

PUPM Program: Investment to Increase Market Access and Food Security, a Case Study on Rice-farming in Indonesia.

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Abstract

This paper addresses Pengembangan Usaha Pangan Masyarakat (PUPM) program implementation and its contribution to local food security. Based on a qualitative method analysis derives from a farmer, a chief of farmer group, an agricultural extension worker, and management of Toko Tani Indonesia (TTI), this research sheds light on the TTI activity, the efficiency of TTI in shortening of rice supply chain, and the program contribution in food security: food availability and food access. The result indicates that the program had definite success in shortening the supply chain, even though it still could not influence the stabilization of supply and market price. The program benefits farmers because now they can get income from rice farming and help the community at the same time because they can buy or access rice at a low price compared to the market. Taken together, the research findings highlight the importance of standardization of the crop and provide more TTI numbers with more volume, and design the criteria for the consumer to contribute to poverty alleviation and local food security at the same time.

Keywords: PUPM program, TTI, food security, rice, Indonesia.

1. Introduction

In the early days of Indonesian independence in 1945, Indonesian land was still very fertile for cultivating both rice and non-rice; notably, the primary staple food included rice, corn, soybean, cassava, peanuts, as well as the need for fish and meat. The Government was unable to comprehensively fulfill food needs, and even at that time, there was a high inflation spike. The Indonesians were still consuming food based on the local staple foods of each region; those from Irian Jaya and Maluku were accustomed to consuming sago, the Javanese consumed rice, while corn was the staple food in Sulawesi and Nusa Tenggara Timur. Staple food continued to vary, and people consumed local food based on the availability of local crops. During Soekarno's reign (from 1945), the Food Quality Improvement Program was initiated for food diversification. It involved intensification, extensification, and loans for farmers, despite not fully realized (Isma'il, 2014).

In the era of New Order (1966 onwards), the Government made efforts to uniform the basic food that must be consumed by the people throughout Indonesia. With this program, people began eating rice as the primary food. People outside Java at that time did not consume rice. The program made people change the pattern of food consumption gradually.

This led to the rising demand for rice in the country (Isma'il, 2014). After 1998 (Reformation era), the Government performed plenty of decentralization of authority to regency governments. This was in line with several food policies aimed at reviving local food diversity.

Nevertheless, the society was widely getting used to consuming rice as staple food, and it was still difficult to replace. Therefore, rice farming turned into a livelihood for most Indonesians. Prawiro (1998 cited in Kamrussamad *et al.*, 2018) even asserted that the Indonesian economy might be as well regarded as the rice economy.

In recent years, the Indonesia's top agriculture priority has been rice self-sufficiency, where the Government provided farmers significant market price support and fertilizer subsidies (FAO, 2017). Indonesian rice prices were higher than those in Vietnam or Thailand by 50-70%, which was a heavy burden for 92% of Indonesians who were net purchasers of rice (World Bank, 2016). Therefore, to maintain the stabilization of food supply and prices, the central and regional governments held the controlling responsible for the availability of primary and strategic food items, such as rice, throughout Indonesia. Both staple and vital food items must be available in adequate quantities, of good quality, and at a

reasonable price to maintain affordability at the consumer level while protecting income of producers. Following this issue, the Ministry of Agriculture then implemented *Pengembangan Usaha Pangan Masyarakat* (PUPM) program, based on Indonesian Minister of Agriculture Regulation Number: 06/ KPTS/ KN.010/ K/ 02/ 2016 on general guidelines of PUPM in 2016, with the purposes: (1) absorbing basic and strategic food items (such as rice) at affordable prices and benefit farmers; (2) stabilizing food supply and prices; and (3) supporting easy access for consumers to strategic food items at reasonable and affordable prices. This program was implemented since 2016 for 500 Indonesian Farmer's Shop (TTI) across 32 provinces, then another 7 provinces in 2017 (399 TTI), and additional TTIs in 2018; therefore the total TTIs is 1,156.

To execute this program, since 2017, a capital fund of 160 million rupiah/year was given to each joint farmer group (*gapoktan*). *Gapoktan* that received aid from PUPM program is called LUPM (*Lembaga Usaha Pangan Masyarakat*). The fund (100 million rupiah) must be used to purchase rice grain from their members and surrounding farmers at a higher price, above the highest retail price, or *harga eceran tertinggi* (HET) regulated by the Government. Financial aid worth 60 million rupiah was channeled for operational funds. At this step, LUPM is called farmer shop or *Toko Tani Indonesia* (TTI), which continued developing in the second year as TTI under guidance or *TTI pembinaan*, which only received operational fund. In the third year, the LUPM should be independent without further funding (Anugrah & Wahyuni, 2019). Figure 1 below shows PUPM model.

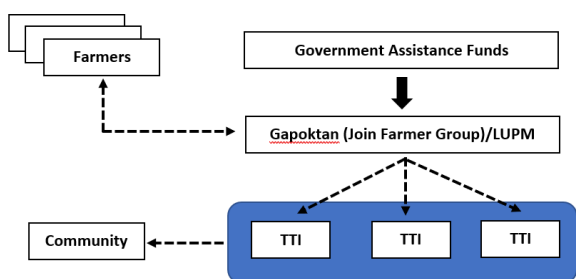


Figure 1. PUPM Model

A TTI from the program was running in Bunggang village, Sekayam sub-district at Sanggau district, starting from 2018. They bought rice from farmers and sold it to the community at a lower price (compared to markets). This program in this area was aimed at providing the community more access to rice at affordable prices and to absorb their grain at reasonable prices concurrently. In this study, the implementation of PUPM as an effort to increase market access for the farmer and its relation to local food security were assessed with the following research questions: (1) how was the local rice farming; (2) how was the TTI activity as a collective action; and (3) How was the PUPM program supports market access in terms of the efficient of TTI in the rice supply chain, and the efficacy of the program in ensuring food (rice) availability and access.

2. Materials and Methods

The qualitative data were analyzed using inductive and descriptive analyses to retrieve in-depth and accurate data adjusted to the condition in the field (Neuman, 2006). The non-probability sampling was applied via the purposive sampling method to select the informants.

The data collection techniques used were in-depth interviews as the primary data and assessment of documents as the secondary data. Field information was gathered from 4 informants; a farmer, a chief of farmer group, an agricultural extension worker, and the management of farmer shop, all via in-depth interview. This research is in Bunggang village, Sekayam sub-district, an inter-country border between Indonesia and Malaysia. This village had a TTI, a joint farmer group. Data collection was conducted both directly and indirectly from April to May 2019. As part of the field research time, the data collection period gathered both primary data (in-depth interviews) and secondary data (other additional documents).

This study analyzed food security based on several indicators to assess food availability and food accessibility at the community level. Some indicators were used during interviews to explore the implementation of the PUPM program while simultaneously measuring food availability and food accessibility in the informants' own words. The food system was analyzed from three of four categories of food system activities, as prescribed by Erickson (2008), namely: producing food, processing and packaging food, as well as distributing and retailing food. Then the importance of market access, collective action, and their relation to local food security was also included. The stages of data analysis employed in this study had been based on those prescribed by Neuman (2006), see figure 2 below:

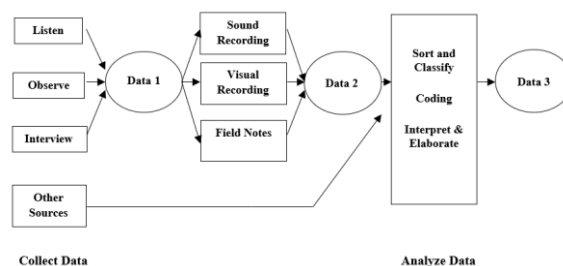


Figure 2. Step of the Research and Data Analysis Process (Modified from Neuman, 2006)

3. Results and Discussion

3.1. Local rice farming

3.1.1. Farming Area

There was more than 470 ha of agricultural land in Bunggang village (the study area), while 700 ha of non-productive land was still available at the time of this study. The paddy field managed by the farmers was only 125 ha. Farmers in the village had no shortage of water, and the water debit was still adequate to meet the needs of irrigation despite drought season. This irrigation irrigated more than 270 ha of land, and the drainage channel was more than 13 km away.

3.1.2. How many households are operating rice farming in the village?

All farmers in this area planted paddy for their consumption or sold in a small amount directly to consumers, while most of them also grew cash crops. They varied their crops to deal with price volatility, which can affect their income. Paddy was planted to fulfil their needs, along with some vegetables crops in between their cash crops plantation. They avoided planting only one type of crop, which may reduce the variety of food available for the household and may increase the risk of crop failure. Farmers typically select crop mix to provide for their own food security and for the maximum return on scarce resources (Von Braun & Kennedy, 1986). Hence, the farmers were clueless themselves about the type of farmers they were. It was difficult to exactly determine households that operated paddy farming. Upon estimation from the data retrieved from the agricultural extension agency, there were 16 farmer groups in the village with 402 households. This was equal to 42.63% of the total households (n=943) in the village. Since the agency counted only the formed groups, at least 42.63% of households in the village were involved in paddy planting. The calculation of their production for subsistence consumption and sale was initially omitted for this village. However, 86% of the rice yield was consumed and the remaining 14% was sold to TTI or directly to consumers.

3.1.3. How many farmers gain income from cash crops?

There are three types of farmers in this area based on income were: (a) farmers who depended only on farming activities; (b) farmers who gained income both from farming and non-farming activities; and (c) farmers who earned income from off-farm activities (farming only for subsistence consumption). Farmers who gained income from farming activities gained most of the revenue from cash crops or vegetable plants. Only 1-2% of rice was sold directly to consumers prior to the PUPM program. After the program was deployed, the amount of rice production sales increased to 14% in 2019 and was expected to continue growing in the future upon the sustainability of the TTI activity. Income from paddy farming, which was only harvested once a year in this area, did not exceed 5% of their total revenue. Hence, for farmers who earned an income of 100% from farming activities, 95% of their income was derived from cash crops. Figure 3 illustrates the location of the study area.

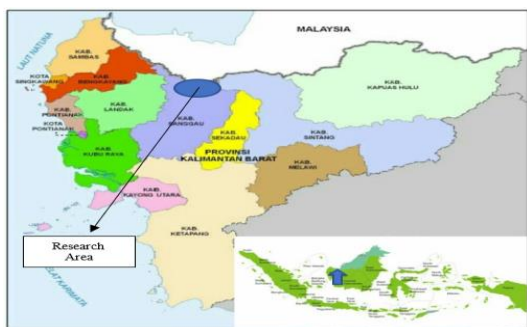


Figure 3. Bungkang Village in Sekayam Subdistrict as the Research Area (Purnawan, E., & Brunori, G., 2022)

3.1. Farmer Shop (TTI); Collective Action and Entrepreneurship

In Indonesia, the position of smallholders is still fragile due to the lack of initiative to take collective action. Therefore, support and encouragement from the Government are still very much needed. In the PUPM program, strengthening farmer groups and strengthening the market for agricultural products is carried out to encourage entrepreneurship by establishing and supporting TTI. This is done considering that small farmers are gradually losing control over the food supply chain (Knickel et al., 2008). This is due to a lack of support from policies and exacerbated by retailers' increasing power, which results in pressure on producer prices (Konefal et al., 2005; Peter et al., 2006). In Europe, for instance, the collective action of farmers has been taken as a response to the weak position of smallholders in the food system, which has had a positive impact on the development of the agricultural sector and rural development (Knickel et al., 2008). Farmers have made various efforts to develop alternatives, including the initiation of cooperatives in terms of production, processing, and marketing (Ploeg et al., 2002).

Strengthening farmer groups is essential because farmer groups can penetrate the domestic market, especially supermarkets, increasing and continuing to grow in developing countries, especially in urban areas (Weatherspoon and Reardon, 2003). According to Markelova et al. (2009), small farmers have the potential to meet the needs of economies of scale (volume) collectively as a group, of course, by doing good coordination, in response to the tendency of most buyers who prefer to deal with large and medium farmers. Moreover, collective action can address new challenges and develop appropriate marketing channels; generate economies of scale in the production and commercialization phases; achieve production efficiency, reduce marketing and commercialization costs; facilitate accessing inputs and outputs; support more straightforward access to market information and financial and human capital resources; ensure the achievement and effective use of new technologies and social innovation; and can improve food quality, safety, and traceability (Corsi et al., 2016).

In this program, the leading supplier rice farmers consisted of 4 group farmers in 2 hamlets; Maju Terus (25 farmers), Sejahtera Bersama (25 farmers), Semangat Baru (25 farmers), and Muara Kopa (15 farmers) groups; a total of 90 rice supplier farmers in Berungkat and Rintau hamlets. Both these hamlets are part of the Bungkang village administration in the Sekayam sub-district. In this program, they had met the target of 34 tons in 2018, while 27 tons until June 2019 (at the time of this study), in which they had to fulfill up to 50 tons by December 2019.

The TTI managed by the chief of joined group farmers was assisted by the Government through PUPN funds to ascertain food availability, in this case, rice availability. The goal is to keep rice available at an affordable price to become more

accessible for the community. Hence, they were given financial support to buy grain and sell rice to the community at an amount determined by the Government. The grain was obtained at the farmer's price and then sold at government price. The target price of grain from the Government initially was 4,800 rupiah, which the farmers refused to sell their grain. Finally, in a meeting, the farmers agreed upon a price, which was 5,500 rupiah. Indeed, the cost of this grain was varied; the price of grain was only 4,300 rupiah in Sambas and Kubu Raya regencies because the farmers were paddy farmers. As for the study area, the farmers planted many commodities, such as palm oil, pepper, and rubber. Thus, rice may not be cultivated if grain prices are low but cultivated for a suitable price.

This effort was made to create an entrepreneurial culture of small farmers where "farmers produce for the market rather than trying to market what they produce" (Lundy et al., 2002) to thrive in a competitive local and global market economy. An entrepreneurial farmer can be characterized as one who invests in the agricultural sector, intending to profit while developing agriculture in a sustainable manner (Opolot et al., 2018). Improving the commercial status of agriculture requires the development of entrepreneurial competencies and the organizational capabilities of smallholder farmers (Opolot et al., 2018). The entrepreneurial and corporate skills of farmers have been recognized to play an essential role in increasing agricultural productivity and market access to achieve better livelihoods through improving food security and household incomes (Diaz-Pichardo et al., 2014).

Initially, the TTI received financial support worth 160 million rupiah, 100 million to purchase grain, and 60 million for operational costs (e.g., buying bags and grinding process). After the 34-ton contract had expired, the money turned out to be 101 million rupiah; with 1 million to cover profit and loss of all operational costs. The target was to supply 34 tons of rice in 2018 to the community within the area. So, with 160 million rupiah, they bought and sold 34 tons of rice in 2018. The grain from farmers in the area, after manual processing, yielded 54% of rice. Therefore, one quintal of grain had generated 54 kg of rice.

When milled using a machine, the yield was 58-60 kg of rice. Two mills were available in this hamlet; the first is a large mill from government assistance with a capacity of 5 tons per day. The second is a community-owned mill that has a smaller size. The large milling machine required dry grain approaching 5 tons, or else energy was lost with merely 200 or 300 kg of grain. The small device had a capacity of 500 kg to 1 ton per day with an expenditure of up to 500 rupiah per kg. A large machine was not used because the land for drying 5 tons of unhusked rice was unavailable, except for small land. The management asserted they would use a dryer with a capacity of 4 tons in the future to enable the use of a large milling machine.

In 2019, the remaining fund was 101 million rupiah, plus 60 million rupiah for the target of 50 tons. The TTI in Sekayam sub-district was in its second year (development stage), and

no government aid is supplied for the third year (independent stage).

Morgan et al. (2010) stated that improving competitiveness and agricultural productivity requires strategic planning, identification of (market) opportunities, relationship building, marketing, and value chain development. In addition, several other competencies related to product development, record-keeping, organizational function improvement, and diversification are essential in enabling farmers to create new value through creativity, apply social capital, and take risks in adopting and using new technologies (Chegini & Khoshtinat, 2011; Ezeibe et al., 2012). This is what underlies their plan to continue the business independently after the exit program. According to the management of the TTI, they planned to continue their activity after the support ended. The action would still be the same; absorbing rice grain from farmers, processing it, and selling it to the community below the market price, despite the slight price difference. The market sold rice at 13,000 rupiah per kg, while TTI sold their rice at 12,000 rupiah per kg, 10% lower than the market price.

3.1. PUPM Program, Market Access, and Local Food Security

Small farmers play a two-way function as producers and consumers, where they access agricultural inputs and sell their crops to the market, and access food and other necessities in the market at the same time (IFAD, 2013). Therefore, to strengthen local food security, good food distribution and access to food must be improved (Tembo & Simtowe, 2009). The twofold direction between market access and food security is the safer a farming family's food security, the stronger the access to markets; conversely, access to markets ensures better food security (Corsi et al., 2016). Sadler (2016) mentioned that one critical factor that determines food security in the rural area is the availability and accessibility of markets, as a combination of calculating travel time, distance, and transportation costs (Baltenweck & Staal, 2007), where there are many actors involved, such as processors, traders, and retailers (BIRTHAL & JOSHI, 2007).

This section will explain the efficiency of TTI on the rice supply chain and its impact on local food security to know how essential the program is in providing new market access for small family farms and contribute to local food security in food availability and access aspects.

3.1.1. The Efficiency of TTI on Rice Supply Chain

There is no difference in time or energy between TTI and the conventional rice market in producing rice. However, there is significant variance in production cost as TTI is a subsidy program with special requirements (medium-level rice packed in plastic with distinctive TTI logo).

Table 1 below lists the cost analysis to produce a kg of TTI rice in Bunggang village.

Table 1. The Process and Price to Produce TTI Rice

No	Activity	Price/ Wage (IDR/kg)
1.	Grain	5,500

2.	Transport from field	150
3.	Drying the grain	350
4.	Milling	500
5.	Sorting	100
6.	Packing	100
7.	Transport to TTI	100
Total		6,800

Source: own survey

Referring to Table 1, the price to produce 1 kg of TTI rice was 6,800 rupiah. Hence, by selling the rice at 9,000 rupiah per kg in 2018 and 2019, the TTI had already gained 2,200 rupiah per kg of rice. In the conventional market, the rice price was 13,000 rupiah per kg; TTI offered cheaper rice for the community, although the supply chain of rice in the traditional Indonesian market consisted of seven actors (see Figure 4).

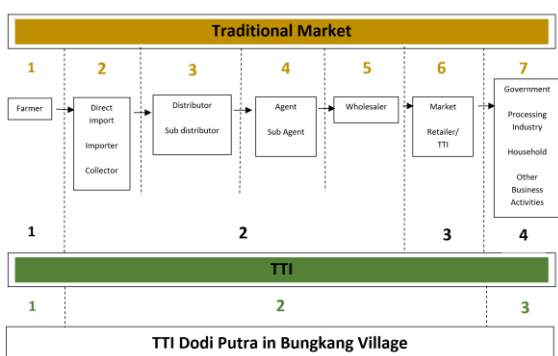


Figure 4. Rice Supply Chain in Traditional Market Compared to TTI (Modified from Anugrah & Wahyuni, 2019)

Typically, the rice supply chain through PUPM is composed of 4 actors, namely farmers, LUPM, TTI, and consumers (Anugrah & Wahyuni, 2019), but the supply chain through TTI Dodi Putra only had 3 actors: 1) Farmers as producers; 2) TTI that buys the grain, process the grain into medium rice, becomes rice retailer to consumers; and 3) Consumers. The TTI program had shortened the rice supply chain from 7 to 3 actors; the multi-functional TTI caused the decrease of actors.

3.1.4. The Impact on Food Security

1) Food Availability

As for rice production, apart from this combined four groups, many other farmers who had wanted to supply rice but sold it at the market price of 13,000 rupiah per kg. In Rintau and Berungkat hamlets, per ha can reach 5-6 tons per harvest due to the conventional planting system, such as selecting a proper time for grazing and start planting and the appropriate use of seeds. The point here is adherence to the technical instructions from the agricultural instructor, such as how to grow rapidly and practically to generate optimum yield.

In the Sekayam sub-district, the TTI usually supplied 3-5 tons in a month sold directly to the community. During Ramadan or before Eid Fitri, 5 tons of rice was provided. The average consumption of rice in the area was 8 kg per month for a person. So, they could multiply the population in a place like the Sekayam sub-district with 8 kg of rice. The total amount refers to the estimated need for rice in the region. Indeed, 8 kg a person per month is the national standard used in Indonesia due to high rice consumption. This program was deployed for two years; the first year in 2018, they made a contract with the Government for 34 tons of rice, while in 2019, the contract was 50 tons of rice until the end of 2019. Table 2 shows the estimation of domestic rice needs and the availability of rice from the program (a TTI).

Table 2. Availability of rice from the program

No	Area	Population	Needs of Rice	Rice Supply (TTI)	
				34 ton (2018)	50 ton (2019)
1.	Bungkang Village	2,982 (BPS, 2018)	(x 8 kg x 12 months) = 286,272 kg	11.87 %	17.46 %
2.	Sekayam Sub-district	35,141 (BPS, 2018)	(x 8 kg x 12 months) = 3,373,536 kg	1 %	1.48

Source: own survey

1) Food Access

The TTI bought rice from farmers, especially group farmers. If group farmers did not meet the target, rice was bought from other villages, sub-district, or district farmers (see Figure 7.1). In 2018, for instance, they supplied demerit grain and rice from Sambas and Kubu Raya districts. They sold rice to people around here in Bung kang Village, around Sekayam District, and even to Beduwai and Noyan Districts. Buyers also came to buy the TTI, as this rice was not sold at stores but to farmers and other communities. Following the objectives of this program, which is to meet the needs of rice

for border communities, it can only be sold to the community members, with a purchase of less than 100 kg per household.

The TTI absorbed rice grain for the need of the community to be sold at a price set by the Government. This PUPM program is a community agricultural business empowerment program. Farmers sold their grain, while the TTI processed wraps and sold the rice to them again (resold to the community or other communities). So, rice farmers were able to sell agricultural produce to TTI in large quantities at each harvest (see Figure 5). They could earn an income from selling grain; previously, farmers only planted paddy for their own needs and not for sale or sold it in small amounts directly to customers. As Gabre-Madhin (2009) asserted, with good market access,

small farmers whose agricultural orientation is to earn income will generally have a better food security status than those who farm only to fulfill their family's food needs (Gabre-Madhin, 2009).

Moreover, this condition stimulated the productivity of paddy farming in the study region as they attempted planting twice and thrice a year to increase productivity. Apart from selling crops, they could calculate the amount of rice for sale and family consumption. In the past, the farmers only planted for household needs. So we can see the importance of this program in providing new market access for local small family farms. The availability and market access for small farmers are essential to support their farming activities sustainability. Moreover, it also motivates farmers to farm for subsistence purposes and gain income at the same time from farm activity.

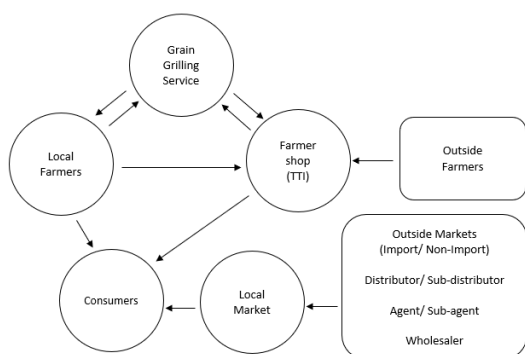


Figure 5. Rice Flows in Berungkat hamlet (& Sekayam sub-district)

4. Conclusion

This program ascertained the stabilization of rice supply for communities residing at the border area to gain more access to rice as the staple food at an affordable price while simultaneously absorbing their grain with financial support through joint farmer groups or TTI. The program had definite success in shortening the supply chain. However, it displayed that the contribution of supply from TTI did not influence the stabilization of supply and market price, mainly due to the temporary financial support for the TTI.

The PUPM program benefited the farmers because they could earn additional income from paddy planting, in which they only grew paddy for self-consumption in the past. Second, the PUPM program benefited the community, as they could buy rice at a low price (9,000 rupiah per kg, compared to 13,000 rupiah per kg of rice sold in the market). This price difference enabled the community members to buy other food items, such as oil, eggs, vegetables, fish, meat, etc. Anyone may buy this rice with a purchase amount of less than 100 kg per household, except traders and wealthy consumers who wish to buy in large quantities.

The challenge faced by TTI in providing rice to the community is the different types of rice from farmers as

suppliers due to a lack of understanding of this PUPM program. The TTI sold a mixed variant of rice, which caused some consumers to complain about buying different types of rice at the same price. Hence, standardization of types of rice is an important thing to be done in the future. Since anyone can buy the rice sold by TTI with a maximum of 100 kg per household, the TTI should reach a wider area (Sekayam sub-district) by establishing more TTI centers and devising a set of criteria for consumers. If, for some reason, the number of TTIs cannot be implemented, the TTI rice should only be sold to particular consumers, namely poor households and orphan foundations. Through this policy, the TTI will have multiple impacts; shortening the supply chain, contributing to local food security, and overcoming poverty.

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Conflicts of Interest: The authors at this moment declare that there are no conflicts of interest.

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