

Perception Of Farmers On The Innovation Of Legowo Jajar System In Padang City

(Case Study in Sungai Sapih Village Kuranji District Padang City West Sumatra Province)

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Abstract – This study aims to describe the characteristics of rice farmers who implement the Legowo Jajar System in Padang City and Describe farmers' perceptions of the Legowo Jajar System in Padang City. The method used in this study is a qualitative descriptive method with the type of survey. The results of research on rice farmers' perceptions of the innovation of the legowo jajar system in Padang City can be concluded that rice farmers who apply the legowo jajar system to the Setia Budi farmer group have a productive age category, the level of education is mostly high school graduation, the area of land owned by farmers ranges from 0.25 - 1.25 Ha, land ownership status is mostly arable land and with an average experience of 49 years. Farmers' perceptions of the implementation of the legowo jajar system in the Setia Budi farmer group in Padang City were negative. In the labor category, the number of inputs used, costs used and results obtained were needed more in the application of the legowo row system than conventional systems.

Keywords – Farmer perception, Jajar legowo system, Innovation.

I. INTRODUCTION

Agriculture aims to fulfill human food needs. Food is an important and strategic commodity because food is a basic human need whose fulfillment is the human right of every Indonesian as stated in Law No. 7 of 1996 concerning Food [19]. The population that always increases every year demands the availability of food in large quantities, to achieve food availability, a modern agricultural system can be used.

Agricultural technology experiments carried out by the main actors, as a follow-up to the results of the assessment/testing of recommended technologies, technologies explored from the main actors or from various other technology sources, to obtain technology that suits the needs/location of the main actors.

Kuranji sub-district under the auspices of Nanggalo Agricultural Extension Office (BPP) is a pilot site, one of the selected villages to implement the Jajar Legowo system in paddy rice is Sungai Sapih village. Of the 22 farmer groups, one farmer group, the Setia Budi Group, was selected as the pilot site in Padang City. The first reason for selecting the Setia Budi farmer group is because in 2019, the Padang City Government selected the Setia Budi farmer group by asking all group members to conduct experiments using a new variety, namely bujang marantau with the jajar legowo system. The second reason is the strategic location of the rice field and its easy accessibility, making it easier for other farmers to see the Jajar Legowo system.

The West Sumatra Agricultural Technology Assessment Center (BPTP) selected 10 of the 37 members of the Setia Budi farmer group to participate in the Jajar Legowo system. In fact, not all members of the Setia Budi farmer group could accept and apply the Jajar Legowo system to their rice fields. After the field study, only 2 group members applied the jajar legowo system and only once in one planting season. Afterwards, all members of the Setia Budi farmer group returned to using the conventional planting system. This caused each team member to have a different perception of the Jajar Legowo system.

Based on the formulation of the problem, the research objectives to be achieved are:

(1) Describe the characteristics of rice farmers who apply the Jajar Legowo System in Padang City (2) Describe farmers' perceptions of the Jajar Legowo System in Padang City.

II. LITERATURE REVIEW

Perception is a process by which individuals organise and interpret their impression responses with the intention of giving meaning to their environment, but what we perceive can differ substantially from objective reality. Perception is the process of receiving information, making sense of the world around us. It requires consideration of which information to pay attention to, how to interpret it within the framework of our existing knowledge [18].

According to Irwanto, 2002 in [7], after individuals interact with perceived objects, the results of perception can be divided into two, namely positive perceptions where this perception describes all knowledge (whether or not they know or know) and responses that are continued with efforts to use them. It will continue with activeness or acceptance and support for the perceived object. The second is negative perception, this perception describes all knowledge (whether or not you know it) and responses that are not in line with the object being perceived. It will continue with passivity or reject and oppose the perceived object

Innovation as new ideas, new practices, or objects that can be perceived as something new by individuals or target communities. The definition of new here, implies that it is not just new to the mind, but also new because it has not been widely accepted by the entire community in terms of attitudes and is also new in the sense that it has not been accepted and applied by all members of the local community [13]

The jajar legowo rice planting system is also an effort to manipulate the location of the plant so that the plant will have a greater number of edge plants with empty rows. As it is known that rice plants on the edge have better growth and development than rice plants in the middle row so as to provide higher and better grain production and quality. This is because the plants on the edge will get more sunlight intensity as an effect of the edge plants [9]. The legowo planting system is a way of planting rice fields with a pattern of several rows of plants interspersed with one empty row. Plants that should have been planted in empty rows are moved as insert plants in rows. Then interspersed by 1 empty row where the planting distance on the edge row is 1/2 times the distance of plants in the middle row. How to plant legowo rows for rice fields, in general, can be done with various types, namely: legowo (2: 1), (3: 1), (4: 1), (5: 1), (6: 1) or other types.

III. RESEARCH METHODS

This research was conducted in Sungai Sapih Village, Kuranji District, Padang City, West Sumatra Province, the object of this research is the "Setia Budi" farmer group that follows the activities of the jajar legowo system. This research was conducted for one month and started from February 24, 2022 to March 24, 2022. The basic method used in this research is descriptive method with survey type [10]. The data used are primary data and secondary data.

The population in this study amounted to 37 people who are members of the farmer group "Setia Budi" which is divided into 2 people who apply during the activities of the study and after the activities of the study of the jajar legowo system, 8 people who apply during the activities of the study of the jajar legowo system and 27 people who do not apply at all jajar legowo system. Data analysis for the first objective, describing the characteristics of rice farmers who participated in the Jajar Legowo System application review program in Sungai Sapih Village, used descriptive analysis. For the second objective, knowing the perception of farmers towards the Jajar Legowo System in Sungai Sapih Village, Kuranji District, Padang City was analyzed descriptively qualitatively using the Likert scale in [15].

IV. RESULTS AND DISCUSSION

Farmer Group Setia Budi

The The Setia Budi Farmer Group was initially established in 1991. The basis for the formation of this farmer group was due to the common interests of farmers in farming with the vision of creating the Setia Budi Farmer Group as a movement for agribusiness development and food security. However, over time this group experienced a vacuum because there were no group activities and programs that could be carried out. In 2008, there was a change in the management structure of the Setia Budi Farmer Group. After the change in management, the Setia Budi Farmer Group became active again with the assistance of PPL Field Extension Officers.

The formation of this farmer group was also based on the desire of group members to channel their aspirations in farming and to receive counseling and facilities provided by the government through the Padang City Agriculture Office. The Setia Budi farmer group was established based on the desire of farmers to improve their farms, and to make it easier to get various programs that can support farming activities. The Setia Budi farmer group is currently chaired by Mr. Hadrium, secretary Mrs. Linus, and treasurer Mrs. Nova.

Characteristics of Respondents

To find out the characteristics of respondents can be seen in Table 1.

Table 1. Characteristics of Respondents

| No. | Description | Number (people) | Percentage (%) |
|-----|-------------------------------|-----------------|----------------|
| 1. | Age | | |
| a. | 37-50 | 11 | 30 |
| b. | 51-64 | 16 | 43 |
| c. | 65-78 | 10 | 27 |
| 2. | Farming Experience | | |
| a. | 17-33 | 9 | 24 |
| b. | 34-50 | 16 | 43 |
| c. | 51-67 | 12 | 33 |
| 3. | Education | | |
| a. | Did not finish school | 8 | 22 |
| b. | Elementary school/equivalent | 5 | 14 |
| c. | Junior high school/equivalent | 9 | 24 |
| d. | High school/equivalent | 15 | 40 |
| 4. | Land Area (Ha) | | |
| a. | 0,1-0,49 | 2 | 5 |
| b. | 0,5-0,99 | 15 | 41 |
| c. | 1- 2 | 20 | 54 |
| 5. | Land Ownership Status | | |
| a. | Owned | 18 | 49 |
| b. | Cultivated Land | 19 | 51 |

Source: primary data

Age

Based on Table 1, it can be seen that the productive age of respondent farmers in the age range of 37-50 years, namely 11

people (30%) and age 51-64 years, namely 16 people (43%). The average respondent farmer is at a productive age of 56 years, with the youngest age variation of 37 years and the oldest age of 77 years, which means having the willingness to apply a new innovation and very likely in an effort to increase productivity through farming skills.

Age in farming activities affects the acceptance of innovations and the physical ability to carry out farming activities. According to [2] based on population composition, age is grouped into 3 categories. Age below 15 years is considered to be at an unproductive age, age 15-64 years is considered to be at a relatively productive age, and age 65 years and over is considered to be at an age that is no longer productive. Based on the age classification that refers to the BPS Central Bureau of Statistics, it can be seen that most of the sample farmers are in productive age, this condition indicates that farmers are physically able to carry out farming activities properly. Farmers of productive age have a higher ability to think and work than farmers who are not productive.

Farming Experience

Based on Table 1, the average farmer has 49 years of farming experience which is included in the old category. With a percentage of 43%, the average respondent farmer is long enough in farming that already has better knowledge (both in terms of technical cultivation and in terms of economics) about farming. So that farmers are easier to run their farms and easier to overcome the problems encountered in farming.

The farming experience of a farmer will indirectly affect the farmer's mindset. Farmers with longer rice farming experience will be able to plan their farms better because they already know all aspects of rice farming. The longer the experience gained, the lower the various agricultural risks, the higher the yield and the more income from farming. According to [8], farming experience is divided into 3 categories, namely less than 10 years including the new category, ages 10 to 20 years including the medium category and more than 20 years including the old category. The length of time a farmer does farming affects the acceleration of acceptance of innovation.

Education

The level of education is divided into 4 based on the lowest and highest levels of respondent farmers, namely not finishing school, elementary school, junior high school, and high school. From Table 1 it is known that respondent farmers are at the level of education, not finishing school; 22%, elementary school; 14%, junior high school; 24%, high school; 40%. This shows that the level of education of the respondent farmers is still low because in reality the conditions of education, economy and infrastructure and technology in the past are different from the current era, so that the level of education will affect the mindset, behavior and response to information or in making decisions, as well as trying new innovations to carry out agricultural activities to be cultivated.

According to [14], the level of education will affect the thinking patterns of farmers. A relatively high level of education and young age causes farmers to be more dynamic, and the level of education of farmers can affect farmers in introducing and adopting new technology.

Land Area

The land area referred to here is the land area used for farming. Land area will affect the income level of farmers. The results showed that the land area of respondent farmers in the range of 0.1-0.49 Ha by 5%, land area 0.5-0.99 Ha by 41% and land area 1-2 Ha by 54%. According to [17], farmer groups are divided into three, namely rich farmers who have agricultural land areas of more than 2.5 Ha, medium farmers have agricultural land areas ranging from 1 to 2.5 Ha and poor farmers who have agricultural land areas of less than 1 Ha. From Table 1, it can be seen that the average respondent farmer in the study area is mostly around 1 Ha so it is classified as a medium farmer. Because basically the land area affects the income and welfare of farmers, the more extensive the farm land, the higher the production yields that can affect the income of farmers.

Land Ownership Status

According to [6], farmers who cultivate their own land have freedom in managing the land, can plan, and determine the branch of business that is cultivated on the land. Whereas farmers who cultivate sekapan land with a profit-sharing system, all activities and decision-making must be discussed and agreed upon by both parties, namely the cultivator and the landowner.

Farmers who cultivate the sekapan land do not have the right to sell or mortgage it.

Based on Table 1, the category of land ownership status of respondent farmers 49% owned and 51% cultivated land. Based on this, farmers with their own land ownership are easier in deciding to do their farming because they are not burdened with land rental costs than respondent farmers who have cultivated land (profit sharing), this is influenced by the large costs that must be incurred by tenant farmers.

Farmers' Perceptions of the Jajar legowo System in Padang City

Perception is an observation, assessment, and interpretation by someone who is impressed by the object seen and observed so that the person can understand and interpret information in the conditions of the situation and the environment in which it is located and can determine his behavior. Based on the results of interviews with respondent farmers, it can be seen in several aspects, namely:

Farmers' Perception of Labor Use

Farmers' perception of the use of labor is the amount of labor used at the time of seeding to harvesting with jajar legowo rice planting system. For more details can be seen in Table 2.

Table 2. Respondents' Perceptions of the Use of Labor

| Indicator | Alternative Answer | | | Total | Average Total Score |
|--------------------------------------------------------------------------------------------------------|--------------------|--------------|----------------|-------|---------------------|
| | Agree | Undecided | Disagree | | |
| 1. Labor during seeding is less with the jajar legowo system compared to the conventional system | 2 (5,41%) | 1 (2,70%) | 34 (91,89%) | 37 | 1,13 |
| 2. Labor during planting is less with the jajar legowo system compared to the conventional system | 2 (5,41%) | 1 (2,70%) | 34 (91,89%) | 37 | 1,13 |
| 3. Labor during weeding is less with the jajar legowo system compared to the conventional system | 2 (5,41%) | - | 35 (94,59%) | 37 | 1,10 |
| 4. Labor during fertilization is less with the jajar legowo system compared to the conventional system | 2 (5,41%) | - | 35 (94,59%) | 37 | 1,10 |
| 5. Labor during pest control is less with the jajar legowo system compared to the conventional system | 2 (5,41%) | 1 (2,70%) | 34 (91,89%) | 37 | 1,13 |
| 6. Labor during harvesting is less with the jajar legowo system compared to the conventional system | 2 (5,41%) | - | 35 (94,59%) | 37 | 1,10 |
| | | | | | 1,11 |

Source: data processing

Based on the research results that can be seen in Table 2, respondents' perception of the use of labor using the jajar legowo system was found to be negative with an average of 1.11. According to farmer respondents, the use of labor using the jajar legowo system is more than the conventional system. Where for the use of labor during seeding, planting and control of plant pest organisms 91.89% (34 people) of farmer respondents thought that more labor was needed using the jajar legowo system. The use of labor when weeding, fertilizing and harvesting 94.59% (35 people) farmer respondents argue that more labor

is needed with the jajar legowo system.

Based on the discussion of the labor used, the results obtained with a negative perception category, while in [5] research, obtained quite good results, because farmers are willing to accept the latest innovations, namely the jajar legowo planting system, according to farmers using the jajar legowo planting system is very easy to understand and does not require a lot of labor and increases production which has an impact on the increase in the farmer's economy.

Farmers' Perceptions of the Amount of Inputs Used

Farmers' perception of the number of inputs used is the capacity of the number of inputs used including the number of seeds and fertilizers with the jajar legowo rice planting system. For more details can be seen in Table 3.

Table 3. Respondents' Perception of the Number of Inputs in the Jajar Legowo System

| Indicator | Alternative Answer | | | Total | Average Total Score |
|-----------------------------------------------------------------------------------------------------------|--------------------|----------------|----------------|-------|---------------------|
| | Agree | Undecided | Disagree | | |
| 1. The number of seeds used is less with the jajar legowo system compared to the conventional system. | 2 (5,41%) | 9 (24,32%) | 26 (70,27%) | 37 | 1,35 |
| 2. The amount of fertilizer used is less with the jajar legowo system compared to the conventional system | 2 (5,41%) | 13 (35,14%) | 22 (59,46%) | 37 | 1,46 |
| | | | | | 1,40 |

Source: data processing

Based on the research results that can be seen in Table 3, the indicator of the number of seeds used with the jajar legowo system obtained perceptions in the negative category with an average of 1.35. Farmers who disagree as many as 26 people argue that the spacing of the jajar legowo system is too tight which makes the growth of rice panicles inhibited and makes the production of fewer grains. On the indicator of the amount of fertilizer used with the jajar legowo system obtained perceptions in the negative category with an average of 1.46. A total of 2 farmer respondents agreed to the amount of fertilizer used in the jajar legowo planting system is less because there are not as many rice plants as the conventional planting system. According to [16] the number of seedlings per planting hole can affect rice growth and production. However, planting a large number of seedlings per planting hole, in addition to causing a waste of money, can also result in competition between plants for food and sunlight, so that the resulting production is not optimal.

Based on the discussion of the number of inputs used, the results of this study are in the negative perception category, while in [1] research, is in the very good category, because there are differences in adequate facilities, high awareness, production results as expected and easy to get information on innovation and technology of jajar legowo system.

Farmers' Perception of Costs Used

Farmers' perceptions of the costs used are the costs incurred include the purchase of seeds, fertilizers and labor costs with jajar legowo rice planting system. For more details can be seen in Table 4.

Table 4. Respondents' Perception of the Cost of Jajar Legowo System

| Indicator | Alternative Answer | | | Total | Average Total Score |
|--------------------------------------------------------------------------------------------------------|--------------------|---------------|----------------|-------|---------------------|
| | Agree | Undecided | Disagree | | |
| 1. Seed purchase costs are less with the jajar legowo system compared to the conventional system | 9 (24,32%) | 8 (21,62%) | 20 (54,05%) | 37 | 1,70 |
| 2. Fertilizer purchase costs are less with the jajar legowo system compared to the conventional system | 2 (5,41%) | 8 (21,62%) | 27 (72,97%) | 37 | 1,32 |
| 3. Labor costs are less with the jajar legowo system than the conventional system. | 2 (5,41%) | 8 (21,62%) | 27 (72,97%) | 37 | 1,32 |
| | | | | | 1,44 |

Source: data processing

Based on the research results that can be seen in Table 4, the indicator of the cost of purchasing seeds with the jajar legowo system gets a perception in the neutral category with an average of 1.70. According to farmer respondents, the use of seeds in the jajar legowo planting system is more profitable due to fewer planting holes and planting distances that are not close together like conventional planting systems. A total of 8 farmer respondents expressed doubt on the grounds that the cost of purchasing seeds between the jajar legowo planting system and the conventional system is no difference. It can be seen in the indicator of the cost of purchasing fertilizer with a jajar legowo system get a perception in the negative category with an average of 1.32. According to farmer respondents for the purchase of fertilizer and labor costs in the system jajar legowo more tinggi than the conventional system so as to make farmers less profitable.

Based on the discussion of the costs used in the jajar legowo system in Padang City, the results of this study are quite in line with the results of [11] research which states that farmers' responses are less favorable to the costs used in the jajar legowo system in terms of seed costs, fertilizer costs, and labor costs compared to conventional planting systems.

Farmers' Perceptions of the Results Obtained

Farmers' perceptions of the results obtained are the results obtained include the results of tillers and production results with the jajar legowo rice planting system. For more details can be seen in Table 5.

Table 5. Respondents' Perception of the Yield in the Jajar Legowo System

| Indicator | Alternative Answer | | | Total | Average Total Score |
|------------------------------------------------------------------------------------|--------------------|---------------|----------------|-------|---------------------|
| | Agree | Undecided | Disagree | | |
| 1. Rice paddy tillers yield more with jajar legowo system than conventional system | 9 (24,32%) | 1 (2,70%) | 27 (72,97%) | 37 | 1,51 |
| 2. Yields are higher with the jajar legowo system than the conventional system | 2 (5,41%) | 8 (21,62%) | 27 (72,97%) | 37 | 1,32 |
| | | | | | 1,41 |

Source: data processing

Based on the results of research in Table 5, on the indicator of the results of rice paddy tillers with jajar legowo system

get a perception in the negative category with an average of 1.51. According to the respondent farmers the results of tiller system jajar legowo not like conventionoanl system, the results of the tiller of the system jajar legowo less On the indicator of production results with jajar legowo system get perception in negative ketgori with an average of 1.32. According to the respondent's petai the production results obtained did not increase from the conventional system, in fact farmers get less results with the jajar legowo system.

Based on the results of the discussion regarding the results obtained in the jajar legowo planting system in Padang City, the results of this study are very different from the research conducted by [4] which states that farmers strongly agree with the jajar legowo system because the jajar legowo system can increase production yields and more tillers than using conventional planting systems.

Farmers' perceptions of all variables of the jajar legowo cropping system in Padang City obtained the following total average scores:

Table 6. Farmers' Perception of the Jajar Legowo Planting System

| No. | Variable of Jajar Legowo System | Average Score | Perception |
|-----|----------------------------------------------------|---------------|------------|
| 1 | Labor Use with Jajar Legowo System | 1,11 | Negative |
| 2 | Number of Inputs used with the Jajar Legowo System | 1,40 | Negative |
| 3 | Costs used with the Jajar legowo System | 1,44 | Negative |
| 4 | Results obtained with the Jajar Legowo System | 1,41 | Negative |

Table 6 shows that farmers' perception of the jajar legowo system in Padang City is in the negative category. According to the respondent farmers using the jajar legowo system cannot be as profitable as using the conventional planting system, because farmers feel from the results obtained there is no significant increase in production results obtained. In the innovation decision-making process, individuals form an attitude of liking or disliking innovation. Selective perception is important in determining individual behavior when determining their decisions, the perceived attributes of an innovation such as relative advantage, compatibility, and complexity are very important [12].

When the socialization of the review activities with the jajar legowo system using superior varieties by the West Sumatra Agricultural Technology Assessment Agency (BPTP) and the Padang City Agriculture Office, many farmers refused to participate in the review activities and apply the jajar legowo system because for farmers it is more profitable to use the conventional system. According to farmers, the conventional system has no disadvantages and using varieties other than PB-42 has no place for marketing, because rice mills only want to sell rice from PB-42 varieties.

At the socialization of the jajar legowo system, it was conveyed that farmers will receive seed and fertilizer assistance. The Setia Budi farmer group will receive hand sprayers and ticks for jajar legowo. 10 members of the Setia Budi farmer group were selected to participate in the jajar legowo system. The group members who were selected to participate in the field study did not incur any costs from land cultivation to harvesting. Because all the costs of the field study activities were borne by BPTP West Sumatra.

At the time of the application of the jajar legowo system, farmers had difficulties in land cultivation and rice planting. Because farmers must spread the straw on the land to be processed at the time of land cultivation, the straw is usually directly burned by farmers. Spreading straw on the land to be processed into organic fertilizer at the time of plowing, to increase soil fertility exposed to chemical elements. The difficulty during planting is that farmers are not accustomed to planting rice that is spaced according to the existing planting holes. Farmers were disappointed with BPTP and the Department of Agriculture because they did not get the help of jajar legowo ticks as promised during socialization, so that farmers had difficulty when making planting lines for jajar legowo.

Farmers were also disappointed because during the implementation of the field study on the jajar legowo system,

extension workers only assisted farmers until they planted rice, after which there was no assistance from extension workers to farmers to implement the jajar legowo system. After conducting the applied study activities, the results of production obtained by farmers were not by those delivered by BPTP and the Agriculture Office during socialization, because leafhoppers attacked the farmers' rice plants and there was no solution for pest management from the extension agent.

After the review activities were carried out, only 2 farmers applied the jajar legowo system due to the availability of seeds of superior varieties and fertilizers for one planting season. The results obtained by farmers are not proportional to the costs incurred for the production process. This made all group members return to using the conventional system. According to [13] novelty in assumption, or novelty in subjective things that are interpreted for a person, which determines his reaction to the innovation. In other words, if something is seen as new to someone, then it is an innovation.

[3] states that the nature of attachment to tradition is an important issue. New innovations or technologies cannot simply be disseminated for farmers to implement, even if it is sometimes done with half-forced recommendations. This is the case for farmers in Kota Padang. These farmers still cannot let go of their attachment to conventional methods, even though they acknowledge some of the good points of the jajar legowo system that has been offered through extension services. They feel more comfortable in the bonds of tradition. They also think that by applying the conventional method, they can fulfill their daily needs.

V. CONCLUSION

In this study, the following research conclusions can be drawn:

1. Rice farmers who apply the jajar legowo system in the Setia Budi farmer group have a productive age category, the education level is mostly high school graduates, the land area owned by farmers ranges around 0.25 - 1.25 Ha, land ownership status is mostly cultivated land and with an average farming experience of 49 years.
2. Farmers' perceptions of the application of the jajar legowo system in the Setia Budi farmer group in Padang City were found to be negative. In the category of labor, the number of inputs used, the costs used and the results obtained required more in the application of the jajar legowo system than the conventional system. attacks.

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