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Farmers' Opinions as Irrigation Water Users Concerning Changes in Methods of Irrigation in Pakis, Malang

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Abstract: The System of Rice Intensification (SRI) method is a water-saving method accompanied by suitable plant management methods. Therefore, this method can increase the productivity of rice plants better than conventional irrigation methods. However, despite the great potential obtained from rice cultivation with SRI, there are still many things whose success is still doubtful if applied widely. The Pakis Irrigation Area (D.I), located in Malang Regency, has an area of 721 hectares of rice fields. The planting pattern at D.I Pakis requires the proper distribution of irrigation water services to produce optimal crop production, both time and quantity. In saving water for irrigation purposes, the SRI method has a savings rate of 88.65% compared to conventional methods. However, SRI has some obstacles in its implementation. Farmer response factors and inhibiting factors in implementing a cropping plan using a water supply system through the application of this method to D.I Pakis are studied. It aimed to determine the level of farmer acceptance. Inhibiting factors for the application of rice cultivation in the SRI method consist of technical factors, social factors, and economic factors.

Keywords: SRI method, farmer response, inhibiting factors.

农民作为灌溉用水者关于改变帕基斯、玛琅的灌溉方法的意见

关键词：水稻集约化系统是一种节水方法，并伴有适当的植物管理方法。因此，这种方法比常规灌溉方法可以更好地提高水稻植株的生产力。然而，尽管利用水稻集约化系统种植水稻具有巨大潜力，但仍有许多事情如果广泛应用，其成功率仍然值得怀疑。位于玛琅摄政区的帕基斯灌溉区(在)拥有721公顷的稻田。在蕨类的种植模式需要适当分配灌溉用水服务，以在时间和数量上实现最佳作物生产。在节水灌溉方面，水稻系统方法与传统方法相比节水率为88.65%。然而，水稻集约化制度的实施存在一些障碍。通过将这种方法应用于在蕨类，研究了使用供水系统实施种植计划的农民反应因素和抑制因素。它旨在确定农民的接受程度。水稻集约化系统法应用水稻栽培的制约因素包括技术因素、社会因素和经济因素。

摘要：水稻集约化方法、农民反应、抑制因素的系统。

1. Introduction

Food is the most basic human need, and its fulfillment is part of the human rights of every Indonesian people. Food administration that is carried out aims to meet basic human needs, which must provide fair, equitable, and sustainable benefits based on Food Sovereignty, Food Independence, and Food Security. The System of Rice Intensification SRI method provides irrigation water intermittently, which is measured visually according to the age of the rice without puddles in the rice field. Therefore, this rice cultivation method has the potential to play a role in conserving water. In addition, this method can even increase rice productivity by changing the management of crops, soil, water, and nutrients. The SRI rice cultivation method increases rice production by more than 50 percent.

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SRI is a holistic agroecological crop management technique seeking alternatives to high-input-oriented agriculture. It is one of the scientific management tools for allocating irrigation water based on soil and climatic conditions to achieve maximum crop production per unit of water applied over a unit area. The system of rice intensification is not a fixed package of technical specifications but a system of production with four main components, viz., planting method, weed control, soil fertility management, and water (irrigation) management [1]. SRI can help save water, enhance yield and economies of water use, and provide an opportunity for yield improvements in rice production [2, 3]. SRI is a promising resource-conserving method of growing rice under irrigated and rain-fed conditions, as the method is based on alternate wetting and drying interval. The application of controlled irrigation reduces nitrogen export to the environment compared to flooding irrigation management and reverses climate change [4].

Respondents had a negative perception of the adverse long-term effects of agrochemicals on agricultural productivity and low tillage. It was found that there should be a relationship between several socioeconomic factors, such as education, information sources used, extension participation, and the perception of sustainable agricultural practices [5]. In the agricultural development sector, to introduce appropriate agricultural innovations and attain sustainable productivity improvements, it is necessary to design context-specific projects and policies with active farmer participation [6]. However, the conventional methods require much water for irrigation, which means they are not suitable for an area with water scarcity. Limited water availability conditions, SRI with 20% organic material is recommended as an alternative rice cultivation method [7].

SRI technology has strengths and weaknesses. The most visible strengths are that the production of SRI is higher than in conventional cultivation systems. The most dominant weaknesses are the lack of human resources from farmers who master the SRI system cultivation technique, which can hinder the development of this water-saving cultivation technology [8]. There is a solid relationship between farmer attitude and perception. The findings imply that improvements in conservation farming techniques should be made through improved perceptions [9, 10]. It concluded that the lack of communication and insufficient training program was the extension constraints experienced by the respondents in the adoption of SRI technology. A systematic strategy for providing an effective training program for large-scale capacity building should be evolved [3].

On the other side, to accelerate SRI area expansion by attracting conventional farmers to shift their practice from conventional to SRI, the government is recommended to use information about the economic benefits of raising cattle and implementing biogas in the extension material of agricultural extension agents [11]. The introduction of SRI by extension officers as a new technology with promising improved productivity results was not sufficient to promote uptake, especially in resource-constrained settings. The findings also underscore the importance of knowing the farmer's resource abilities as this may considerably influence the adoption of agricultural technologies [12]

The Pakis Irrigation Area (D.I) is managed by the SDA and Tumpang Irrigation Service Unit (UPTD) of Malang Regency. The Pakis Irrigation Area originates from Kali Jilu and has an irrigation service area of 721 hectares. The tendency of local farmers in managing this irrigated area is based on conventional techniques of providing irrigation water for rice cultivation, namely by continuous inundation regardless of the amount of water needed for plants. Provision of irrigation water without paying attention to real needs in the field can result in suboptimal growth of rice plants. From the existing problems, it is necessary to carry out a study on the irrigation water supply system that can increase water use efficiency. That is so that the plant water needs in all the rice fields can be met. In addition, it is necessary to analyze farmers' responses to the SRI method of rice cultivation to determine the inhibiting factors of the application of rice cultivation using the SRI method at the study location.

2. Material and Method

2.1. Study Area

The Pakis irrigation area, located in Pakis Sub District, is D.I Pakis. Pakis Sub District is located at 112° 40'18"- 112 ° 45' 07" East Longitude and 7° 59 '56 "- 7° 56' 21" South Latitude with the following boundaries: North: SingosariSub District, East: Jabung Sub District, South: Tumpang Sub District, and West: Malang City**.**

2.2. Scenario Calculation of Irrigation Water Needs

In order to describe the need for irrigation water in D.I Pakis, primary and secondary data are needed. The data collected was obtained from interviews with the Irrigation Officer at D.I Pakis. The interview aims to find out the problems and irrigation systems in D.I Pakis. Secondary data collected were in the form of 10 daily average Pakis Weir Intake discharge, D.I Pakis Scheme, 10 daily plant data, and planting schedules

and patterns according to RTTG. This data is needed to determine the raw area of rice fields, the existing planting intensity, and the planting plan schedule proposed by the UPTD Water Resources and Tumpang Irrigation.

For determining the level of water use savings in the existing cropping conditions, calculations are made using 3 (three) alternatives in providing irrigation water to D.I Pakis. The first alternative is to use a conventional water supply system that has been implemented in the study location, namely continuous inundation. The second alternative is providing water with the SRI method. In contrast, the third alternative is the combination of conventional methods in the upstream part, especially in groups I and II, and the SRI method in the downstream part, especially in group III, by dividing the planting area.

To compare the three alternatives above, the calculation of the need for irrigation water for the existing cropping pattern, the planting pattern according to the RTTG, the planned cropping pattern, and the Paddy-Paddy-Paddy cropping pattern was also carried out.

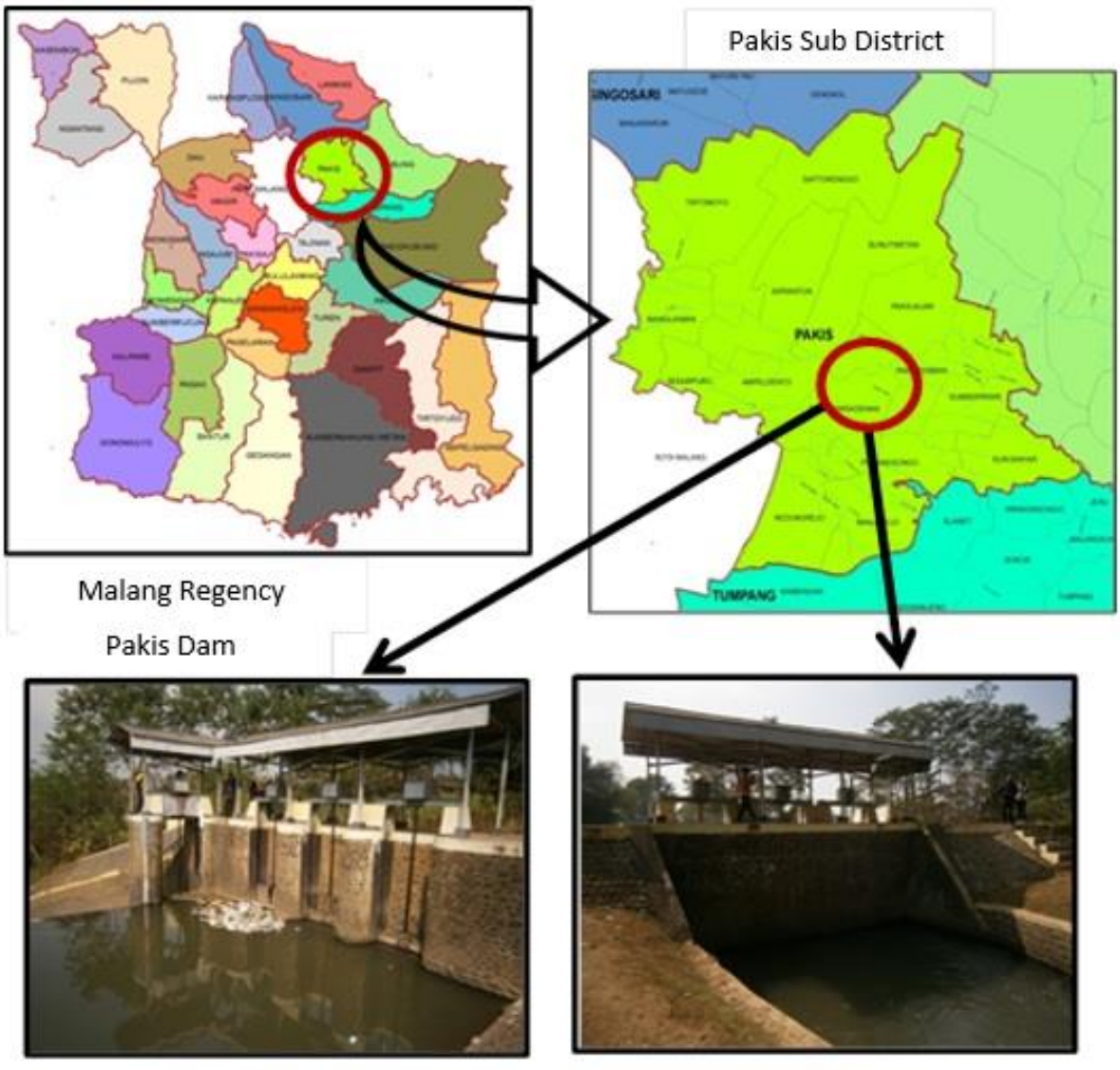

Fig. 1 Map of the site study

2.3. Sampling Method and Question List Data Analysis

This study took a descriptive survey method. It is a research method that aims to extract information and provide an overview of something, both situations and events that are widespread from the studied object. The survey results were used to determine farmers' response and inhibiting factors in implementing the planting plan using the SRI method in Pakis District, Malang Regency.

The questionnaire consists of 5 pages consisting of 20 questions divided into 2 parts, namely questions about the existing conditions of agricultural land and questions related to farmers' responses to the application of the SRI Method in the Irrigation Area (D.I) of Ferns. The sampling method used was simple

random sampling. In this case, it is assumed that every population member has an equal chance of being included as a sample. Therefore, this method is called simple random sampling. Therefore, the sample obtained is random (random sample). The number of respondents in this study was 102 farmers. The questionnaires were distributed in the following ways:

- The distribution of the questionnaire was carried out by gathering several farmers in one forum who were then interviewed and asked to fill out the questionnaire.
- Questionnaires were distributed by visiting each farmer's house or door to door.
- Farmer group leaders conducted the distribution of questionnaires to their members.

To assess the questionnaire, the authors used a Likert scale which measures the attitudes, opinions, and perceptions of a person or group of people about social phenomena. The social phenomenon referred to in this study is the irrigation system in irrigating the respondents' land. Each instrument item's answer is assessed using a Likert scale with a distinctive gradation from very negative to very positive. The questions have a score from 1 to 5, with different character scale classifications for each number according to the context. It aims to determine the scale of the properties and serves to find out the general and comprehensive data results from the results of the questionnaire assessment obtained.

3. Result and Discussion

3.1. Comparison of Planting Intensity Calculations

This study calculates irrigation water needs for 4 (four) types of cropping patterns. It consists of the existing cropping pattern, the cropping pattern according to the Global Planting Plan (RTTG), the cropping pattern, and the Paddy-Paddy-Paddy cropping pattern. The table 1 is a recapitulation of the cropping intensity for each of the cropping patterns mentioned above:

Table 1 Recapitulation of planting intensity in 4 (four) planting patterns

Period of Growing Season	Cropping Intensity %											
	Existing Cropping Pattern			Cropping Pattern Suitable With RTTG			Plan Cropping Pattern			Cropping Pattern Paddy-Paddy-Paddy		
	Paddy	Palawija	Cane	Paddy	Palawija	Cane	Paddy	Palawija	Cane	Paddy	Palawija	Cane
I	92.81	5.42	1.71	95.01	2.77	2.22	95.50	2.77	1.73	100.00	0.00	0.00
II	86.22	8.00	1.73	85.30	12.48	2.22	95.50	2.77	1.73	100.00	0.00	0.00
III	65.58	16.13	1.72	80.44	17.34	2.22	95.50	2.77	1.73	100.00	0.00	0.00
Total	279.31			300.00			300.00			300.00		

Source: Authors' calculation results

It is shown that there is an increase in planting intensity in the existing cropping pattern, from 279.31% to 300%. The increase in cropping intensity was focused on increasing the planting intensity of rice, namely in the existing cropping pattern of 244.60%. In contrast, in the planned cropping pattern, an increase of 286.50% was made (41.90%).

3.2. Irrigation Water Needs

Recapitulation of calculations regarding irrigation water requirements for existing cropping patterns, cropping patterns according to the RTTG, planned cropping patterns, and Paddy-Paddy-Paddy cropping patterns using 3 (three) alternative methods, including conventional methods, SRI methods, and combined methods are summarized in the following table 2.

Table 2 Percentage of total irrigation water needs in 4 (four) types of planting patterns

Percentage	Existing Cropping Pattern	Cropping Pattern Suitable With RTTG	Plan Cropping Pattern	Cropping Pattern Paddy-Paddy-Paddy
Percentage of Total Need of Irrigation Water SRI Method Towards Conventional Method	87.32%	87.06%	88.65%	89.31%
Percentage of Total Need of Irrigation Water Combined Method Towards Conventional Method	28.58%	28.57%	29.03%	29.04%
Percentage of Total Need of Irrigation Water SRI Method Towards Combined Method	82.34%	81.96%	84.12%	85.06%

Source: Authors' calculation results

Based on the calculation of irrigation water needs and a comparison with the available discharge, the SRI method with 4 (four) different cropping patterns has the highest level of savings when compared to the Conventional Method and the Combined Method. Furthermore, this calculation has a percentage above 87%. The remaining water, in this case, can be used for raw water needs and industrial needs around D.I Pakis. In fact, after calculating the Paddy-Paddy-Paddy cropping pattern with 100% rice intensity per planting season, the available water at the study location is categorized as still relatively abundant. Therefore, it can be said that the water supply system of the SRI method is a system that can optimize the available flow rate with optimal water use settings. That is useful for increasing the optimal planting intensity of rice while still reviewing the basis of planning and the LPR-FPR method as a result of the evaluation.

3.2. Analysis of the Characteristics of Respondents at D.I Pakis

The respondents' general conditions include age, formal and non-formal education, farming experience, farming cropping patterns, types of fertilizers used, sources of agricultural irrigation, land area for farming, land tenure status, and sources of farming capital.

3.2.1. Age

In general, the age of the farmers in the study area ranged from 35 to 64 years and over. According to the results of interviews that have been conducted, it is difficult to find farmers under 34 years of age. Most of the population under 34 years of age prefers to work in factories rather than farming.

From the survey results, it can be seen that almost 84% of the farmers in the study location are over 45 years old. It is related to the difficulty of farmers in adopting innovation, one of which is the application of the SRI method.

3.2.2. Respondents' Education Level and Business Experience

The results showed that the formal education level of farmers was low. Some do not go to school, and most only graduate from SD, SLTP, and SLTA. Fairly good farmer participation in non-formal education SLPHT (Integrated Pest Management Field School) reaches 55%. However, the percentage of non-formal SRI Cultivation education only reaches 7%. That is because the local government, through related agencies, has not implemented the SRI program evenly. That is what makes the SRI method of rice cultivation common to farmers in the study locations.

The experience of farming rice for the farmers is relatively long, which is more than 10 years and over. That makes it difficult to change the habits of farmers who use conventional methods to switch to applying the SRI method. Therefore, the picture obtained identifies that farmers are very experienced in doing farming with conventional methods, where they are also very adept at managing each step of their farming activities. It is supported by the knowledge they have acquired since they were young.

3.2.3. Farm Cropping Patterns and Agricultural Irrigation Resources

Farm cropping patterns are closely related to agricultural irrigation sources. For example, suppose the source of agricultural irrigation in an area is considered good. Then, it is closely related to the amount of water available which can carry out the maximum agricultural cropping pattern every year.

Based on the percentage of the agricultural cropping pattern above, it can be concluded that most of the respondents apply the rice cropping pattern three times a year, with the percentage rate reaching 65%. That is due to the irrigation system in the study area, which is a technically irrigated agricultural area with relatively smooth irrigation facilities throughout the year.

3.2.4. Types of Fertilizer Used

`Fertilizer is a material added to the planting medium or plants to meet the nutrient needs needed by the plant so that the plant can produce well. In rice cultivation, in addition to using organic fertilizers as essential fertilizers, several chemical fertilizers are also used, such as Urea, TSP, and Ponska, with a frequency of 1-2 times according to the farmer's ability. It can be concluded that most of the respondents used two types of fertilizers (organic fertilizers and chemical fertilizers), with the percentage reaching 84%. The intensive use of chemical fertilizers has the effect of damaging the soil structure. The problem with using organic fertilizers technically is that farmers still think that organic fertilizers are impractical. They still feel more comfortable using synthetic fertilizers and pesticides because they are almost always available whenever and wherever they need them. Farmers also still think that the weakness of organic farming is a decrease in productivity at the early stages of implementation.

3.2.5. Respondents' cultivated land area

The survey results concluded that the cultivated land that farmers managed had a relatively narrow area, where some farmers only had an area of fewer than 1.0 hectares.

3.2.6. Land Tenure Status

Most of the land ownership status is a farmer as the owner and tenant, with the percentage reaching 82%.

3.2.7. Sources of Farming Capital

Until now, capital is still a problem for most farmers. In general, farmers still rely on agricultural products (the sale of agricultural products) as capital to operate their following farming activities. It can be seen from field data which reveals that most or 98% of farmers only use personal capital. However, farmers also received additional capital in loans from relatives, friends, or agricultural product collectors.

3.3. Analysis of the Application of Planting Patterns and Existing Irrigation Systems at D.I Pakis

The questions in the questionnaire in this section are related to cropping patterns and irrigation systems. That is useful for measuring a system that has been applied to the study location so far. The following are the answer points for all the questions in this section:

1. Most of the respondents know what the Global Planting Plan (RTTG) means. However, respondents do not always apply the RTTG that related parties have issued. It has been explained in the evaluation of the existing cropping intensity. According to the RTTG issued by the UPTD Water Resources and Tumpang Irrigation, in one year, three (3) planting seasons are planned with a planting intensity of up to 300% each year. In addition, the results of the evaluation previously described also showed that the average planting intensity each year was 279.31%. Thus, it can be concluded that there is a mismatch between the planting plan and the planting realization carried out by the respondent.
2. According to the respondent, the irrigation water supply system at D.I Pakis is excellent. They rarely experience water shortages; even irrigation water shortages only occur 1 to 2 times a year. Therefore, irrigation water distribution services are always felt on time and in the right amount. From the water balance analysis results of the existing conditions, it was found that the amount of water was sufficient to meet the needs of irrigation water in D.I Pakis.

From the results of the calculation of the questionnaire for the first part of the question, it is known that the character scale that dominates the whole question is "GOOD". That indicates that most respondents have a high answer score in answering each question. Thus, it can be concluded that the irrigation system at D.I fern is perfect. This finding indicates good cooperation between the head of the farmer groups, the Water User Farmer Association (HIPPA), the Irrigation Officer, and the related agencies who accommodate and respond to all of the respondent's problems. However, respondents are expected to be able to apply a cropping pattern following the RTTG to obtain optimal planting intensity and benefits.

3.4. Analysis of Farmers' Responses to the Implementation of Rice Cultivation Using the SRI Method at D.I Pakis

The questions in the questionnaire in this section are about farmers' responses to the application of the SRI method of rice cultivation at the study location. The following are the answer points to all the questions in this section:

a. Many respondents do not know about the SRI method of rice cultivation. That is because the local government, through related agencies, has not implemented the SRI program evenly so that the SRI method of rice cultivation is commonplace for farmers in the study locations.

b. Respondents disagree if the number of rice seeds to plant is only 5-7 kg/ha with a seed age of only 7-10 days. Respondents are still hesitant to plant one seed per planting hole with a relatively young rice age, so they continue to plant two to three seeds per planting hole at 20-25 days. The reason is for backup at the time of embroidery. However, according to their thinking, SRI rice cultivation is that if the seeds are planted a lot, they will compete in the absorption of nutrients, oxygen, and sunlight. The rationale for seeds planted at the age of 7-10 days is because the seeds still have their food reserves (chitri), so when the chitri runs out, the ability of the roots to absorb nutrients from the soil is good. Thus, SRI rice cultivation can speed up the planting period of seeds to speed up the harvest time by several days.

c. Respondents disagree if their agricultural land only uses organic fertilizers. They think that to increase production yields, the use of chemical fertilizers and drugs must also be increased. One other obstacle that makes them reluctant to use organic fertilizers is the limited availability of compost raw material in animal manure for making organic fertilizers. Farmers' behavior is still very dependent on inorganic fertilizers and synthetic pesticides. It can be interpreted that the independence of the farmers has decreased. The instant culture born from practicality, such as living the sow without making the personal one and the ease of outside input because it is available in the store, is the cause of this. In addition, the intensive use of chemical fertilizers damages the soil structure and causes environmental pollution and disease in humans.

d. Almost all respondents wanted rice production on agricultural land to reach 6 - 8 tonnes/ha, while respondents usually only obtained rice production in 4 - 6 tonnes/ha. SRI rice cultivation can form more tillers, ranging from 30 to 40 tillers/hill. Meanwhile, the conventional method only ranges from 20-25 tillers/clumps.

e. Respondents disagree if doing business requires a more significant number of workers. However, the SRI method of rice cultivation does

require a more significant amount of energy than conventional methods. New activities cause the difference in labor use in the SRI method of rice farming and more intensive activities, such as making organic fertilizers and pesticides, controlling weeds (weeding), managing water, and controlling pests with organic pesticides. In addition, the labor costs for SRI cultivation are more expensive than conventional methods because it requires patience and diligence from the workforce.

f. Respondents agree if they spend more capital on improving irrigation network facilities. That is because usually, in one farmer group, the management of funds or a fee is carried out and one of the uses of this fee is to improve small-scale irrigation network facilities.

g. Respondents disagree that the use of irrigation water is more efficient than usual. That is because respondents have a habit of stagnating water with a depth of 3-5 cm at the age of 30-50 days, then inundating water with a depth of 5-8 cm before harvest. Whereas, in principle, the SRI method of water regulation is the arrangement of water provision so that when the water conditions in the land are pretty chaotic, when should the water be inundated and when should it be dried? With drying, the height growth of the rice stalks will be suppressed due to limited nitrogen absorption. As a result, rice stalks will be significant, have a strong condition so that they have good resistance to pests and plant diseases, wind gusts, exposure to heavy rains, and most importantly, starch storage will be more active. Therefore, compared with the conventional method, the SRI method can save irrigation water use, reaching 95-98 percent during the nursery and 23-46 percent at maintenance.

From the analysis, it is known that the scale of the character that dominates the whole question is "DON'T AGREE". Most of the respondents answered each question with a common choice of answer score. Based on the answers obtained, it was concluded that the respondents disagreed with applying the SRI method of rice cultivation at D.I Pakis.

3.5. Recapitulation of the Questionnaire Results

Based on the results of the analysis carried out previously regarding the existing conditions of agricultural land, the irrigation water system, and the response of farmers to the application of the SRI Method at D.I Pakis, the following conclusions can be drawn (table 3):

Table 3 Recapitulation of the questionnaire results

No.	Subject	Response
1.	The suitability of the existing cropping pattern applied to the Global Cropping Pattern Plan (RTTG)	Unsuitable
2.	The system of giving irrigation water at the Irrigation Area (D.I) of Pakis	Good
3.	The farmer's response to the application of paddy cultivation using the SRI (System of Rice Intensification) Method	Disagree

Source: Analysis Results

3.6. Factors that Hinder the Implementation of SRI Method of Rice Cultivation

After analyzing the farmers' responses regarding the application of the SRI method of rice cultivation, several factors were found that influenced the application of the SRI method of rice cultivation (table 4).

Table 4 Inhibiting factors to the application of SRI method of rice cultivation

No.	Inhibiting Factor	The Farmers' Answer	Percentage
1	Still in doubt and never see the result of SRI (System of Rice Intensification) yet	28	28%
2	Never see the result of SRI (System of Rice Intensification) Yet	3	3%
3	Still in doubt	10	10%
4	The cost is more expensive than the conventional method	11	11%
5	The technology implemented is complicated	42	42%
6	Do not really understand SRI (System of Rice Intensification) yet	6	6%
Total		100	100%

Source: Authors' Calculation Results

Based on the answers of conventional farmers who are reluctant to apply the SRI method of rice cultivation, the factors that cause the weak motivation of farmers to apply this rice cultivation are obtained. Namely, the technology applied to the SRI method is more complicated than the conventional method, which is shown by 42%. From the factors that have been mentioned above, conclusions can be drawn about several things that become obstacles in the application of the SRI method of rice cultivation, which consists of technical, social, and economic aspects.

3.7. Technical Factors

The technology applied to the SRI method is more complicated than the conventional method. The SRI rice cultivation system is considered more complicated by farmers and requires more intensive attention, where they must be painstaking, patient, and intensive, especially in the early stages. Management at this early stage is not only draining, attention and cost, but also time. Farmers have to spend more energy, time, and money (especially labor). Fertilization and plant maintenance techniques are quite troublesome for them, both in terms of energy and time that have to be utterly devoted to losing the opportunity to work for an income outside of farming. Technically, the obstacle in organic farming is that farmers still think that organic farming is not practical. They still feel more comfortable using synthetic fertilizers and pesticides because they are almost always available whenever and wherever. Farmers also still think that the weakness of organic farming is a decrease in productivity at the early stages of implementation. At this stage, farmers experience difficulties because, in addition to experiencing a decrease in productivity, they also have to bear the increase in production costs. In the early stages of applying organic farming, much manure or compost is needed. For farmers who do not own livestock, this will be pretty difficult.

3.8. Social Factors

3.8.1. Age Factor

Age is closely related to health, the physical ability of farmers in carrying out farming activities, and the experience gained. Therefore, many farmers stated that the age factor is very influential in carrying out farming activities, especially the SRI method of rice management, which according to them, requires a relatively more painstaking management effort compared to conventional methods of rice management.

3.8.2. Education factor

The level of formal education will affect labor productivity and technology absorption. Low levels of education can result in lower levels of literacy and productivity. Non-formal education/out-of-school education is a practical education system in which the learning process is carried out while doing or studying based on the problems at hand.

3.8.3. Farming Experience Factor

The experience of farming rice for farmers is relatively long, which is more than 10 years and over. That makes it difficult to change the habits of conventional Method farmers to apply the SRI Method. So that the picture identifies that farmers are very experienced in doing farming with conventional methods and are very adept at managing each step of their farming activities; this is supported because they have obtained knowledge from their young people.

3.9. Economic Factors

3.9.1. Limited Capital

The use of organic fertilizers, which is quite large, especially in the early stages of MT I and MT II, causes farmers to require additional costs in providing organic materials and labor costs. For example, farmers' efforts to procure sheep to ensure the availability of animal manure require a large number of funds at the time of the initial investment because the procurement includes purchasing animals and making stables. Until now, capital is still a problem for most farmers. Farmers still rely on capital from selling agricultural products to operate their next farm.

3.9.2. Limited Network Marketing for Organic Rice

Although the selling price of organic rice using the SRI method is higher than the conventional rice price with an average difference of IDR 500/kg GKG, the organic rice marketing network is also weak where traders accommodating organic rice are still limited. This factor is something that can inhibit the development of SRI organic rice.

Based on the factors described, it was found that the most dominant factor in the application of the SRI method of rice cultivation namely social factors. This social factor is related to each farmer's personal experience with the application of rice cultivation that they have been implementing so far. Innovations or technologies cannot simply be disseminated and applied by farmers. Farmers still cannot let go of their attachment to conventional methods, even though they acknowledge some of the advantages that have been offered through extensions related to the SRI method. However, when coaching is ended and positioned to make decisions, farmers are inconsistent with innovation. They feel more comfortable in the bonds of tradition.

There needs to be an adoption process in applying an innovation. The adoption process is divided into 5 stages which include: (1) the awareness stage, which is the stage of learning new thoughts or technologies, (2) paying attention stage; in this stage, there will be a sense of wanting to know more and seeking information, (3) stage evaluation, in which adopter farmers consider the goodness of the new technology, (4) the testing stage, is in the form of an effort to prove it little by little, (5) adoption, which is the stage where farmers have applied new technology as it should be.

Therefore, there is a need for assistance or counseling from facilitators or extension workers, especially in strengthening motivation. Farmers must first understand before implementing the latest method through training in the SRI method of rice cultivation. In this case, related agencies also need to apply the SRI method of rice cultivation by renting land at the study location.

The related agency must provide a better example of success due to applying the SRI method so that farmers have the desire to apply this method. In this case, the SRI method of rice cultivation is an intensive and efficient way of cultivating rice plants with a root system management process. It is based on groundwater and plant management while maintaining productivity and prioritizing ecological values to create harmony and balance and environmental harmony in both biotic and abiotic environments.

4. Conclusion

According to the calculations and analysis carried out in this study, several conclusions can be drawn as follows:

1. Percentage rate of irrigation water requirement savings according to the cropping plan using the SRI method of the water supply system to conventional methods is greater than 80%.

2. Based on the results of the questionnaire analysis, the conclusions obtained are as follows:

a. Respondents disagreed with applying the SRI method of rice cultivation at D.I Pakis as shown by 68.63%.

b. Inhibiting factors for the application of the SRI method of rice cultivation consist of:

- Technical factors that inhibit rice cultivation using the SRI method are that the technology is more complicated than conventional methods.
- Social factors that inhibit rice cultivation with the SRI method are age, education level, and farming experience.
- Economic factors that hamper rice cultivation with the SRI method are limited capital at the farm level and limited organic rice marketing networks.

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