance, technology, and management services on both lands.

The influence of agroecosystems on entrepreneurial orientation appears to be greater for irrigated farmers. Existing government assistance to irrigated agroecosystems has more influence on the entrepreneurial orientation of farmers, especially on the availability of agricultural machinery assistance [12]. The availability of agricultural tools and machine (ALSNTN) obtained by irrigation rice farmers has been able to improve their entrepreneurial orientation attitudes, especially in their innovative attitudes (0.74). The existing technology assistance enables farmers to try the newest technology available. This is a form of innovation, according to Zimmerer [13], innovativeness is seen not only as a result of creation but a change in methods, processes, and new tools used as a form of innovation.

Meanwhile, the influence of agroecosystems on rainfed farmers is dominated by institutional support variables (Table 4) which mean that institutional support plays an important role for farmers to increase their innovation, to be more active in seeking information and seizing opportunities, and to increase their courage in taking risks. The existence of institutional support makes it easier for farmers to obtain agricultural information [14]. Government intervention conducive to farmers’ agroecosystems in both irrigated and rainfed rice fields is still very much needed to improve the entrepreneurial orientation of farmers.

4. Conclusion and Recommendation

4.1. Conclusion

The existence of government support in providing facilities has a positive and significant effect on the entrepreneurial orientation of farmers in irrigated and rainfed. The farmers in irrigated rice fields are more likely to improve their entrepreneurial orientation compared to rainfed farmers and have an impact on improving farmer performance perspectives. This is inseparable from greater government support for irrigated rice farmers in providing agricultural machinery, irrigation facilities, fertilizers, training, and institutional support that can help farmers cultivate crops. The results of this study indicate that the more conducive the role of the government is in optimizing an agroecosystem, the more it will increase the entrepreneurial orientation of farmers and have an impact on improving their farming performance.

4.2. Recommendation

Based on this research, it can be concluded that suggestions for farmers, extension workers, and the government that support the improvement of the entrepreneurial orientation of rice farmers are as follows:

- The role of the government is still very much needed in encouraging farmers to increase their entrepreneurial orientation through the availability of agricultural information, adequate facilities, and infrastructure as well as things that need to be considered by the government so that farmers can be motivated in farming.

- The government needs to improve the distribution of subsidized seeds to make it more targeted, on time, right in quantity, right in type, and quality. Because this still disturbs rainfed rice farmers who grow rice commodities. It is different for irrigated rice farmers who have taken other alternatives in obtaining seeds and do not depend on government subsidized seeds. Regarding the availability of agricultural information, irrigated rice farmers do not get a lot of agricultural information from extension workers because the information provided by extension agents is something that has already been known by farmers from social media or cross-district farmers, so it is necessary to improve the quality of agricultural extension agent, through seminars as well as training.
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