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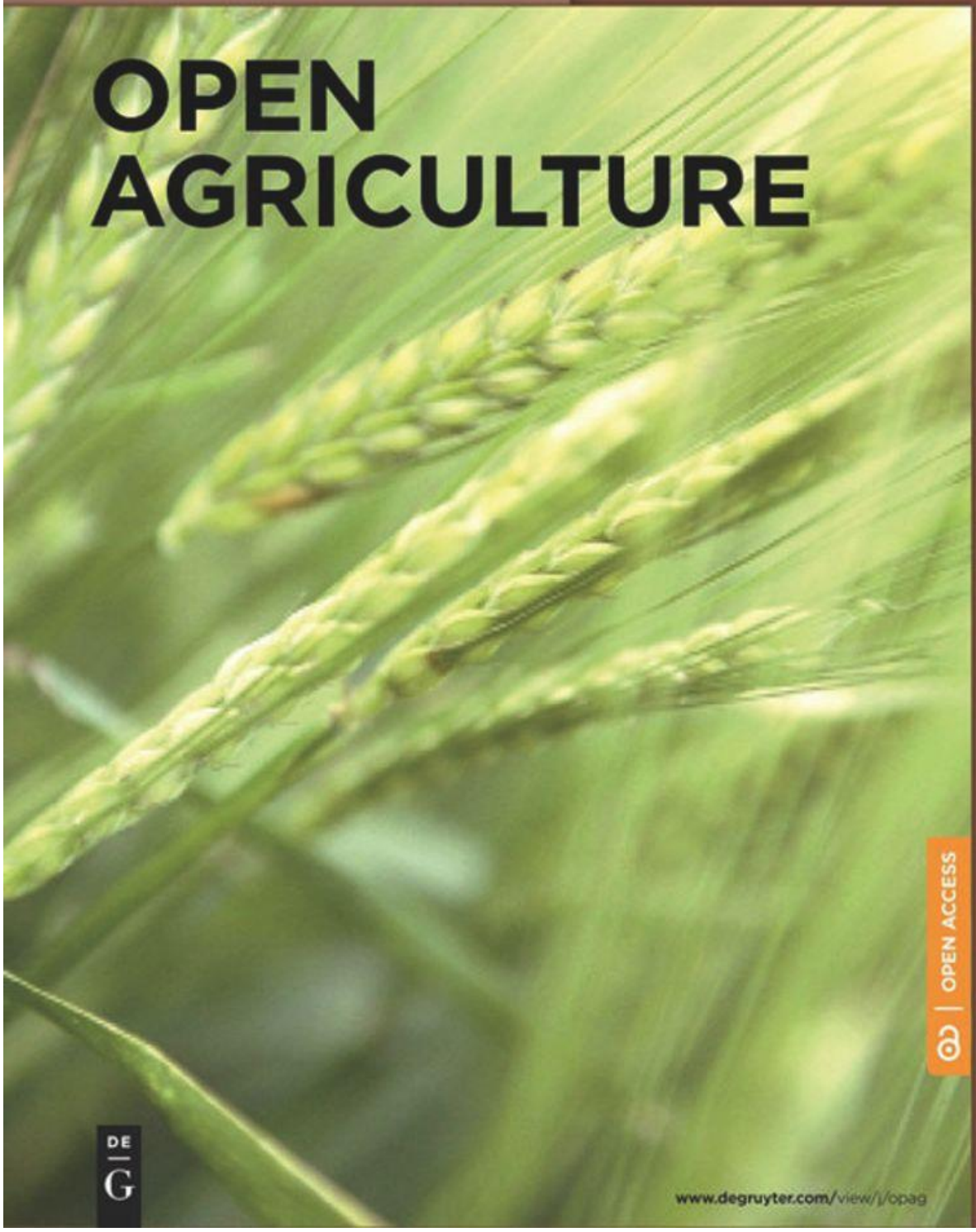

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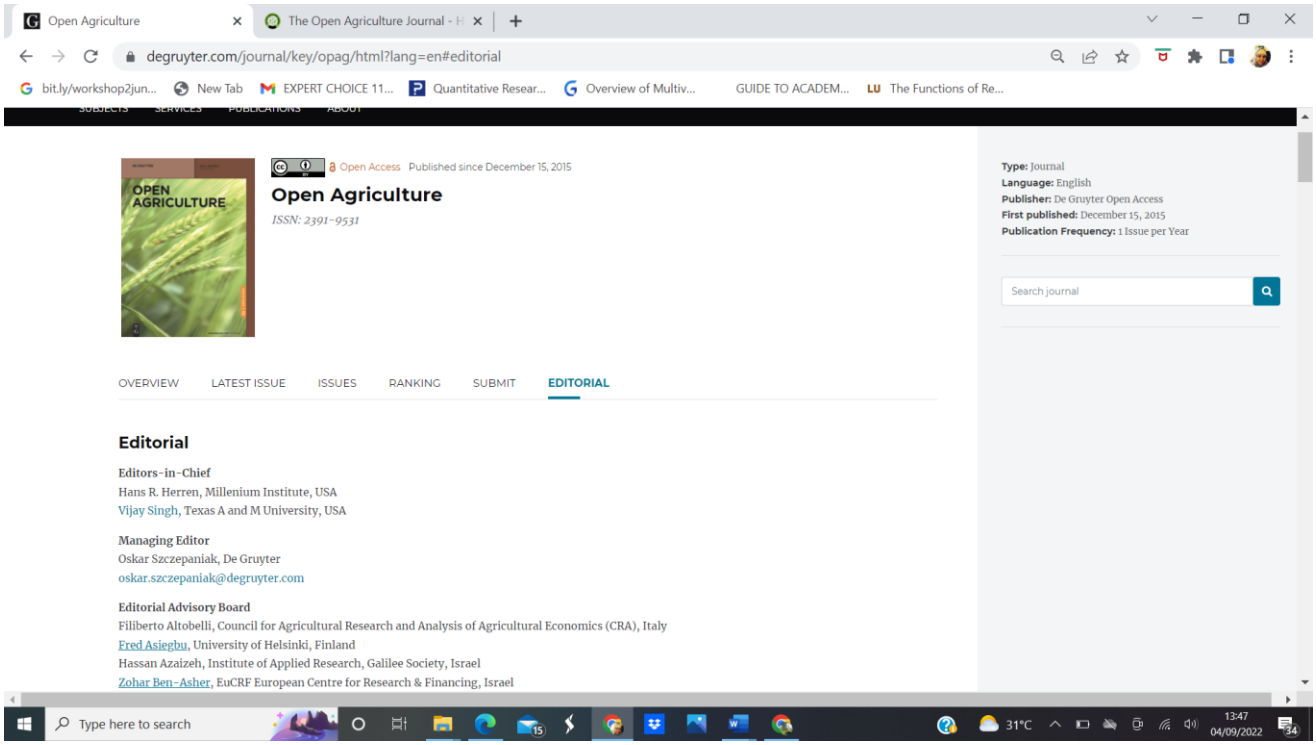
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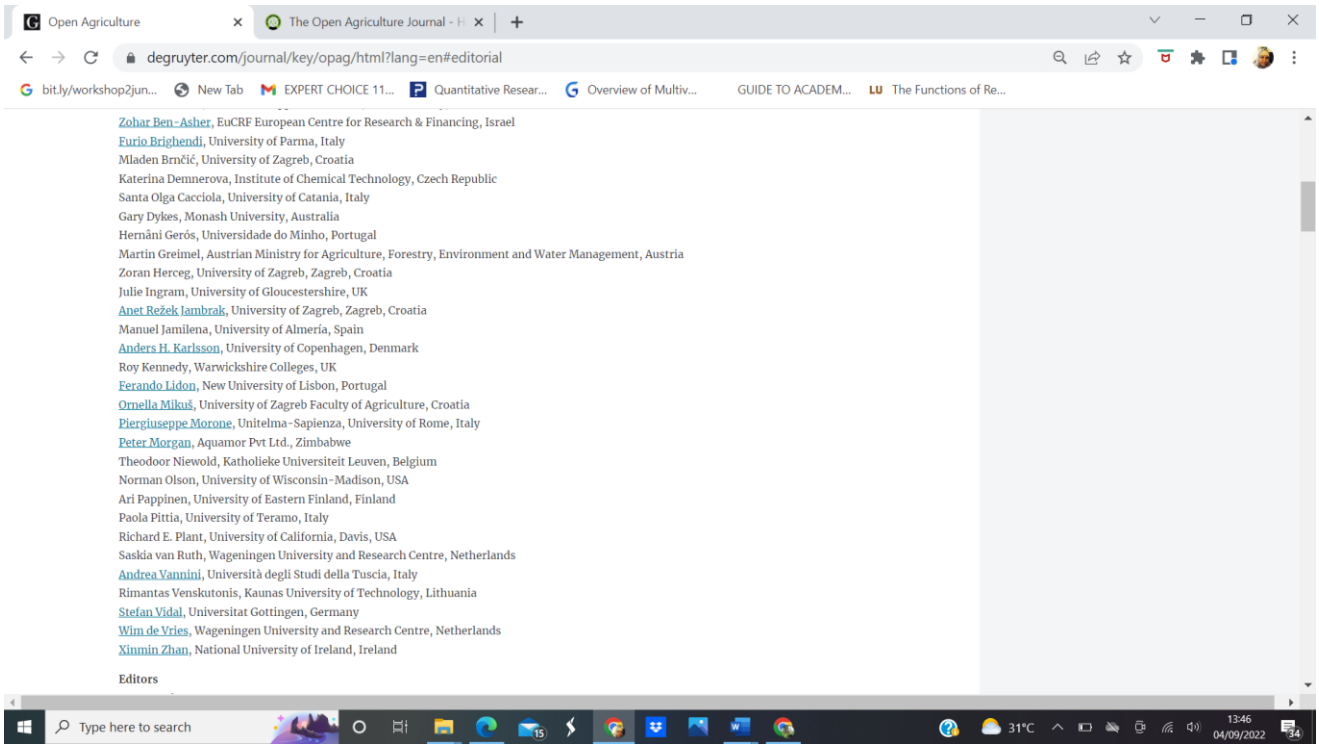
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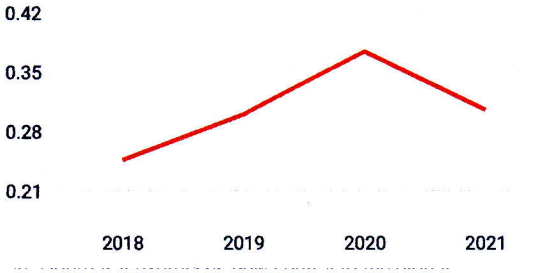

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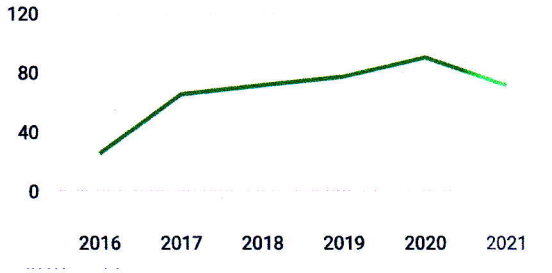

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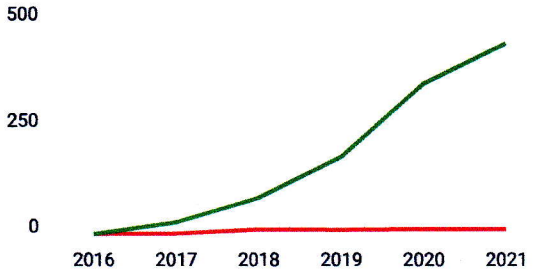

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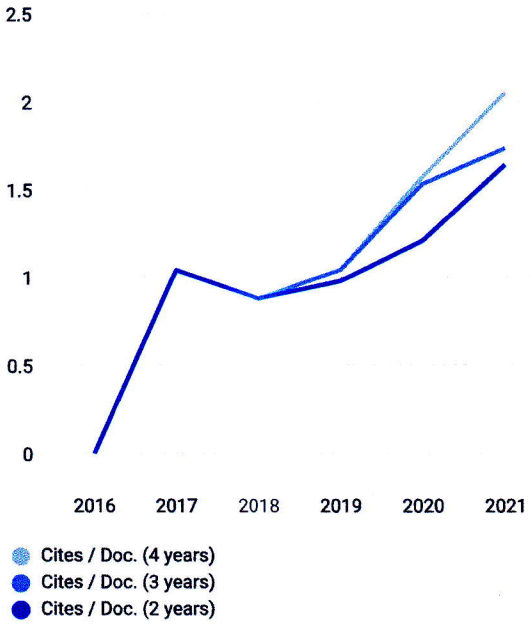

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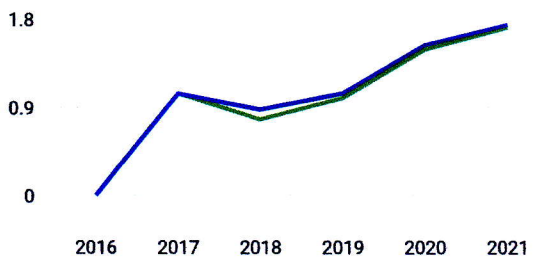

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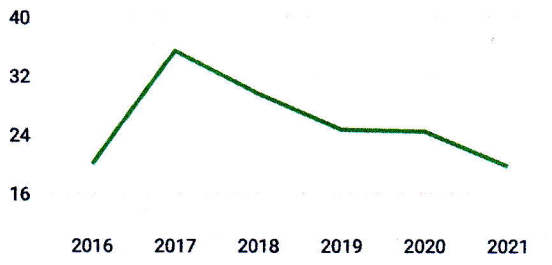

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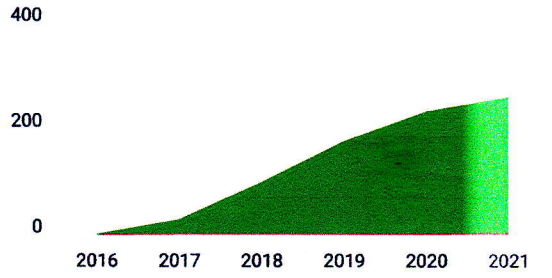

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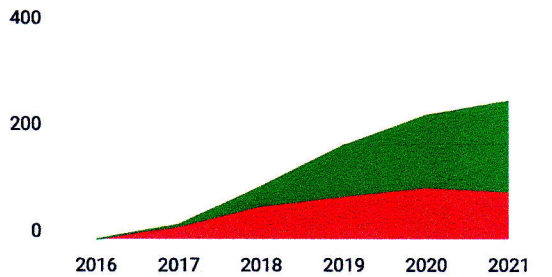

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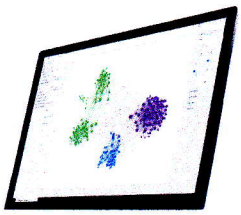

Research Article

Poppy Arsil*, Yeong Sheng Tey, Mark Brindal, Ardiansyah, Eni Sumarni, Masrukhi

Perceived attributes driving the adoption of system of rice intensification: The Indonesian farmers' view

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Abstract: This article argues that the System of Rice Intensification (SRI) future promotion should be based on the potential users' good understanding of sustainable agriculture. A qualitative approach was used to examine the perceptions of SRI attributes among Indonesian rice farmers, which is built upon the developing theory of diffusion of innovation. Through focus group discussions in three Indonesian provinces, compatibility, complexity, and relative advantage were identified as essential factors for SRI adoption. SRI was seen as incompatible with current farming practices, labour capacity, budget, and time available for additional labour inputs. SRI was seen as relatively complicated in terms of compost processing and application as well as mechanised agricultural technologies. As a result of the economic surplus provided by SRI rice, organised farmers may be able to obtain a higher price for SRI rice than non-organised farmers. Environmental and agronomic benefits were thought to have a long-term payoff. Such results demonstrate the subjective evaluation of SRI by farmers, which is important to its implementation.

Keywords: compatibility, complexity, diffusion of innovation, Rogers' theory, relative advantage

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1 Introduction

One innovation aimed at increasing rice productivity is the System of Rice Intensification (SRI). This innovation emphasises sustainability principles in managing local plants, soil, water, and nutrients and their incorporation into farmers' current practices (where they deem compatible). SRI, as promoted to rice farmers in our study areas, is a set of principles [1]. Core principles of the SRI are (1) younger seedling, (2) one seedling planted at one clump, (3) wide square planting (more than 20 cm × 20 cm), and (4) intermittent irrigation [2]. SRI is a fluid technological package [1]. It needs to be adjusted according to local nuances. Even though the sudden conversion from standard practice to fully organic is not recommended [3], organic fertilisers are still advised to reduce synthetic fertilisers and improve the soil structure and quality [4]. Different kinds of biological control further differentiate SRI from conventional weed and pest management [1,4]. Through the SRI principles, rice plants are reported more resistant to pests and pathogens as their leaves are bolder, larger, and stronger than those planted using conventional systems [5]. When properly followed and implemented, chemical inputs, water, and seed are used efficiently [2]. Because the system diminishes external inputs, SRI principles have positive impacts on resource and environmental conservation [1]. As such, SRI offers a means to realise the goals of sustainable agriculture. Importantly, too, given its flexibility and robustness, SRI principles are applicable to small-scale farmers.

Despite offering great potential, the adoption rate of the SRI generally remains low, especially among Indonesian rice farmers [6–9]. However, little research effort has been made to understand why adoption rates remain low. This issue has, to the best of our knowledge, only been investigated by Takahashi [8]. Like many farmers' adoption studies (i.e. [10]), their investigation focused on relating the heterogeneity of producer, farm, institutional, and intervention variables to adoptive decisions.

Others investigate the effect of intermittent irrigation on rice yield [11]. Such approaches are criticised for providing a few practical insights, which might help extension agents understand how to encourage greater adoption [12,13]. Farmers' opinion and ideas are based on their experience over the years when practising farming. Therefore, their knowledge can be used as an explanation of the variation of input and output quantities in rice production that existed and sometimes cannot be explained statistically. The objective of SRI adoption set by policymakers is to increase farmer incomes and food security as well as improved environmental quality. Policymakers and change agents should understand SRI from the subjective view of farmers as potential users. Thus, policymakers can achieve the goal of adoption of the SRI method. Focus group discussion (FGD) is one way to obtain farmers' insight from different SRI exposure in a natural discussion guided by a moderator.

SRI was introduced in Indonesia during 1997. Local farmers were introduced to the SRI methods through self-help training in plant ecology lessons in 2002 in Tasikmalaya. As the pioneer, this area serves as a key learning resource to farmers or group of farmers, extension agents, and researchers. In contrast to the history of SRI in the Tasikmalaya regency, Purbalingga and Tabanan regencies followed the SRI program initiated by the Indonesian Government. The program was introduced to local farmers in the mid of 2000s. However, the adoption rate, for example in Purbalingga, was considered low, which was less than half of the local rice farmers who participated in the SRI programme initiated by the local Government.

In Rogers' seminal synthesis on the adoption of innovations, innovation attributes are identified as having a profound impact on farmers' adaptive decisions [14]. Agricultural studies have also demonstrated the importance of the perceived attributes of innovation in relation to its adoption (i.e. [15]). However, as posited in ref. [12], the current explanatory power of past empirical studies is less than adequate. Their work suggests that a lot of important information on perceived innovation attributes is likely to remain unaccounted when using restrictive empirical methods. To address this research gap that we have identified, this study examines the perceptions of SRI attributes held by current and potential Indonesian users. We propose to do this using the exploratory framework as prepositioned by Rogers [14]. In this framework, innovation attributes are theorised to influence farm decision-making in relation to its adoption. This study utilises a qualitative approach to understand adoption, focusing on the role of SRI attributes. The study aims to investigate farmers' views of perceived attributes driving the adoption of SRI through the use of a focus group in a frame of Rogers' theory of the adoption of innovation. A key benefit of this approach is that it does not involve judgement from the researchers. It values what individual farmers believe the attributes are and evaluates which attributes are acceptable from their point of view [16].

In Rogers' theory of diffusion of innovation [14], there are five common attributes of innovations: relative advantage, complexity, compatibility, observability, and trialability. Individuals are likely to vary in their perceptions according to a matrix based on their congruence stretching across attributes. The term "relative advantage" refers to the extent to which new ideas, behaviours, and objects are viewed as more innovative and superior to the innovations they are replacing [14]. It is commonly evidenced through financial costs and/or gains. Sustainable innovations that generate a net financial advantage, both perceived and actual, are more likely to be adopted [17]. Additional relative advantages include timesaving, reduction of discomfort, social prestige, and immediacy of the benefits from the innovation.

Compatibility is defined as the degree to which potential adopters perceived the innovation consistent with their existing values and past experiences [14]. This is traditionally interpreted in terms of the compatibility with an existing system, with little modification [18]. Sustainable innovations that are believed to be necessary and applicable are more likely to be adopted [19]. Similar inclination is also likely to crystallise when a sustainable innovation is aligned with the value of a social system [20]. Complexity is described as the degree to which potential users perceived the innovation as relatively difficult to comprehend and use ([14], p. 15). Complex innovations typically involve a new learning curve before initiating them into practice. They are less likely to be adopted [21]. Trialability is characterised by "the degree to which an innovation may be experimented with on a limited basis" ([14], p. 16). Trial on a small scale allows users to experiment with the integration of innovations within an existing system and to learn relative advantages and handle the complexity of innovations prior to their full implementation. Trialability thereby reduces the risk associated with and increases the likelihood of adoption [22]. Observability is the degree to which others can see the results of an

innovation [14]. Visibility is split into practice observability and benefit observability. Being able to see the actual implementation and the associated benefits strengthen the inclination towards adoption [23]. According to Rogers [14], the perception of innovation attributes affects an individual's action. Favourable ones are more likely to induce farmers to adopt and continue using the innovation.

2 Methods

Guided by Rogers' conceptual framework [14], FGDs were conducted in the Tasikmalaya, Purbalingga, and Tabanan regencies. Tasikmalaya regency is known as the pioneer of SRI implementation and becomes the central learning of SRI farming practices. Purbalingga and Tabanan regencies followed through a government assistance program. Tasikmalaya and Purbalingga are regencies on the island of Java, the most populated island in Indonesia, whereas the Tabanan regency is located on the Bali island. Our target participants were rice farmers who have heard of the SRI. A total of 40 key informants participated in the FGD held. They were selected according to the recommendations made by local extension agents and the leader of farmer organisations. The participants were selected based on their knowledge and experience and their roles in the community. Two subgroup FGDs consisted of five to nine participants for each regency to give all participants enough time to share. The first subgroup consisted of farmers who received the SRI program's government assistance, whereas the other did not receive the assistance program for data cross-checking. Each subgroup involved SRI adopters and dis-adopters. Careful consideration was given to the definition of "SRI adopters." Figure 1 shows how the research was conducted to cross-check the data.

Some researchers have argued that farmers who applied at least one core practice of SRI can be classified as adopters [6,24]. That same definition is applied in local standards and, in turn, is used in this study. Dis-adopters are rice farmers who are aware of, have applied, but then have discontinued using SRI principles. A skilled moderator led the FGDs using a semi-structured interview. The moderator would stop the FGDs if no more comprehensive new information is identified.

As the FGDs were conducted in Indonesia, the collected information was transcribed and translated into English to achieve a standard understanding across the individual researchers involved in this study. Two researchers identified the common keywords, the subsequent themes (attributes), and patterns, which the FGD participants valued following Rogers' theory of the adoption of innovation.

3 Results and discussion

The characteristics of the participants of the FGDs are presented in Table 1. On average, the participants are approximately 50 years old, and most of them completed senior high school education. Two-thirds of the participants

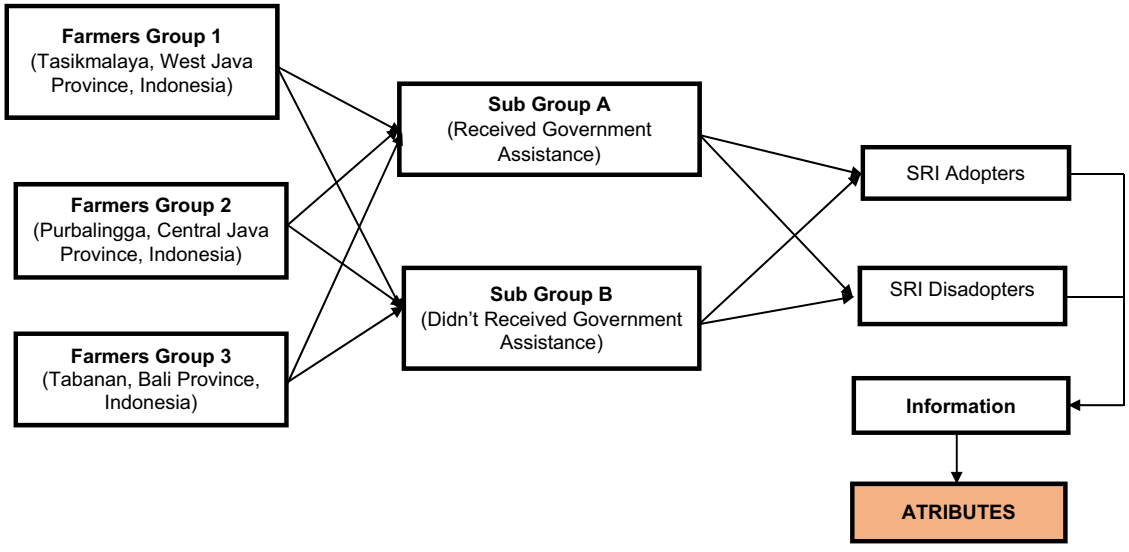

Figure 1: Research model.

Table 1: Respondents' characteristics of FGDs

Characteristics	Tasikmalaya (n = 12) Mean	Purbalingga (n = 18) Mean	Tabanan (n = 10) Mean	Overall (n = 40) Mean
Age (years old)	48.4	49.1	54.1	50.33
Male (%)	83	78	100	87
Education level				
Primary school (%)	16	—	10	8.7
Junior high school (%)	—	17	20	12.3
Senior high school (%)	42	50	60	50.7
University (%)	42	33	10	27.7
SRI adopters (%)	58.3	55.6	60	58
SRI dis-adopters (%)	41.7	44.4	40	42
Duration applying the SRI (year)	10	2.8	3.8	5.53
Land area planted using the SRI (ha)	6.146	3.740	3.681	4.52
Fertiliser and pest control methods				
Fully organic inputs (%)	16.7	—	20	12,3
Mixed organic and chemical inputs (%)	83.3	100	80	87.7

were adopters of the SRI. The pioneers in Tasikmalaya regency started using the SRI 10 years ago on 6.15 hectares of rice farm. Their counterparts in Purbalingga and Tabanan have had less than 5 years' experience with the innovation and applied it on smaller scales. It was observed that only a fraction of the adopters had entirely used organic inputs. The majority employed a mix of organic and chemical inputs.

FGD participants frequently mentioned common keywords such as rice yields, production costs, price of the SRI rice, the use of organic fertiliser, labour capacity, land preparation, and water irrigation control. The keywords were categorised into three significant attributes of SRI, according to Rogers' theory of the adoption of innovation. They are compatibility, complexity, and relative advantages. These findings are substantially congruent with Rogers' general framework [14]. Each of these significant attributes is interrelated with the others. Little mention was made of perceived trialability by implementing a trial on a small scale of paddy field to experiment with the innovation. The FGD participants did not mention perceived observability such as success story. These two less significant attributes are similarly identified by Tornatzky and Klein [25] and Rogers [14]. Table 2 shows the dimensions driving the adoption and dis-adoption of SRI.

3.1 Compatibility

Despite several years of experience, previous rice farming experience and local culture still constrained their SRI practises. This remains, therefore, a major concern. Application of the SRI principles requires the modification of existing farming practices. Adopters from the Purbalingga regency remained uncomfortable with planting seeds in a tray, shallow planting, and the land preparation methods, all of which are promoted under SRI. Similar concerns were also expressed by adopters from the Tabanan regency, specifically concerning the discipline required to grow seed for less than 10 days before transplanting and then transplant the seed at a rate of one seed per hole.

> "Although SRI techniques are well-intended to boost seedling survival rate and vegetation, it is difficult to change the mindset of farmworkers who are used to conventional methods."
> Dis-adopter from Tabanan, two years of SRI experience.

Resistance to change in technical aspect was commonly mentioned as partial reasoning contributing to dis-adoption. Those who chose to observe from the sidelines remained sceptical, preferring to wait to see how SRI techniques would affect farm productivity. The same observation is shared by Sato et al. [9] and Handono [26]. Other researchers also reported that some farmers are lazy to learn and adopt new technology [27].

The implementation of sustainable weed and pest management is labour intensive [28]. Participants typically observed rapid growth of weeds and snails as a result of the SRI because it involves cultivating rice with wide spacing between plants, the use of organic fertilisers, and less water. Snail invasion was said to be particularly prevalent soon after the transplanting cycle.

Table 2: Determinant attributes driving the adoption and dis-adoption of SRI following Rogers' theory of the adoption of innovation

Dimensions of innovation	Benefits	Obstacles
Compatibility	—	1. Need a modification of existing farming practices involving planting seeds technique, land preparation, and water control 2. Persistent to change in the technical view of rice agriculture
Complexity	—	1. Difficult to adjust the appropriate organic fertiliser according to spatial farming requirement 2. Farmers face a shortage of raw material for making organic fertiliser.
Relative advantages	1. Farmers believe that the SRI method yields higher productivity than conventional practices if farmers follow the SRI principles 2. The production cost of seed might be reduced due to less seed used 3. Price is higher than traditional farming of rice if the farmer cooperatives have bargaining power at the markets 4. SRI increases natural pest and disease control in the paddy field 5. Soil condition improved 6. Water usage decreased	1. Extra labour is needed for planting, weeding, applying fertiliser, and water control 2. Scarce farm labour against high industrial demand 3. Price seems the same as conventional rice farming if the farmers or farmer cooperatives have no bargaining power at the markets
Immediacy of results	—	A significant time gap between the time of adoption and returns of the application of SRI methods

3.2 Complexity

As SRI principles encourage organic fertiliser use, adopters have to grapple with a degree of complexity in judging the farm's nutrient needs and applying the appropriate organic fertiliser according to their farm's spatial requirements. The knowledge of integrated nutrient management is crucial for sustaining high yield of SRI [29]. In our study areas, composts are promoted as suitable organic fertilisers that restore organic matter and enhance soil properties. Subsidised by local Government, such organic fertiliser is sold at affordable prices. Given its affordability, high local demand is often unsatisfied because of supply shortages. Consequently, participants in the SRI program are often forced to do the extra task of making their own compost. Although most of them received training in both composting and application techniques, production and application processes in respect to composts are not always straightforward. Therefore, it is recommended that there is an unmet need to educate participants to become competent to troubleshoot composting problems (e.g. anaerobic fermentation or incorrect N:P:K balance) and determine the resultant quality of compost. This is in line with ref. 27 that increasing training access is useful to prepare farmers to practise SRI.

3.3 Relative advantages

Yield: Nearly all participants of the FGDs agreed that the SRI promises high productivity. Notwithstanding this, it must be noted that, in fact, productivity levels varied between enterprises.

However, the participants believed that the productivity of the SRI depends mainly on the adherence to its principles: use 5 tons/ha of compost, plant a single seedling in each hole with wide spacing between clumps, apply local microorganisms and at least four times, and conduct four periods of weeding each season. Liquid fermentation contains local microorganism derived from base material such as cow rumen or rabbit urine provided a useful decomposition tool for making nutrient available to plant. Then, the organism will reproduce with natural ingredients containing carbohydrates, proteins, vitamins, and minerals. Indeed, following these practices, adopters from Purbalingga and Tasikmalaya regencies produced approximately 7–8 ton/ha of milled

rice in comparison to the yield of conventional methods. Similar findings are also recorded by [30], who reported that Bangladesh farmers who implement water-saving technology (WST) of rice agriculture recorded higher productivity than farmers who were practising the conventional irrigation method. The farmers' income also increased by 24.6% when using the WST method.

SRI's superior yield was said to be a key factor contributing to the inclination to adopt and continue using the SRI principles.

> "Most SRI farmers in my area do not strictly follow the recommendations. We applied 3 ton/ha of compost, sole cropping systems, one time of local microorganisms, and 2–3 times of weeding in a season. We only produced about 7–8 ton/ha of milled rice on average. Nevertheless, the yield is still considered high compared to the 5 ton/ha of milled rice produced through conventional farming in the local area. Although we do not entirely follow the SRI, we are more directed to organic farming. Collectively, nearly 70% of land in Manonjaya sub-district is planted using organic methods, and the certified organic farmland is about 37 hectares."
> Adopter from Tasikmalaya, 10 years of SRI experience.

Production costs: Among participants of the FGDs, who have had experience with SRI techniques, there were mixed opinions with regard to production costs of SRI. Such findings were related to variations in the cost of seed, labour input, and organic fertilisers. Rice cultivated under the SRI generally uses less seed than conventional systems. Adopters from the Tabanan regency indicated that the cost of seeds was reduced as much as 65% and this had led them to save more money.

As previously mentioned, extra labour hours were necessarily allocated for planting, weeding, fertilisation, and irrigation activities. The greater demand for human input further squeezed the already scarce farm labour, which has increasingly shifted to other industries. The availability of farm labour thus becomes a critical issue in some local contexts. For example, access to labour has been identified as a key factor determining the continuity of SRI in the Jeneponto district of the South Sulawesi province [8] and Madagascar [27]. Farmers who have an opportunity to more labour resources have increased their capability to adopt SRI [27].

As demonstrated above, any calculation of production costs is not straightforward. The application of SRI techniques could save nearly 20% production cost [31] and decrease production cost with the benefit–cost ratio of 1.49 [30]. However, FGD participants relied on their subjective evaluation rather than an objective one when weighing the cost and benefit for their decision-making.

> "We support the government program aiming at achieving 10 ton/ha of milled rice. Through SRI techniques, I used to produce around 8 ton/ha of milled rice, but its production cost was high. In opposite, the *Jajar Legowo* technique, a planting rice method with the pattern of multiple rows of rice plant interspersed with an empty row, is simpler in terms of planting and crop maintenance. Although I achieved slightly lower yield (7–7.7 ton/ha) using the traditional method, the associated cost was significantly lower."
> Dis-adopter from the Tabanan regency, 6 years of SRI experience.

Price of SRI rice: The price of SRI rice was suggested to be the most important factor driving farmer decisions in relation to adoption and dis-adoption. Rice produced using the SRI principles, especially organic rice, is considered to be of higher quality and to have health benefits. Consequently, it should follow that SRI farmers should reap higher prices. However, two divisions were noted among our focus group participants. Organic SRI rice in the Purbalingga regency typically commands a price premium of about 50% above the standard market price. At the time of study, the SRI rice was sold for around 12,000–13,000 IDR/kg, and undifferentiated rice was priced at approximately 8,000 IDR/kg. This pricing outcome was due to the collective bargaining power of group action. Local organic farmers were engaged and organised through the Pamorbangga Farmer Association. The farmer association worked as a marketing agent, distributing local organic rice to Jakarta – the capital city of Indonesia – and selling directly to consumers. Without going through any middlemen, the farmer association recorded a higher profit margin and returned greater profits to its members.

> "Price of the organic rice that sold through the Pamorbangga Farmer Association is lucrative. However, this farmer association only covers a sub-district, and there are many organic farmers out there. We hope the local Government will help and support us to extend the outreach of the farmer association."
> Adopter from Purbalingga, 5 years of SRI experience.

In contrast, participants from the Tasikmalaya and Tabanan regencies had significantly less bargaining power on an individual basis. The price achieved for rice grown using SRI principles was only marginally higher than the price of conventional rice. Such pricing was already generally lower (8,000–9,000 IDR/kg) than the returns in the Purbalingga regency. This occurred because SRI rice was sold directly to a farmers' group (*gapoktan*) in the Tasikmalaya regency. With little premium gained for the extra effort involved, participants were demotivated and expressed an intention to quit the SRI.

> "Healthy rice is what we called for rice produced using SRI methods. However, its demand is still low. That leads to the low prices of SRI rice."
> Dis-adopter from Tabanan, 1 year of SRI experience.

Agronomic benefits: Through the integrated pest management that is promoted under the SRI, participants of our FGDs believed that they are likely to strike a natural balance in which pests and diseases are well controlled. Anecdotal evidence was provided by an adopter from Purbalingga that his rice plants cultivated using SRI techniques were more pest and disease resistant. The use of SRI is also believed to improve environmental quality such as improved soil aeration. Plants were also more resistant to diseases and pests [30]. Adopters of SRI observed that their soil conditions differed from non-users of SRI techniques.

Water-saving derived from the irrigation management that is promoted under the SRI was another significant impact that is valued by participants of the FGDs. Under controlled environment, water usage of SRI can be reduced up to 86% [4,30]. This translates into a significant improvement in water productivity [30]. Such benefit was said to be particularly critical during dry seasons.

Immediacy of results: Participants in our FGDs emphasised that they cannot afford to wait for long periods before they benefit from adopting SRI. Adopters have invested significant effort to learn and master SRI techniques to produce more satisfactory yields. In other words, there is a significant time gap between learning SRI methods and optimising returns from its use. Such lead times have led dis-adopters to believe that the SRI does not promise lucrative benefits in the short-term. This concern was particularly highlighted by participants who worked on leased lands under time-limited tenancies across all three study areas. As a result, such farmers had the minimal motivation to invest in the SRI.

Arsil et al. [32] who conducted a study regarding perceived importance and performance of SRI attributes between adopters and dis-adopters reported that "profit," "risk," and "effort" are three critical attributes for rice farmers. The performance of those attributes was reported below the average. In this study, profit is related to rice yield, production cost, and price. As other business-like attributes, the benefit is an important attribute by farmers. Therefore, the promotion of SRI should involve any effort related to increasing the SRI price. The risk was identified as a second essential attribute for both adopters and dis-adopters. Crop failure due to the complexity of mastering the SRI technique such as organic fertiliser application, farm nutrient needs according to their spatial requirement, land preparation, and planting the seed in trays are identified as barriers to adopt SRI for farmers. Applying the SRI technique is sometimes thought to be a waste of time and effort for farmers.

This study highlights that it is a subjective evaluation of SRI attributes that drives its adoption. While learning through experience, adopters remain objective. For example, SRI users expect their organic rice to command higher prices both in view of higher production costs and to achieve acceptable profit levels. Failure to meet their objectives is likely to result in discontinuation of SRI. The adoption process varied slightly between farmers and regions during the application of fertiliser and pest control method. Bali and Tasikmalaya farmers seem to use more organic fertiliser and pest control during the adoption of SRI. The heterogeneity of adoption might be affected by psychological, behavioural, economic, and technological factors [33].

4 Conclusions and policy implications

Through FGDs, a number of perceived attributes have been identified. Compatibility, complexity, and relative advantage appeared to be the key attributes driving the adoption of SRI. As their motivation for the adoption of SRI is centred on the relative advantages of economic returns, future promotions of SRI should highlight and inform potential users of the degree to which SRI is more profitable than competing rice farming systems in both the short- and long-run. Having convinced them to use and stay in the program seems likely to overcome farmer difficulty in the perception of SRI's non-economic relative advantages in the long-term.

Funding information: This study was partially supported by Universitas Jenderal Soedirman under the scheme of the competency research grant (contract number 2448/UN 23.14/PN/2018).

Author contributions: PA: conceptualisation, formal analysis, funding acquisition, writing – original draft, and writing – review and editing; YST and MB: conceptualisation and writing – original draft; A: formal analysis and

writing – review and editing; ES and M: project administration and formal analysis.

Conflict of interest: The authors state no conflict of interest.

Data availability statement: The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

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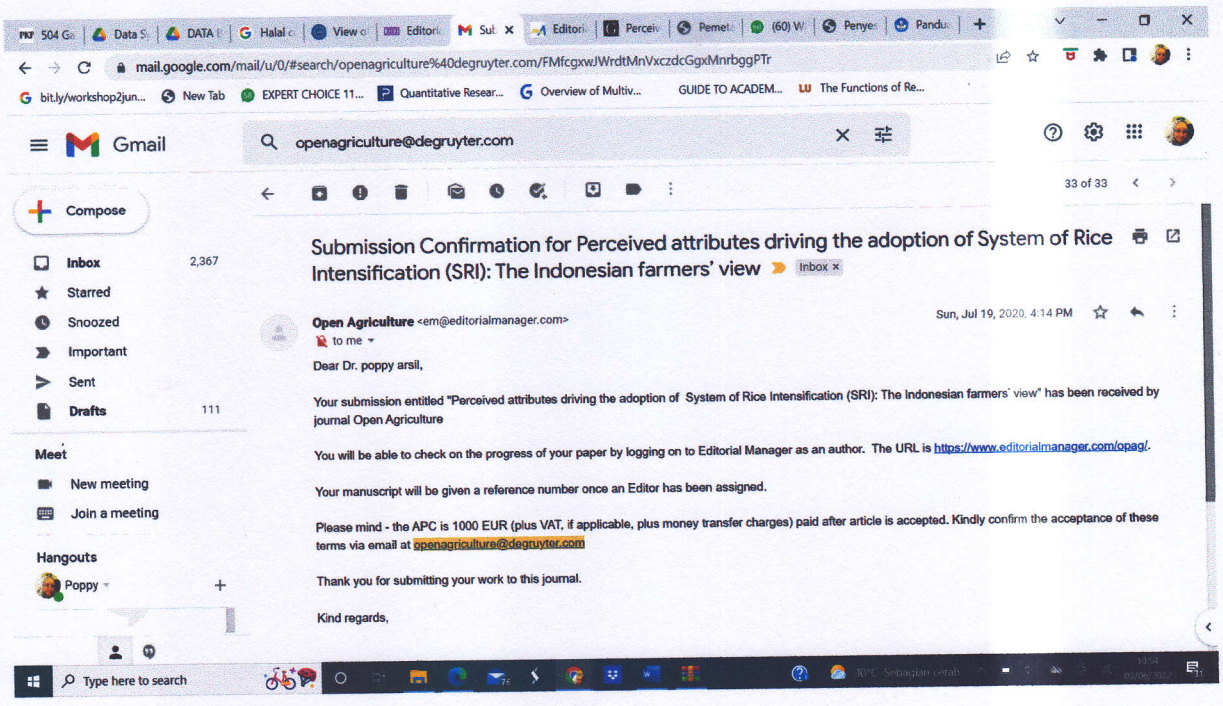
Koresponden si' Open Agriculture"

1. Submission



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Submission Confirmation for Perceived attributes driving the adoption of System of Rice Intensification (SRI): The Indonesian farmers' view

Open Agriculture <em@editorialmanager.com> Sun, Jul 19, 2020, 4:14 PM

to me

Dear Dr. poppy arsil,

Your submission entitled "Perceived attributes driving the adoption of System of Rice Intensification (SRI): The Indonesian farmers' view" has been received by journal Open Agriculture

You will be able to check on the progress of your paper by logging on to Editorial Manager as an author. The URL is https://www.editorialmanager.com/opag/.

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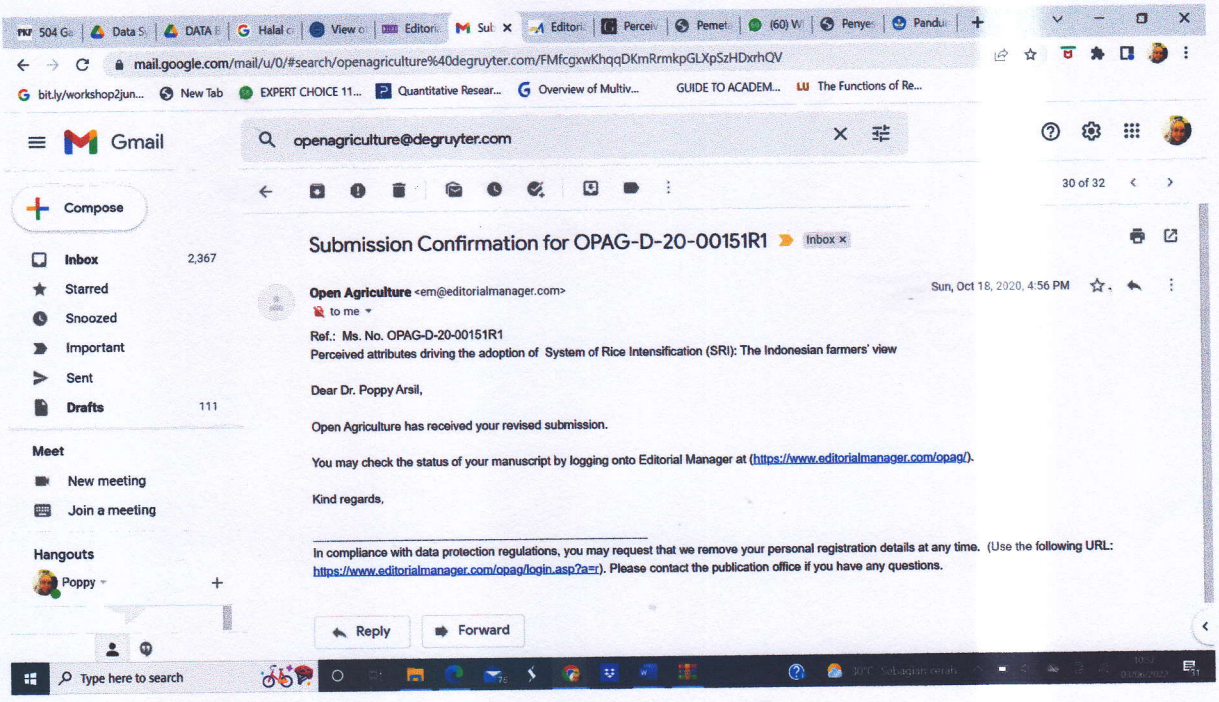
Thank you for submitting your work to this journal.

Kind regards,

2. Revisi 1



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Submission Confirmation for OPAG-D-20-00151R1

Open Agriculture <em@editorialmanager.com> Sun, Oct 18, 2020, 4:56 PM

to me

Ref.: Ms. No. OPAG-D-20-00151R1
Perceived attributes driving the adoption of System of Rice Intensification (SRI): The Indonesian farmers' view

Dear Dr. Poppy Arsil,

Open Agriculture has received your revised submission.

You may check the status of your manuscript by logging onto Editorial Manager at (https://www.editorialmanager.com/opag/).

Kind regards,

In compliance with data protection regulations, you may request that we remove your personal registration details at any time. (Use the following URL: https://www.editorialmanager.com/opag/login.asp?a=r). Please contact the publication office if you have any questions.

Reply Forward

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Ref.: Ms. No. OPAG-D-20-00151R1
Perceived attributes driving the adoption of System of Rice Intensification (SRI): The Indonesian farmers' view

Dear Dr. Poppy Arsil,

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ReplyForward

PAPER EVALUATION

Paper Title: Perceived attributes driving the adoption of System of Rice Intensification (SRI): The Indonesian farmers' view (Ms. No. OPAG-D-20-00151)

We are very grateful for the reviews provided by reviewers. We have revised the manuscript considering reviewers' comments and suggestion to improve the quality of the manuscript. Please see our detail comments, in red, in the manuscripts and Table below.

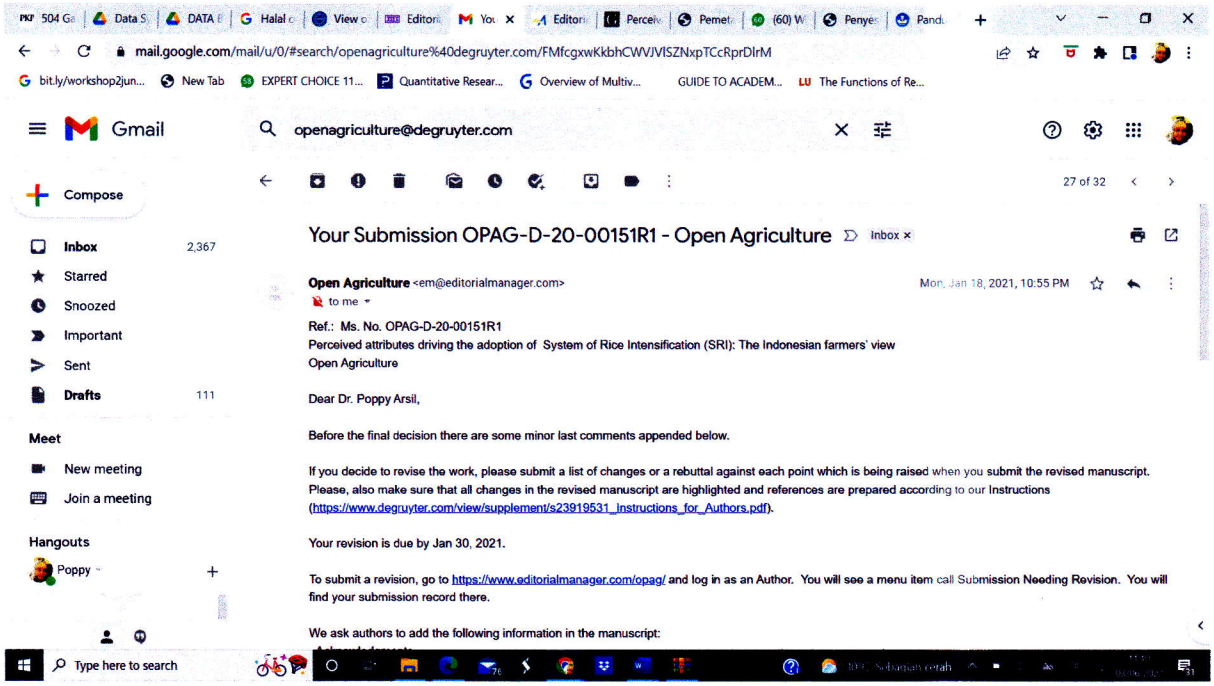
No	Comments	Author's response
Reviewer #1:		
1	Relevance of the topic and study design: In present days sustainability of farming practices is a must all over the world, and therefore this work is very relevant. The study design was appropriate, consisting on a qualitative evaluation through focus groups.	Thank you

2	Abstract and keywords: The abstract focuses the main points, including a brief context and objective, principal methodologies and results and a brief concluding remark. Please just correct in the last sentence "...demonstrate in, in fact, the subjective evaluation..." - delete the in before the comma.	We have deleted the in before the comma.
3	The keywords were adequately selected and they do not repeat the indexing terms of the title, which is correct. They are also in adequate number.	Thank you
4	Introduction: The introduction correctly describes the previous work relating to the investigation and its importance. The literature cited is relevant and includes an interesting number of references, although they are not recent (they are over five years). Therefore, I would recommend to complement the introduction by adding some more recent references (2015 or later), because in the recent years some scientific advances in this field might have already been achieved and the authors are missing possible recent studies.	See introduction. We added Nugroho et al. (2018), Ardiansyah et al. (2020) See results and discussion. We added Whitman et al. (2020), Gairhe and Thapa (2020), Uddin and Dhar (2020), Chavas and Nauges (2020).
5	Materials and methods: The section following introduction describes the principles of the Rogers' theory of diffusion of innovation, which is relevant to understand the methodologies used. The methodologies used are adequate and reported correctly.	Thank you
6	Results and discussion: The results are of qualitative nature, so the discussion is based on the obtained results from the focus groups. Additionally, the discussion is sometimes supported by referencing related works. Just put the number in subsection 4.3 Relative advantages, to make it match the previous parts: 4.1 Compatibility and 4.2 Complexity.	We have revised the subsection number.
7	The conclusions are also relevant and supported in the findings.	Thank you
8	Level of English: The use of English language is good.	Thank you
9	References: A good number of references is cited (35), but all of	We have added more recent publication: Ardiansyah et al.

	them are considered old (they are all over 5 years: < 2015), with a number of them even being about 30 years old. This is unacceptable, given the rate at which science advances, and therefore I consider that it is fundamental to include some newer references or else a great deal of advancement might not be considered.	(2020), Nugroho et al. (2018), Whitman et al. (2020), Gairhe and Thapa (2020), Uddin and Dhar (2020), Chavas and Nauges (2020).
Reviewer 2#		
1	The title "Perceived attributes driving the adoption of System of Rice Intensification (SRI): The Indonesian farmers' view" is descriptive and acceptable.	Thank you
2	The abstract is well written.	Thank you
3	The introduction needs a little bit improvement. The introduction should clearly show what has been done, the gap, and justify the importance of the work; clearly state the objectives also.	We added the gap and the importance of the works. The objective of the study has been mentioned (See Pg 2 Lines 54-64 and Lines 82-83).
4	The materials and methods part also needs an improvement. There are no materials listed. The methodology needs a little bit elaboration. It is better to show how the quality of the data (information) was determined or validated? was there a methodology for cross-checking or triangulation?	See Pg 3 Lines 116-128 and Fig. 1. We added statements of brief methods to show the quality of data.
5	Although the discussion is well written, the result is not clearly seen. It would have been better if there were quantified or figurative results (Tables or Figures), as far as the data allow, as a supporting evidence to refer to.	Please see Table 2.
6	This better be very brief and merged with the introduction. In the introduction, state what has been done, the gap and justifying the important of works; state the objective also.	We merged the section 1 and 2. We added the gap and the importance of the works. The objective of the study has been mentioned (See Pg 2 Lines 54-64 and Lines 82-83)..

7	Better to change this to methodology, and delete subtopics 3.1. and 3.2.	We have changed the section name and delete the subtopics 3.1 and 3.2.
8	Pg 3 Line 101: materials are hardly seen here.	We have deleted the title of subsections 3.1 and updated the methodology (See Pg 3-4 Lines 116-140).
9.	This is neither materials nor method. Better to take it to introduction.	We have moved the part to the introduction section (See Pg 2 Lines 65-71).
10	Methods: For quality of data, various session of FGD within sites need to be organized. How many FGDs were there in each regency? Also how was the quality of data information was determined or validated? Was a methodology for cross-checking or triangulation?	We approach different groups of farmers for data crosschecking (See Pg. 3 Lines 116-128 and Fig. 1).
11	Pg 3 Lines 119-120: Content analysis was employed to identify the common keywords and the subsequent themes. Then what was the results? Was the output presented?	The common keywords were presented in the results section (See Pg 4 Lines 152-155).
12	Three significant attributes of SRI are identified in this study, through our FGDs. They are compatibility, complexity, and relative advantages. There is no evidence for that. Author need to present the results supporting this statement. Otherwise, it will be regardless speculation!	We present the evidence in the section 3.1., 3.2., and 3.3.
13	Little mention was made of perceived trialability and perceived observability by the FGD participants. There should be a result	See Pg 4 lines 157-159.
14	Pg 4 Lines 155: skeptical?	We use British spelling.
15	Pg 5 Line 181. Local microorganism. What microorganism?	See Pg 5 Lines 205-207.
16	P.6 L 222" divided->divisions	We have changed the words.

3. Revisi 3



PAPER EVALUATION

Paper Title: Perceived attributes driving the adoption of System of Rice Intensification (SRI): The Indonesian farmers' view (Ms. No. OPAG-D-20-00151)

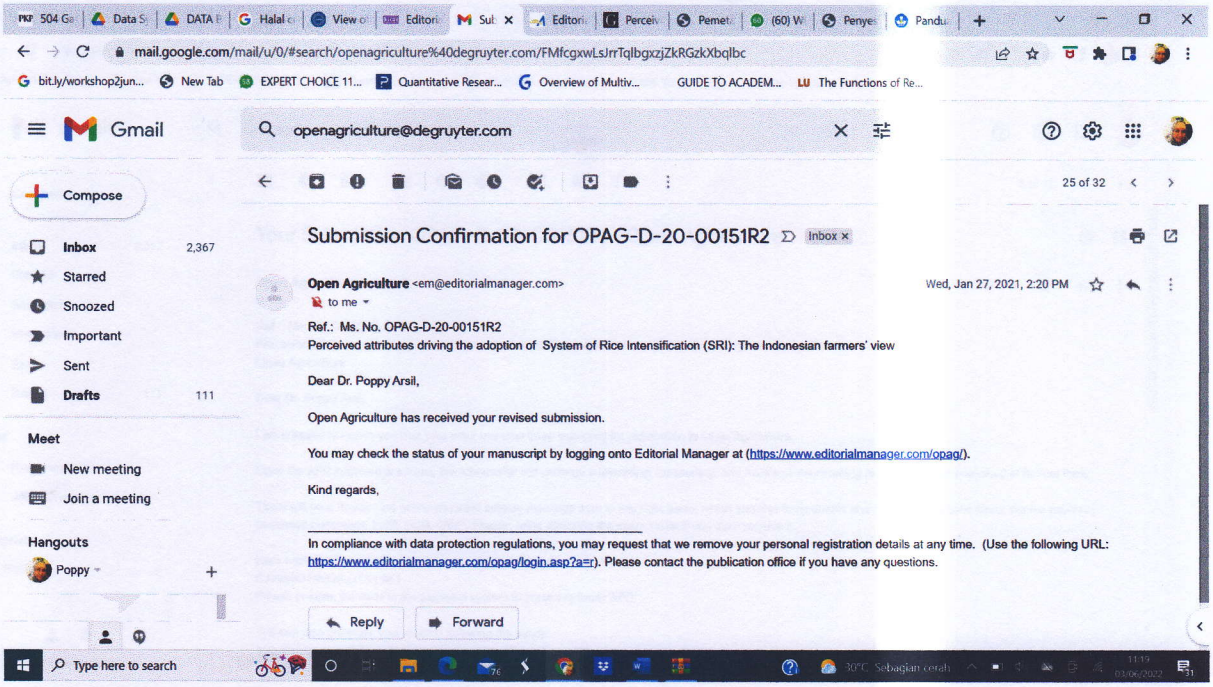
We are very grateful for information about the progress of our manuscript. We answer the editor request. Please see our detail comments, in red, in the manuscript and Table below.

No	Comments	Author's response
Editor		
1	Since there are some minor new rules applied in our journal, I would like you to add few statements in the article text: - Acknowledgments (if applicable) - Funding information.	Thank you. We added the acknowledgement in p. 8, lines 318-320. Acknowledgement This study was partially supported by Universitas Jenderal Soedirman (contract number 2448/UN 23.14/P.N./2018).
2	- Authors' contribution (according to CRediT taxonomy https://casrai.org/CRediT/ in a form of a list e.g. JZ - conceptualisation; GM - formal analysis...)	P.A. was the principal investigator designing the study, collecting, analysing the data and writing the paper.

		TYS and MB contribute to designing the study, writing and proofreading the manuscript. A. revised and edited the manuscript. ES participated in writing the original manuscript and helped to execute the study. M. collected and analysed the data as well as developed the methodology.
3	Conflict of interest	We have no conflict of interest to declare.
4	Ethical approval	We don't have an ethical clearance for this study. Before conducting this study, we intended to apply for it. However, there is no research ethic committee at the university level at this time. There are only two committees at Medical School and Faculty of Health Science to review a research proposal related to health and medicine to date. Ethical clearance in our university usually given to the research that involves the human or animal subject with high risk. Before conducting the focus group discussion, we follow the steps below: 1. We are introducing the study, including the topic and the objectives of the research and why they are selected. 2. The participant for this study is voluntary. Participants have the right to refuse and withdraw from the research at any time.

		3. The information and participant personal data will be kept entirely confidentially. 4. We are giving information about the person in charge (name and phone number) for this study. At the end of FGD, participants signed the consent forms as they received the information mentioned above (no 1-4).
5	- Data availability statement (DAS), choosing one of the following: o The datasets generated during and/or analysed during the current study are available in the [NAME] repository, [PERSISTENT WEB LINK TO DATASETS] o The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request. o Data sharing is not applicable to this article as no datasets were generated or analysed during the current study. o All data generated or analysed during this study are included in this published article [and its supplementary information files]. o The data that support the findings of this study are available from [third party name] but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of [third party name].	The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

5. Revisi 3



PAPER EVALUATION

Paper Title: Perceived attributes driving the adoption of System of Rice Intensification (SRI): The Indonesian farmers' view (Ms. No. OPAG-D-20-00151R2)

Editor comments:

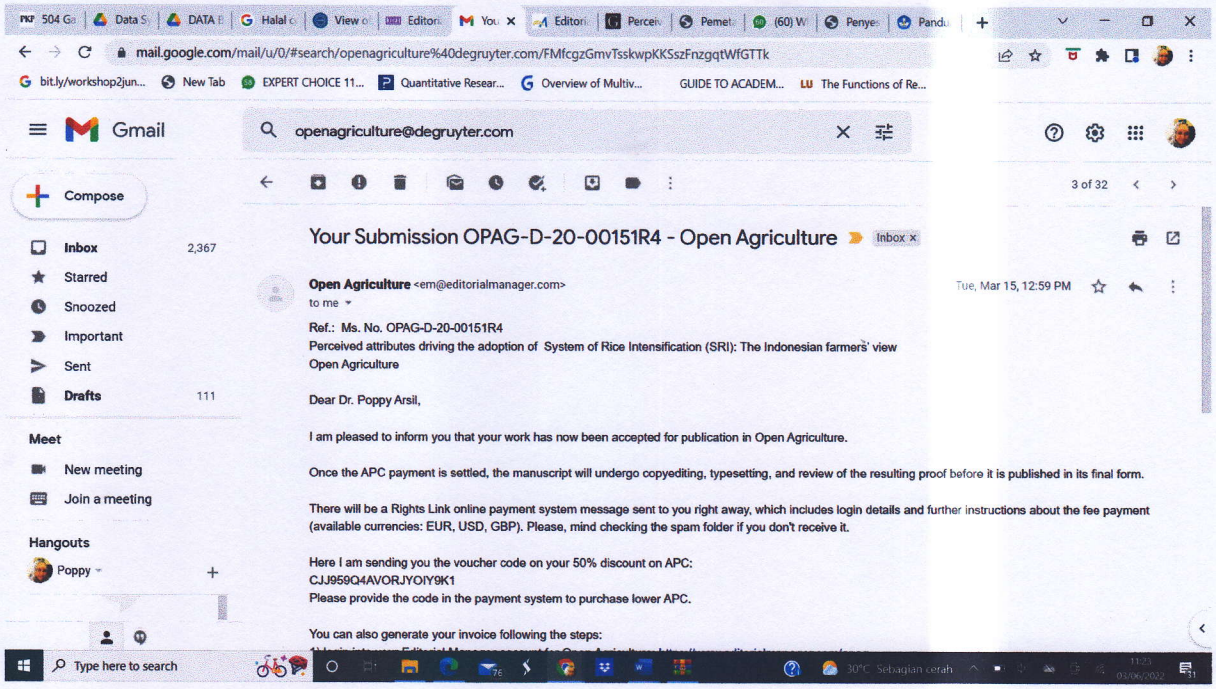
Before we accept your paper, please retype the abstract, as it is still too similar to your already-published conference proceedings: https://www.dicdbm.com/wp-content/uploads/2020/02/ABSTRACT-LIST-SCOPUS-SIAP.pdf

Authors' response

Thank you for the opportunity to revise the manuscript.

The abstract has been rewritten.

6. Accepted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