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Research Article

Local Rice Farmers Attitude and Behavior towards Agricultural Programs and Policies

Hendro Prasetyo[1*], Diah Karmiyati[2], Roy Hendroko Setyobudi[2], Ahmad Fauzi[2], Trias Agung Pakarti[2,3], Mardiana Sri Susanti[4], Waris Ali Khan[5], Leila Neimane[6,7] and Maizirwan Mel[8,9]

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Keywords | Agricultural intensification, Green revolution, Mass direction, Mass intensification, Self-sufficiency

Introduction

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Introduction

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2021; Arsani, 2020).

Attempts on boosting rice production have been proceeding for decades. The government had resolved that agricultural schemes should aim at farmers' welfare since 1960s (Anitasari, 2019). Agricultural intensification was put into operation under Green Revolution Campaign during 1980s (Davidson, 2018), where agrotechnology for optimizing soil nutrients and groundwater as well as cultivating superior cultivars of rice was involved in order to maximize land productivity (Anitasari, 2019). The campaign made it mandatory for farmers to regularly attend mass direction (*Bimbingan massal* – BIMAS) and mass intensification (*Intensifikasi massal* – INMAS) programs (Nugroho, 2018) where close guidances on rice variant selection, land management, fertilizer administration, pest control, irrigation, and post-harvest treatment were provided. As a result, Indonesia was able to suffice her own need of food between 1984 and 1989 (Anitasari, 2019). With ocus on nurturing vacant areas for rice, corn, and grain production, the intensification program in 1998 to 2000 gave benefits of not only guidance but also farming loans.

The current one, starting 2015, encourages farmers, stakeholders, and the armed forces to thrive for self-sufficiency of rice, corn, and soybean. Training, supervision, seed provision, equipment, and marketing information have been provided to achieve the target (Khodijah *et al.*, 2022; Yasar *et al.*, 2020). Yet, it is considered unsuccessful in national level (Setianto and Pabuayon, 2020).

All programs have been selecting and supplying superior varieties rather than local ones due to their environmental adaptability (Ratmini *et al.*, 2021), shorter lifespans that ensure sooner harvest (Astarini *et al.*, 2020; Paiman *et al.*, 2020), and higher productivity (Astarini *et al.*, 2020). Such qualities should be able to enhance rice yield significantly. Yet, many Indonesian farmers choose to persevere with local varieties (Hidayat *et al.*, 2020a) for a number of causes. In Yogyakarta, superior varieties are considered inapt with the farmers' agricultural schemes (Connor *et al.*, 2021). In Jember, they are deemed less compatible with certain characteristics of the local fields (Wardana *et al.*, 2018). In Tasikmalaya, they induce farmers' apprehension on their potential to disturb the environmental balance (Permana *et al.*, 2018). In Sumedang, they are less popular since the local variants already provides farmers with satisfying yield (Hidayat *et al.*, 2020a). A similar issue occurs in Malang Regency where rice farmers in Sidodadi and Banturejo villages of Ngantang district keep on cultivating local varieties of mostly *Genjah putih*, *Genjah urang*, and *Ketan hitam* with lifespans of 5.5 month (165 days). However, a study on why the farmers of this particular area prefer local varieties to superior ones has yet to be found.

Information on rice varieties planted in various parts of the country and their farmers' responses on current intensification program UPSUS PAJALE (*Upaya khusus padi, jagung, dan kedele;* Rice, Corn, and Soy endeavors), later referred to as "the program" has been found. They are indicated in reports on the program's implementation in South Lampung (Khodijah *et al.*, 2022) and Metro City (Yasar *et al.*, 2020). They are found in areport on the program's implementation and its affective factors in Sidenreng Rappang Regency (Rezky and Alam, 2019). They are insinuated in an analysis on the program's global competitiveness (Setiyanto *et al.*, 2021). They are implied in a study on the benefits of implementing the program in West Java (Setiyanto *et al.*, 2021). They are also hinted in research on factors that may induce the program's continuity in Solok (Zulfitriyana *et al.*, 2020). As of Malang Regency, a study on how the area manages the program had been in existent when this manuscript was written.

This study aims to identify, analyze, and describe farmers' attitudes and behavior to explore their insistence on growing local variant rice. Hopefully, the findings should serve as basic information for the government to plan better policies and develop further consulting and mentoring series to optimize the program for increasing rice productivity in Indonesia

Materials and Methods

This study conducted in Sidodadi and Banturejo villages of Ngantang district, Malang Regency, East Java, Indonesia in/between April to June 2020, purposive sampling method limited to local variant rice farmers only was applied to gain 52 respondents. The key informants were two village officers, three representatives of the local farming unit, one farming technician (*Mantra tani*), one farming advisor (*Penyuluh pertanian*), and one statistician from the

district office. Specifically on the respondents from Sidodadi, they had been members of the local farming unit and were experienced in growing both local and superior rice variants for 10 years.

Primary data was obtained from survey– involving Likert-scale questionnaire and interview in order to determine farmers' response, attitude, and behavior. Secondary data was acquired from literature and official records supplied by the two village offices, the Ngantang district office, and the Agriculture Agency of Malang Regency.

To perceive the association between stratification variables and respondent's view on the program, Spearman's rank correlation coefficient was employed. A multivariate analysis involving logistic regression test was then run to scrutinize how the respondents' cognitive, affective, conative, and educational aspects led to their reaction towards all three national agricultural programs

This study uses logistic regression because farmers' response, the dependent variable, is categorized into two: accepting and rejecting the program. Therefore, the regression analysis that can be used for data-dependent variables with these two categories is binary logistic regression (Adinurani, 2022; Susanti, 2021, Personal communication).

Independent variables:
- X1 = cognitive aspect
- X2 = affective aspect
- X3 = conative aspect
- X4 = Education

Dependent variable: farmer's response (accepting the program and rejecting the program)

Result and Discussion

Demographics

As farmers, the 52 respondents were in a range of ages between 36 years and 50 years, mostly middle school graduates, and all well-versed in cultivating local variant rice, superior variant rice, and horticulture with experiences of ≥ 30 years. The information is detailed in Table 1 and the percentages are illustrated in Figure 1.

All respondents were in their productive ages and actively worked. Farmers aged 51 years to 61 years were trained in all three programs, so only 15 years were familiar with them. Ones of 36 years to 50 years and 25 years to 35 years knew only the latest two, and any information on the first program might be transferred by their predecessor. Further, about half of them were small-scale farmers owning 0.5 ha to 0.99 ha of land, followed by medium-scale, micro-scale, and large scale ones, respectively.

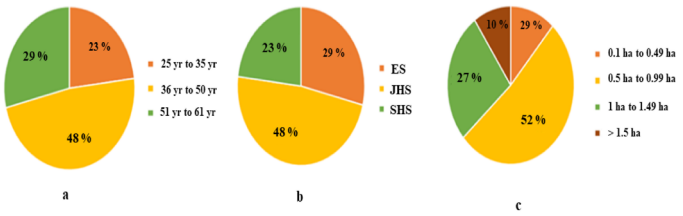

Figure 1: *Demographics of the respondents: (a) age, (b) education, (c) land ownership.*

Table 1: *Demographics of 52 respondents.*

Information	Respondent (pax)	Percentage (%)
Age (year old)		
25 to 35	12	23.07
36 to 50	25	48.07
51 to 61	15	28.85
Education		
Elementary School	15	28.85
Junior High School	25	48.07
Senior High School	12	23.07
Land ownership		
0.1 ha to 0.49 ha	6	11.54
0.5 ha to 0.99 ha	27	51.92
1 ha to 1.49 ha	14	26.92
> 1.5 ha	5	9.62

Cognitive, affective, and conative aspects

Cognitive aspect of the respondents signifies their knowledge of any agricultural program or policy issued. The indicators listed in Table 2 are points surveyed in the questionnaire.

With a rate of > 90 %, it is apparent that farmers of both villages are well-informed on every one of them the concepts, the benefits, and the consequences. This result was corroborated by the key informants during interview that the farmers generally attended counseling sessions held by offices and agricultural agencies and received guidances from their farming unit where they became members. This finding contradicts a similar study in Pinrang Regency (Halim *et al.*, 2022) where farmers were less

knowledgeable on an agricultural program regarding a different policy and another in Semarang Regency where farmers were less informed on Kartu tani, an integrated e-wallet (Jorgi *et al.*, 2019).

Affective aspect of the respondents mirrors their recognition towards any agricultural program or policy issued. The indicators displayed in Table 3 are items surveyed in the questionnaire.

With a rate of > 90 %, the respondents are generally happy to attend agricultural counseling sessions. They are also delighted to receive not only the farming loan but also the money for subsidizing their seed, fertilizer, and pesticide-herbicide purchases as additional benefits when the first program was transformed into the second one. The positive responses are in sync with other analyses on farmers' perceptions in Metro City (Yasar *et al.*, 2020) and Solok Regency (Zulfitriyana *et al.*, 2020).

Conative aspect of the respondents denotes their awareness in any agricultural program or policy issued and the importance of complying with them. The indicators shown in Table 4 are details surveyed in the questionnaire.

Table 2: *Cognitive aspect of the respondents based on questionnaire result.*

No.	Indicator	Max score	Score	Percentage (%)
1.	Farmers know and are familiar with both conventional and modern agricultural systems carried on in three programs.	5	4.63	92.6
2.	Farmes know about the two technological packages (*Panca Usaha Tani* and *Sapta Usaha Tani*).	5	4.75	95.0
3.	Farmers know that superior, pest-resistant rice variant is able to produce (6 to 10) t ha^{-1} more yield than local one in only 3.5 months despite 5.5 months.	5	4.83	96.6
4.	Farmers know that growing superior, pest-resistant rice variant is entitled to farming loan and subsidy while local variant is not.	5	4.84	96.8
5.	Farmers know that growing local rice variant means liable to penalty of plant demolition and close control from local offices.	5	4.53	90.6
6.	Farmers know that all three programs aim for national self-sufficiency and sustainability.	5	4.74	94.8
Rate				94.4

Table 3: *Affective aspect of the respondents based on questionnaire result.*

No.	Indicator	Max score	Score	Percentage (%)
1.	Farmers enjoy attending counseling sessions with agricultural advisors and are interested in such session.	5	4.80	96.00
2.	Farmers welcome the change from the first program to the second program for the loan and the production subsidy.	5	4.38	87.60
Rate				91.50

Table 4: *Conative aspect of the respondents based on questionnaire result.*

No.	Indicator	Max score	Score	Percentage (%)
1.	Farmers attend all counseling sessions and apply both agricultural technology packages.	5	4.90	98.00
2.	Farmers are experienced in growing local rice variants for ≥ 30 years for generations.	5	4.63	92.60
3.	Farmers attended counseling sessions and employed the second program for the loan and the production subsidy.	5	4.66	93.20
4.	Farmers attended counseling sessions and employed the first program for the production subsidy.	5	4.38	87.60
5.	Farmers attend counseling sessions and employed the third program for gaining information on fertilization.	5	4.85	97.00
Rate				93.68

With a rate of 93.68 %, the respondents are generally aware how advantageous the two latest programs are. They also apprehend the value of act in accordance with the standard, as they hold good attendance in counseling sessions, and understand that cultivating superior rice variants give them more time between harvest times when they can plant vegetables or other short-timed commodities to enlarge their land productivity. Despite all that, they are unable to leave local rice variants only about 25 % rice fields in Sidodadi and Banturejo grow superior rice variants. When interviewed on the disobedience, a respondent of > 50 years old uttered as cited and translated below: "Farmers in this village are one hundred percent familiar with all national programs since the first one in 1970 to 1998, the second one in 2000, and the third one from 2014 up to now. We attend counseling sessions as members of a farming unit, and we do plant superior variants. But we can't abandon the local ones. We make the seeds ourselves, and we've been planting local rice for decades because it is beneficial. We know the danger of plant demolition and we can't get the loan or the subsidy."

Another respondent came up with more comprehensive reasons as cited and translated below: "I am a local farmer and I always have local rice seeds in hand. I've been growing local variants for decades, always with good harvest because the seeds are compatible with the climate here. Any pest or disease is manageable, and when there's a problem I can always discuss it with the other farmers in a unit meeting or ask the advisor. The maintenance is easy, my parents showed me how before and I apply it every year."

The motives of retaining local rice variants are similar to ones in Sumedang considering agreeable yield (Hidayat *et al.*, 2020a), in Tabanan concerning plant and land compatibility (Astarini *et al.*, 2020), in Yogyakarta regarding farming habit (Connor *et al.*, 2021), and in Jember related to pest control (Wardana *et al.*, 2018).

It is true that local varieties can be more resilient than superior ones. Some were reported to live better in aluminum-contaminated soil due to their Al-tolerant genes (Miftahudin *et al.*, 2021), some others naturally have higher inundation tolerance (Khasna *et al.*, 2020) or specific alleles responsible for resisting bacterial leaf blight (Utami *et al.*, 2013). There is a special condition that superior variants are unable to grow well in Penebel District of Tabanan Regency that the government consents on local variant cultivation (Astarini *et al.*, 2020).

Apart from those cases, the superior variant selection for the third program had been carefully assessed as numerous reports on their advantages are present. They are confirmed to raise rice production rate for their adaptability (Ratmini *et al.*, 2021), shorter growing duration (Hidayat *et al.*, 2020b), and higher amount of yield (Paiman *et al.*, 2020).

Table 5: *Farmers' attitude and behavior towards three national programs.*

Attitude and Behavior	Land ownership							
	0.1 ha to 0.49 ha (micro-scale)		0.5 ha to 0.99 ha (small-scale)		1 ha to 1.49 ha (middle-scale)		> 1.5 ha (large-scale)	
	Frequency	(%)	Frequency	(%)	Frequency	(%)	Frequency	(%)
First program								
Decline	6	100	18	66.7	3	21.4	0	0
Accept with condition	0	0	9	33.3	4	28.6	2	40
Plant both local and superior variants of rice	0	0	0	0	7	50	3	60
Second program								
Decline	6	100	16	59.3	8	57.1	3	60
Plant corn 40 % and local rice 60 %	0	0	11	40.7	0	0	0	0
Plant local rice 60 % and corn 40 %	0	0	0	0	6	42.9	0	0
Plant local rice 65 % and corn 35 %	0	0	0	0	0	0	2	40
Third program								
Decline	6	100	27	100	14	100	2	40
Plant local rice 65 % and superior rice 35 %	0	0	0	0	0	0	3	60

Correlation between social strata and response

Table 5 depicts that although most farmers in Banturejo responded well to the first and the second programs, the micro-scale ones were unresponsive, and resulting in only 35 % to 50 % of the target was achieved. While the small-scale farmers obeyed the first program on conditions, the medium and large scale ones chose to grow both local and superior rice variants. An identical action of planting both corn and local rice was taken by small, medium, and large scale farmers to answer the second program, only slightly differ on the percentages. As of the third program, micro-scale farmers were again unresponsive, and farmers of micro, small, and medium scales completely refused to plant superior rice variants – despite knowing the risk, they secretively grew local rice. Large-scale farmers planted superior rice variants on the highest parts of their fields and hid local ones on lower parts, which was made possible by the mountainous landscape of > 20° inclination.

The defiance of farmers in Banturejo village is a social fact rooting from tradition. A respondent articulated in the interview as cited and translated below:
I have got the seeds from my grandparents and we have been planting local rice since Soekarno (the first president) era. They are easy to make and costless.

Another respondent of ≥ 50 years old explained the deception to avoid sanction as cited and translated below:
"My fellow farmers and I are members of the farming unit, and we're often persuaded to plant superior variant. But growing local rice is customary, even my grandparents did it. I was a young boy in 1970s, and I knew already that it was forbidden and the officers would yank the local rice plants off of the field and changed them with superior ones had they found out. I'm being obedient here, so I plant superior rice on the higher parts of my field and local one on the lower parts."

Rank Spearman analysis confirms the strongly positive significance in correlation between social strata and response towards national programs among farmers (Table 6). Land ownership is set to be the parameter, viewing that large land corresponds to good economical condition that leads to high social status. Convincingly, the larger the land, the better the farmer's response will be. It supports a study in Kerawang stating that economy is an important factor in farmer's participation (Warya and Anwarudin, 2018) and another in Manokwari that both social and economical statuses are influential in the farmer's partake in the third program (Anwarudin, 2017). Not only in Indonesia, household participation status in the agricultural extension program in Ethiopia is substantially dependant on the respondent's wealth status (Tewodros, 2015) and farmland size is associated with farmer's behavior di India (Mittal and Mehar, 2016), while land size is not only significantly correlated to youth participation in farm practices in Nigeria (Agboola *et al.*, 2015) but also general agricultural practices there (Victory *et al.*, 2022).

Table 6: *Correlation test result between social strata and response.*

Correlation coefficiency	Sig.	Remark
0.560	.000	Significantly correlated

Effects of cognitive, affective, and conative, and educational aspectson response

In this multivariate analysis, the logistic regression test contained cognitive, affective, conative, and educational aspects as independent variables and response on the programs as independent one. The coefficient of determination test result is revealed in Table 7.

Table 7: *Coefficient of determination test result.*

-2 Log likelihood	Cox-Snell R^2	Nagelkerke R^2
27.503	0.575	0.767

Table 8: *Logistic regression test result.*

Variable	B	Sig.	Exp (B)	95.0 % C.I. for Exp(B)	
				Lower	Upper
Cognitive aspect	2.594	0.003	13.390	2.419	74.114
Affective aspect	2.842	0.014	17.151	1.781	165.214
Conative aspect	0.368	0.415	1.445	0.597	3.497
Education level	1.984	0.019	7.273	1.385	38.200
Constant	-113.077	0.002	7.78E-50		

With R^2 value of 0.767, it is un mistakable that the farmers' choices in responding to the three programs rely on their cognitive, affective, conative, and educational aspects up to 76.7 %. The 23.3 % is of other features, such as risk taking ability, negligence, distrust, program socialization, counseling process, or other unobserved variables.

Chi-Square Goodness-of-Fit test in Hosmer and Lemeshow test is preliminary to assess the data properties, and the chi^2 value of 0.989 (P > 0.05) verifies the logistic regression model should be able to determine or predict the roles of cognitive, affective, conative, and educational aspects in the respondents' decision to answer the three programs.

The logistic regression equation model comes with response -113.077+ cognitive aspect 2.594 + affective aspect 2.842 + conative aspect 0.368 + education level 1.984, resulting in a constant of -113/077; it means that without taking the four aspects into account, it is highly unlikely that the respondents would accept the program. The constant's significance value of 0.002 (P < 0.05) denotes its importance in the response. All variables in the regression line equation are positive, reflecting their positive impacts in the response. The conative aspect value of > 0.05 shows that the aspect is the least substantial of all (Table 8).

Knowledge is the leading factor in this study, and it confirms a research in Sidenreng Rappang in implementing the third program (Rezky and Alam, 2019). On the other hand, an observation in Tulang Bawang has concluded that knowledge is insignificant in the farmers' perception (Irsa *et al.*, 2018). Logically, more information leads to better understanding. Knowledge and understanding on a scheme and the environment are crucial for a farmer to partake in the scheme (Adam *et al.*, 2021; Guangyin *et al.*, 2022).

That affective aspect is influential has never been reported before. Linked with individual attitudes and personal values towards counseling sessions and the programs, a positive rate represents positive attitude in general. The constructive information gained in the sessions regarding the programs should positively shape the farmers' response.

Education level matters in farmer's ability to respond to the programs positively. It has also been found in Burton (2014) that age and education signify farmers' behavior, in Kariyasa and Dewi (2013) that education is paramount in adopting agricultural management including superior variant use, in Irsa *et al.* (2018) that education correlates with farmers' perception on the third program, in Lastra-Bravo *et al.* (2015) that education influences farmers' involvement in the government programs in Europe, and in Barnes *et al.* (2019) that European farmers are likely to implement government program when finished with their full-time education. Education maintains farmers' ability to comprehend complex topics and act accordingly. The higher a farmer's formal education level is, the greater his/her chance to contribute in an agricultural program (Burton, 2014).

Social behavior

The respondents' attitude and behavior towards the programs obtained from questionnaire and interview are social facts, and they are associated with the farmers' social interaction. Social interaction suggests individual behavior in a community (Christakis and Fowler, 2013). The paradigm of social behavior developed by B.F. Skinner explains it through psychological approach (Vargas, 2017). A social behavior is the result of repeated attitude (Kwasnicka *et al.*, 2016). As of the respondents, their rejecting the programs and growing local rice variants had happened three times.

Social interaction is highly regarded in the respondents' community. In group discussions, they communicate with other farmers and make their decisions as per local tradition and custom, which guarantee repetition. Intention is key to an individual behavior (Ajzen, 2020). Along with behavioral control and habit, intention to act is vital in a behavior (Klöckner, 2013). Such intention depends on positive individual attitude on a certain behavior, individual perception on subjective norms, and the extent of individual consciousness to personally control the attitude (Sawitri *et al.*, 2015).

Social institutions

Social institutions in the respondents' society are educational, religious, political, economical, familial, and traditional ones. While educational and political institutions are government dominated, religious one is driven by Islamic organizations. Farmers control their economical institution (to meet their needs and achieve personal, familial, and social welfare) and familial one (to regenerate) as well as traditional one (to preserve local events and custom). Serving as a means to comply with social and familial needs, Razak and Utami (2020) noted four aspects in social institutions: Basic needs, a well-structured organization, way of acting, and bond. Although people recognize their roles and expect them to function, such is not the foremost aim (Triwiyanto, 2021).

Functional structure and structural conflict

A social structure consists of entities that form a society. Farmers with larger parts of land are considered wealthy, and they are also active in other professions as officers, religious figures, or local figures. These farmers are highly regarded by others, and they grow superior rice variants in addition to local rice and vegetables. The rest are micro-scale farmers and farm labors.

The analysis confirms three main structures of communal, agrarian, and local authority in the society. Communal structure is relatively small and homogenous, characterized by minimum work distribution, strong social attachment, and traditional primary bond based on family, bilateral organization, neighbor, and religion. They help each other in needs and talk over problems to avoid conflicts in both home and field. Agrarian structure leads to similar commodities with a tendency to market. Farmers send their produce to nearby cities on demands. Related to local government, local authority structure refers to organizational one. Since it is official, the communal structure is of a lower standing. The chief is personally elected by the society due to his/her competence when leading a certain part in the communal structure, making it impossible for the person to abandon local tradition and custom. This is deduced to be the reason behind the failing programs in the area.

Parson's theory on functional structure states that a harmonious, balanced society is achieved when both local and national institutions are able to keep its stability (Sidi, 2014). It also underlines the four pillars of a functional structure to be adaptation, goal attainment, integration, and latency. The respondents see local rice variants as well-adapted to local conditions, proven by their sufficient amount of yield and pest resistance. Their manageability and being low cost grant farmers optimum time and money, which is the goal of their farming activities. Local rice farming has been customary for decades and already integrated in their lifestyle that local wisdom and tradition revolves around it. The respondents' insistence on defying the programs is evident to their belief that further potentials of local variants will be discovered as long as they keep growing them.

Internal and external factors in farmers' attitude and behavior

Internal factor: Social contacts are not necessary physical, as communication is a form of one (Pratama, 2021). Social interaction in the community allows farmers to inspire each other, particularly during group discussions among farming unit members. They regularly share their knowledge and experiences, which are often similar. The uniformity of their way of thinking and feeling elicits solidarity, leading to the same action.

Attitude is one's way, intent, or response on a certain object or situation (Vargas-Sánchez *et al.*, 2016) formed in a collective cognition and sentiment positive or negative and is influential in one's change of behavior (Ajzen *et al.*, 2018). The respondents' interaction with both groups of rice variants and their social interactions may change their attitude or trigger a new one. A product of experience, reward and punishment defines attitude (Aspandi, 2020). Rewarded attitudes get stronger and punished attitudes get weaker or cease to exist when repeated, the strong attitudes should become habits (Kwasnicka *et al.*, 2016).

External factor

Government intervention in the studied areas is the first factor it was pungent during the first program due to the central direction, but not as intense in the second and third ones regarding mandated work distribution to regional and local control. With less rigorous supervision, farmers get more chance to plant their preferred commodities.

The next one is organizational intervention. Compared to educational and religious purposes, ones directly affect economical, familial, and cultural aspects are more crucial. When growing local rice variants is more beneficial, agreeable by the family members, and meets the custom as everyone does it, farmers find it convenient.

Another factor is private intervention, where companies and entrepreneurs are ready to purchase the goods. Conducting their businesses in cities, the customers line up even to preorder since seeding period. They are also ready to pay higher for local rice than superior one.

Cultural intervention is fourth factor. Local events of *Bersih desa* (clean up the whole village post-harvest to ward off negative energy), wedding, *Khitan* (male circumcision) and others involve large amounts of

local rice dishes and offerings as part of the tradition.

The last factor is natural intervention. Lying on a mountainous terrain at 800 m above the sea level and field inclination of > 15 %, local rice variants with average height of 100 cm can get more intense sunlight than superior ones with average height of 60 cm, allowing local rice to grow better and attain more yield.

Further research can be applied by using organic rice cultivation should be the best approach that suits local rice farms in Sidodadi dan Banturejo villages of Ngantang district, Malang Regency, East Java, Indonesia perusing local wisdom and resources (Ekawati and Purwanto, 2012; Ngongo *et al.*, 2022; Vincevica-Gaile *et al.*, 2021a). Administering organic-based pesticides (Ekawati and Purwanto, 2013; Prihandiani *et al.*, 2021; Riah *et al.*, 2014; Roeswitawati *et al.*, 2021, 2022), organic fertilizers (Budiono *et al.*, 2021; Ekawati *et al.*, 2014; Goenadi *et al.*, 2021; Purbajanti *et al.*, 2019; Vincevica-Gaile *et al.*, 2021b), and biological fertilizers (Adinurani *et al.*, 2021; Ekawati, 2019; Muhammad *et al.*, 2021; Purbajanti *et al.*, 2016; Sukmawati *et al.*, 2021; Widjajanto *et al.*, 2017) is the realistic steps to conduct. Its implementation should result in healthy rice production, where a boost in yield quantity and financial profit is balanced with robust soil due to minimum pollution (Budiono *et al.*, 2019; Chandini *et al.*, 2019; Dazzi and Papa, 2022; Lal, 2016; Riastyadiningrum and Ekawati, 2020; Tahat *et al.*, 2020).

In addition to agricultural waste and cattle manure, organic fertilizers may be of any organic waste, such as household leftovers. For better results, the anaerobic decomposing method in a communal- or household-scale digester should be employed to support the aerobic one (Setyobudi *et al.*, 2021; Susanto *et al.*, 2020a, b). Such a biogas digester doubles the benefit for society and the environment by providing clean, renewable energy, minimize global warning and producing two types of organic fertilizers, i.e., liquid and solid (Abdullah *et al.*, 2020; Burlakov *et al.*, 2022; Prespa *et al.*, 2020). Ideally, this biogas digester should be installed with inlet pipes from excreting disposal to septic tanks in each household (Setyobudi *et al.*, 2021; Susanto *et al.*, 2020a, b; Williams *et al.*, 2022). Since there is a possibility of decomposition fluctuation due to various feedstocks, several researchers recommended a two-stage digester to overcome the problem (Adinurani *et al.*, 2017; Setyobudi *et al.* 2013).

Conclusions and Recommendations

The rice farmers in the study area are generally well informed on the agricultural programs and policies of cultivating certain superior rice variants launched by the government as well as willing to attend agricultural counseling sessions. They also understand entitled advantages and additional benefits of implementing them. Their decision to grow local rice variants thus defying the regulation despite the knowledge on the penalty, resulting in low grade in program implementation is due to personal concerns (low production cost, low maintenance, pest manageability, ample yield), social preferences (tradition), and external supports (low control, high demands).

Attempts to optimize the latest program should involve more dynamic yet persuasive approaches starting from farming units as the basic tool of agricultural information. Communicating with new people expands one's horizon, so it is recommended to meet the farmers with superior rice variant farmers, field agricultural advisors, agricultural officers, even university students and alumni from various places. When the local rice farmers hear their success stories repeatedly, it should convince them to lean on superior rice variant growing. Such talks may also invite their empathy and solidarity towards the less fortunate citizens who are unable to afford rice due to limited supply.

Novelty Statement

Research on the motives behind the Indonesian farmers' insistence on planting local rice varieties has been conducted in several locations, *i.e.*, Yogyakarta (Connor *et al.*, 2021), Sumedang (Hidayat *et al.*, 2020), and Jember (Wardana *et al.*, 2018). Other observations on how Indonesian farmers implemented the national agricultural program Upsus Pajale have also been carried out in South Lampung (Setiyanto, 2021) and metro city (Yasar *et al.*, 2020). However, research on farmers' refusal to grow superior rice cultivars in Malang, East Java, particularly in Sidodadi and Banturejo villages, has yet to be found. This study aims to identify local farmers' attitudes and behavior towards the current and previous national

programs in the sites mentioned above. The response percentages and their factors have been analyzed by combining quantitative and qualitative approaches, and the reasons behind their perseverance to grow local rice varieties have been explored. The findings should serve as basic information for the government to plan better policies and develop further consulting and mentoring series to optimize the program.

Author's Contribution

Hendro Prasetyo: Conceptualized and designed the study, performed literature search, manuscript preparation.
Diah Karmiyati: Research supervision, elaborated the intellectual content, performed the literature, and manuscript review.
Roy Hendroko Setyobudi: Elaborated the intellectual content, performed the literature search, manuscript review, manuscript revision, administration, Grammarly check, Turnitin check, and guarantor.
Ahmad Fauzi: Elaborated the intellectual content, manuscript editing, and manuscript review.
Trias Agung Pakarti: Manuscript editing and English scientific writing.
Mardiana Sri Susanti: Data acquisition, data analysis, and visualization.
Waris Ali Khan, Leila Neimane and Maizirwan Mel: Elaborated the intellectual content and manuscript review

Conflict of interest
The authors have declared no conflict of interest.

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