The Implementation of Program “*Desa Mandiri Benih*” (Self-Sufficient Seed Villages) for Promoting Farmers Welfare (Study in Mempawah Regency, West Kalimantan, Indonesia)

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ABSTRACT

This study discussed the implementation of Self-sufficient seeds village program in Mempawah Regency, West Kalimantan as an effort of the Government to develops seeds independency in villages and able to provide quality seeds. The study conducted using descriptive qualitative approach using the program implementation theory by David C. Korten (1980). Respondents were composed of participant and non-participants farmers of the Self-sufficient seed villages program. The results showed that in terms of three elements of program content and context of Implementation on supports the program implementation were running well. It is important to observe the sustainability of this program at the end of it farmers would then be able to produce high quality seeds continuously with or without government programs.

Keywords: *self-sufficient seeds village program, farmer welfare, West Kalimantan*

INTISARI

Penelitian ini membahas tentang Implementasi Program Desa Mandiri Benih di Kabupaten Mempawah, Kalimantan Barat sebagai salah satu usaha Pemerintah Pusat untuk mengembangkan kemandirian benih di desa, dan desa mampu menyediakan benih berkualitas sendiri. Penelitian menggunakan desain kualitatif deskriptif dengan teori implementasi program David C. Korten (1980). Responden terdiri dari peserta program dan non program Desa Mandiri Benih. Hasil penelitian menunjukkan tiga elemen implementasi berjalan dengan baik. Sangat penting untuk meneliti kelanjutan program ini pada saat program berakhir, apakah para petani terus memproduksi benih bermutu dan bersertifikat dengan atau tanpa bantuan Pemerintah.

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1. Introduction

Rice (*Oryza sativa*) is the primary food source for more than one-half of the world's population. As a major global crop, rice has been cultivated in Indonesia for a long time and rice farming is the major livelihood of most Indonesian people. According to 2015 data by

Statistics Indonesia (BPS/ Badan Pusat Statistik, the Central Bureau of Statistics), rice production in 2015 is 75,361.3 t/ha, and increase of about 10% from 2011 figures, which was 65,756.9 t/ha.

The five largest rice-producing countries in Asia are China, India, Indonesia, Bangladesh, and Vietnam (FAO, 2014). Although Indonesia is the third largest

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country in terms of global rice production, Indonesia still has to import rice almost every year. One reason for this is to maintain food reserves at safe levels. This situation caused by the large population of the country and farmers who use non-optimal production techniques in combination with large per-capita rice consumption.

Rice production in Indonesia is dominated by smallholder farmers, not by big private or state-owned enterprises. Smallholder farmers account for around 90% of Indonesia's rice production, each farmer holding an average land area of less than 0.8 hectares.

Figure 1 Rice Production in Indonesia 1993 – 2015
Source: Statistics Indonesia, 2015

The data shows the development of rice production in Indonesia from 1993 to 2015. In 1993, Indonesia's rice production was only 48.13 million tons. By 2015, rice production had reached 74.0 million tons. The national average rice growth during the period was 2.08% per year. Paddy production in Indonesia is mostly from Java Island. In 1993, rice production in Java reached 28.30 million tons, while it was 19.83 million tons outside Java. In 2015, the production of rice in Java grew to 38.38 million tons, and 36.61 million tons outside (Statistics Indonesia, 2015).

Farmers in Indonesia face three basic problems in agricultural development (Ministry of Agriculture, 2010:1). The first is the lack of access to financial sources. Most farmers face capital constraints, both equity capital and access to capital institutions. Second, the lack of access to market. The long chain in the agricultural trade system prevents farmers from obtaining better prices. Third, is the lack of access to technology. Some Indonesian farmers are still cultivating using traditional methods, while only a small number use advanced technology.

Considering that Indonesia's population consumes large quantities of rice and the risks of importing rice when food prices rise, Indonesia places top priority on achieving self-sufficiency in rice production.

Indonesia has been striving for self-sufficiency for many decades, yet only succeeded in the mid-1980s, and then, from 2008 to 2009. In recent years, Indonesia has had to import rice annually, mainly from Thailand and Vietnam under the National Logistics Agency

(BULOG). Indonesia aspires to become a self-sufficient country in rice production by 2020. Furthermore, the government allocated more state funds to build agriculture infrastructure, rehabilitation of water management infrastructure, and the distribution of seeds, fertilizers, and agricultural machinery.

2. Theory

2.1 David Korten's Program Implementation Model

Korten (cited in Tarigan, 2000:19) makes the Fit Requirement Model of a policy or program implementation using a learning process approach. This model is consistent with the three elements that exist in the implementation of the program, the program itself, the implementation of the program and the target group of the program.

David Korten (1980) stated that a program will successfully implemented if there is a suitability of the three elements of program implementation.

Figure 2 Schematic Representation of Fit Requirement
Source: David C. Korten, 1980

The three element of program implementation are:
a) The suitability of the program with the beneficiaries, it means the suitability between what is offered by the program and what is needed by the target group; b) The suitability between the program and the implementing organization, which is the suitability between the tasks required by the program and the capability of the implementing organization; and c) The suitability between the beneficiary group and the implementing organization, which the suitability between the terms decided by the organization to obtain the output of the program with what the program target group can do. Correlation between implementation subject, environment, and public policy according to Dunn (2003) also depict triangle correlation as well as Korten's opinion with politic culture and socio economic influence.

Choosing David C. Korten policy implementation process approach based on government program policy,

to analyze and evaluate how the program implementation running. The fit requirement model of the policy or program implementation is also relevant as criteria for measuring policy implementation. In other words, the effectiveness of policies or programs according to Korten depends on the degree of conformity between the program and the user, the suitability of the program with the implementing organization and the suitability of the beneficiary program with the implementing organization.

2.2 Seeds Self-Sufficiency Program

Recently, food security has become the primary global problem. Over 850 million people in the world are undernourished (Carney et al, 1999). Therefore, it is important to ensure that the new approaches to food security improve agricultural productivity and increase access to food for the poor.

In Indonesia, food security was mentioned in Regulation No.18 Year 2012 under the main article on "Food." It is defined as the fulfillment of the conditions of adequate food, both in quantity and quality, safe, equitable, and affordable.

To achieve national food security and fulfill consumption demand, it is necessary to encourage farmers to use quality seeds and increase the production of food crops. Based on empirical evidence, improved productivity and crop quality are strongly influenced by the quality of seeds used by farmers. Self-sufficient Seed Villages (SSSV/ *Desa Mandiri Benih*) program is one of the programs supporting the achievement of production targets, to solve the problem of availability of quality seeds. The program will develop a group of breeders or a combination of breeder groups that can meet the demand for seeds in their respective regions, to establish cooperation between farmers and the government for the success of this program, and to improve the welfare of farmers.

3. Research Method

Drawing with descriptive qualitative approach, focus of research were analyze the implementation of Self-sufficiency seeds Villages program and how the program supporting farmer welfare in Mempawah Regency.

The survey was conducted with 31 farmers in Mempawah Regency, spread over four sub-districts, namely, Sungai Kunyit, Toho, Anjongan, Jungkat, and Wajok Hulu. Sungai Kunyit and Toho sub-districts were chosen because some of their villages have been participants in the Self-sufficient Seeds Village Program, namely, Kecurit, Toho, Sambora, and Sungai KunyitLaut villages. Meanwhile, Anjongan, Wajok Hulu, and Jungkat Sub-districts were non-participants in the Self-sufficient Seeds Village Program. Using the

qualitative method, the study involved observation and in-depth interviews tounderstand the obstacles that the farmers face in producing quality seeds and why some farmers are still using local varieties instead of high-quality seeds.

Summarize of interviewed farmer's characteristic depict in the following table:

Table 1 Farmer's Characteristics

Farmer's Characteristics	Total
<i>Jobs</i>	
Rice cultivation as a main job	28
Rice cultivation as a side job	3
<i>Family members</i>	
4 person or less	13
more than 4 persons	18
<i>Land ownership</i>	
More than 1000 m2	29
No land	2
<i>Age</i>	
20 - 29 years	1
30 - 50 years	19
51 - 65 years	8
> 66 years	3
<i>Farming experience</i>	
11 years or more	24
10 years or less	7
<i>Educational background</i>	
High school or higher	10
Junior High School	4
Elementary school or lower	17
<i>Rice Scale</i>	
Large	16
Medium	10
Small	5

Source: Analytical result, 2018

More than 80% of the respondents consider farming as their main job. Most of them cultivate for self-consumption; therefore, 50% still use superior seeds and local varieties. Different responses come from 3 farmers, stating that farming is only their side job. 2 farmers have their own businesses while one farmer is a carpenter.

18 farmers have more than 4 household members, and 13 farmers have 4 household members or less. Family members could affect farmers' activities, as they will have to work harder to provide food for everyone.

We divided the respondent into three categories. Category 1 (one) are 9 farmers who produce quality seeds but not participants in the self-sufficient seeds village program. Category 2 (two) are 16 farmers who produce rice for consumption and were not participants of the self-sufficient seeds village, and Category 3 (three) were 6 farmers who produce quality seeds and

participated in the Self-Sufficient Seeds Villages program.

Out of 31 farmers, 15 cultivate quality seeds, and 16 are still conventional farmers, who cultivate to either consume or sell to retailers. This indicates that smallholder farmers become motivated for large-scale expansion.

All informants are categorized as productive farmers (22 - >69 years old). Mostly, they began to cultivate or became farmers by helping their parents from a young age. Therefore, most inherit their rice fields and learn to farm from their parents. The ability of farmers depended on their range of cultivation and experience. The interview data shows their cultivation experience from 5 to 35 years.

More than 55% of farmers had completed elementary school or lower and some had passed junior high school; 10 farmers graduated from senior high school and 2 graduated from vocational school engineering. The level of education determines a farmer's ability to learn and understand new technology, as farmers with educational levels lower than junior high school could understand new technology due to their experience in cultivation.

Therefore, we see that farmer characteristic influences farmer ability, which in turn affects yield production.

Some farmer rent their paddy fields to landlords. The scheme of rental price is that the land user pays the landlord either in money or rice. 51.6% of respondent are large farmers, 35.5% are middle farmers, and 12.9% are small farmers. The small farmers do not own land. This study divides farmers into three groups: (a) local breeders who produce quality seeds; (b) producing rice for consumption; and (c) producing both quality seeds and rice for consumption.

To obtain accurate information for research, we also interviewed the Head of Division and Head of Section in Mempawah Agriculture Office, Field Assistants, Seeds Supervisor (PBT), Pest Organism Controller (POPT), and Agriculture Instructor (PPL). We inquired about their duties and functions in the Self-sufficient Seed Villages Program, number of meetings held in a fiscal year, system for scheduling meetings with farmers. We also interviewed the chiefs of farmer groups and the farmers themselves to inquire about the services provided by the extension officer, the perceived benefits of this program, feedback, and expectations from the program.

4. Results and Discussion

4.1 Self-Sufficient Seeds Villages Program

The Self-sufficient Seed Villages program started in Fiscal Year 2015 with nearly a thousand units or

villages spread across 31 provinces or 356 regencies/ municipalities. This program only focused on increasing production of rice, maize, and soybeans. In Fiscal Year 2016, for sustainability and growth, the local governments allocated activities to strengthen the Self-Sufficient Seed Villages Program.

One unit of this program is of 10 hectares, and the local governments give social assistance of IDR 170 million per unit. The expected costs include materials for production, cost of seed certification, procurement of equipment and machinery for seed processing and packaging, warehouse development, and construction of drying floors. In addition to self-preparation of seeds, the local governments are also building institutions for independent seed breeders and for better production capacity.

The purposes of Self-Sufficient Seeds Villages (Desa Mandiri Benih) program are as follows: it enables the farmer group, breeder group, or a joint of group farmers with group breeders to increase their seed production capacity to meet the demand in their areas.

This program involves farmer groups, local breeder groups, the provincial Agriculture office, the regency Agriculture office, seed supervisors, and seeds office unit as aides. With a wide area of activity of 10 hectares per villages, farmer groups or local breeder groups, and affiliation between farmer groups and local breeders receive seed source assistance and complementary warehouse facilities. To enhance the capacity building of farmers, the program provides classroom training or in the field. The Agriculture offices, both provincial and regency, are responsible for the monitoring and evaluation of the program.

Table 2 West Kalimantan Rice Production

Paddy	Production (Ton)						
Year	2010	2011	2012	2013	2014	2015	2016
Rice Field	1,159,012	1,197,493	1,094,859	1,246,384	1,197,984	1,120,426	1,166,391
Upland Rice	184,876	175,497	205,241	195,492	174,710	155,281	198,133
Paddy Total	1,343,888	1,372,989	1,300,100	1,441,876	1,372,695	1,275,707	1,364,524

Source: Agriculture Provincial Office (Crops Section), 2017

The table shows the production of rice in West Kalimantan. We divide it into rice field/ paddy and upland rice. The yield productions and productivity of rice field paddy are higher than that of upland rice. Most upland rice used are local varieties that farmers have had for years, planting it in dry fields or converted forest land. Upland rice depends on water from rainfall; therefore, there is more harvest failure than rice fields, which have irrigation systems. Farmers who planted local rice/ upland rice were the target of Extension

officer (PPL) and Seeds Supervisors (PBT) to change over their local varieties with new varieties.

4.2 Implementation of Self-sufficiency Seeds Villages Program

Thus far, the implementation of the Self-sufficient seed village (SSSV) program is as per the goals and objectives of the program. The SSSV program that had been implemented has succeeded 50% and is in line with goals and objectives. Candidates of farmers/prospective land (CPCL) as the recipient SSSV program was determined by the Regency Agriculture Office and approved by the Agriculture Provincial office. The SSSV program is useful for farmers, motivating farmer towards business-oriented farming; however, it is important to maintain the sustainability of this business after the program ends. It means that even without help, farmers continue to work independently.

Table 3 Breakdown of High Quality Seeds Production (Gross Values)

Farmer Groups Participating in the Program	2011	2012	2013	2014	2015	2016	2017
FG 1: Bernas	17.5	35	1.07	1.25	21	31	55.3
FG 2: Benuang Agritama	40.5	121.1	49.9	66.95	102	103.7	50.5
FG 3: Sidomakmur VII	0	0	3	1.5	39	109	121.3
FG 4: Usaha Bersama	0	0	22	7.7	17	30.2	107.05
FG 5: Gapoktan Kelapa 4	0	0	3.5	0	16	0	0
TOTAL (Ton/Ha)	58	156.1	79.5	77.4	195	273.9	334.2

Source: Agriculture Provincial Office (Crops Section), 2018

The production table describes the progress of high quality seeds (new varieties seeds) produced by farmer groups from 2011 to 2017. This is the gross seed production without separating the total seed production from the SSSV program and another programs such as providing high quality seeds from UPBS.

FG3, FG4, and F5 in 2011 and 2012 produced rice and potential seeds. Their potential seeds belong to other farmer groups possessing competence certificates as seed producers. In 2013, they began producing high quality seeds after receiving the competence certificate from UPSBT PH West Kalimantan Province. They could then label seeds with the name of their farmer group.

In 2015, the fifth joint farmer group was appointed as a participant of the SSSV program. As mentioned, they produce high quality seeds to fulfill seed requirements in their villages, and can market surplus stocks to other villages or regencies.

The social assistance to complete the production facilities has been distributed 100% to the program participants and used by the farmer groups to purchase the necessary tools and means of production such as sacks, plastic packaging, power thresher, tarpaulin, seed cleaner, paddy mower sealer, scales and moisture testers.

Agricultural programs aim to help farmers become self-sufficient and to continue producing quality seeds, even if they do not get government assistance. Often, farmers belonging to farmer groups participate in another government program after one program is over. Some of them do not continue to plant and buy superior seeds when the rice-planting season arrives, but they use seeds derived from superior seeds.

This survey shows that farmers are already using superior quality seeds, particularly large-scale and middle-scale farmers; however, many are still using local rice seeds and Inbrida seeds that they have already planted more than two times. Inbrida seeds, which are planted over one season, have lost their excellent figures (seeds had experience segregation).

Farmers still use local seeds or Inbrida rice derivatives because they consider the seeds to be of good quality, despite it being planted many times. Farmers cultivating rice for self-consumption and not affiliated with farmer groups would want to try planting high quality seeds, if they receive assistance from the government or the Department of Agriculture. Conventional farmers obtain the seeds and exchange them with local seeds of other farmers. The seeds exchanged are from the harvest of the previous growing season, instead of new seeds purchased from seed producers.

Not all subsistence farmers want to change local rice seeds to superior quality seeds, although they want to ensure high productivity. Their awareness of replacing local seeds by superior quality ones is still low; therefore, they need to socialize continuously, and the Seeds Supervisor (PBT) and Field Extension Officer (PPL) should give them some samples.

4.2.1 The Suitability Between The DMB (Desa Mandiri Benih/ Self-Sufficient Seed Village) Program and Government

In implementing of DMB (Desa Mandiri Benih/ Self-sufficient seeds village) program to support the welfare of farmers in Mempawah regency, the human resources aspect becomes the main point of attention in achieving the objective of this program. Stated by the head of the field of food crops and horticulture that in the implementation of the program had direct assistance of seeds supervisor (PBT), field officers such as agricultural field extension, plant seed supervisors (PPL) and Pest Organism Controller (POPT) became very

important in conducting guidance and assistance for farmers for the implementation of this program. Agriculture officer has been socialized the program to the farmers groups. Furthermore, Head of the Regency/ Municipal Agriculture Office proposes prospective farmer group, seed breeder group or combined farmer groups with seeds breeder groups who received the PROGRAM to the Head Provincial Agriculture Office. Head of Provincial Agriculture Office assigns UPTD BPSBTPH (Seeds supervisor and certification officer) to perform technical verification of nominee proposed by Head of Agriculture Service District/ . Farmer groups who were appointed as the implementer of the program approved by the Head of the Provincial Agriculture Office. The Directorate General of Food Crops using the proposal of farmer groups has appointed for the program from the Agriculture Province office.

4.2.2 The Suitability Between The Tasks Required By The Program and The Capability Of The Government Officials

An implemented policy or program can be ineffective if its implementation organization does not have good characteristics. The characteristics of the implementing agency, show how an organization has the color or characteristics of agencies that can influence how the organization can work effectively. Based on information from informants (Head of Office) that the division of work of employees in carrying out the activities of the program has been described in general guidelines and technical guidance of program issued by the Ministry of Agriculture. At the Central level to the district level there have been a clear job descriptions and serves according to guideline.

Field officers such as PBT, POPT, and PPL perform their duties in accordance with their duties, subjects and functions as agricultural officers. Although in field, their duties as escort officers can also serve as farmers' consultants in making decisions about future cultivation plans, even to other problems, such as farms, plantations, and fisheries. Therefore, the experienced field officers and broadminded are needed.

All of appointed officer work together in SSSV (DMB) Program, and Regency Agricultural Office as the supervisor and coaching in line with field officer job description. In term of capability, field officer escort had a knowledge corresponding with their job. There is no particular requirement to become the officer in DMB program, yet it would help if the escort officer had experience in marketing management and will help farmers how to promote their seeds.

4.2.3 The Suitability Between The Beneficiary Group and The Implementing Organization

Communication is an important factor in policy implementation. Good communication needed in policy implementation. Particularly communication does exist between the implementers of both implementing policies in one work unit, between work units and even between related agencies. Communication must be well established between the implementer and the public, because the implementation of good policy cannot be separated from the quality of good communication.

Beneficiaries, in this case farmer groups, joined farmer groups, or a joined of farmer groups with local breeders are selected farmers in accordance with the requirements set by the program, which are farmer groups that have the competence as seed breeders. Good coordination and communication in the field between farmers and officials of the Department of Agriculture will support the success of farmers in the implementation of this program. Condition in field, in line with Durlak et al (2008) where organizational functioning as the aspects of the prevention delivery system and training and technical assistance as the prevention supports system therefore the implementation process also affected by variables related to communities, providers and innovations.

4.3 Factors Constraining Implementation of The Program

4.3.1 Capital

Capital is a major constraint in farming. Farmers can use capital to purchase inputs or hire labor for crop production activities. Credit can be obtained from informal sources with interest, whereas loans with interest must be repaid at the end of the cropping season. Farmers can borrow money from formal sources such as the bank, using either their land or house as collateral.

Every level of farmers – small, medium, and large, had the same experience: the lack of capital, whether it is capital for farming, or to buy seed candidates from farmer group members. Subsistence farmers, the smallholder farmers who only plant rice for self-consumption, exchange seeds with other farmers, and save some of their harvest, as seeds for the next planting season. They do not have extra capital to buy quality seeds because subsistence farmers do not really care whether the seeds they use are certified.

The lack of capital is a classic reason and causes difficulty to farmers in buying seeds. The price of Extension Seed (BR) is Rp 7,500 per kilogram, actually,

it is still affordable, even for subsistence farmers with small capitals. Subsistence farmer keep their preparation cost behind budget with spraying rice fields with herbicides, without tillage, and left rice straws on the rice fields or burned; then, farmers dig holes and plant the seeds.

4.3.2 Lack of Farm Equipment

Farm equipment such as tractors, rotary tillers, cultivators, rice transplanters, and water pumps to improve irrigation channels are the most common agricultural machinery utilized in Indonesian farmland.

Seventy-five percent of the farmers from the research location have been utilizing hand tractors for land tillage. These hand tractors are owned by farmer groups or rented from other farmers, and others are provided through government assistance. Paddy fields with minimum tillage are sprayed with herbicides.

The lack of harvesting equipment is also a classic problem. Farmers need some essential harvesting equipment, such as seed cleaner, tractor, harvesting tools, and so on. Many farmers have to rent the harvesting tools and queue for their turn. The high cost of equipment becomes a constraint for farmers. This is because farmers in Toho Districts and West Kalimantan, in general, are still household-oriented, not business-oriented.

Table 4 Mechanical Harvesting Equipment Ownership

Criteria	Farmers	Remarks
Own assets	11	Hand tractor, Power Thresher, Combine Harvester, Lawn Mower
Farmer groups assets	7	Hand tractor, Power Thresher, Combine Harvester
Leasing equipment	10	Hand tractor, Combine harvester
None	3	
Total	31	

Source: Analytical result, 2018

Generally, farmers with small capital do not have harvesting equipment such as mini farm tractors or hand tractors. Frequently, they rent one from other farmers. Consequently, the tight schedules of rental farm tractors paralyze their planting schedules, leaving the rice seedlings vulnerable to pests and diseases.

Mechanization in agriculture is essentially aimed at improving land and labor efficiency, increasing the area of cultivable land, saving energy and resources (seed, fertilizer, and water), increasing the effectiveness, productivity, and quality of agricultural products, reducing the workload of farmers, maintaining environmental sustainability and sustainable agricultural

production, and increasing farmers' income and welfare (Salokhe and Ramalingam 1998).

4.3.3 Participation of Farmer Groups

One indicator of self-sufficient rice agriculture is less dependence on rice imports. One of the problems faced in the attainment of self-sufficiency of rice is satisfying the specific recommendations of appropriate seed locations.

In addition, farmers encounter some difficulties in growing rice seeds. Therefore, the help of local breeders of rice seeds is necessary. Breeding seeds can ensure the availability of quality seeds or superior varieties of rice suitable to its environment. This is done through the development of community-based seed breeding, where farmers in community groups called *Kelompok Tani* are, are encouraged to produce their own seeds at the expense of the group. Thus, the demand for seeds will be fulfilled in a sustainable manner and further save time and money. It can also be a good source of seed production unit-oriented agribusiness.

Four of 31 farmers interviewed were not included in any farmer groups. They knew about the farmer groups but never asked to join the groups. This is a challenge for Agriculture officers in West Kalimantan, to suggest subsistence farmers to become business-oriented farmers and undertake professional farming.

As a potential resource playing the critical role in delivery and co-ordination of services to smallholder producers, farmer organizations (FOs) provide a means for service providers to reduce the number of small-scale transaction they contracted in with individual farmers (Poulton et al, 2006), Merret and Welzer (2001) cited in James and Joshua (2014) also emphasized that farmers cooperative organizations assisting to develop new ideas, innovations and incentives to promote people positively involve in Agricultural development.

4.3.4 Market Access

At present, the procurement and distribution of rice seed is still dominated by PT. PERTANI and PT. Sang Hyang Seri (SHS), and a local private breeder only produce small quantities of seeds. Formerly, this local private breeder produced good quality unlabeled rice seeds, relatively cheap. This indicates the potential demand for rice seeds. Considering the increasing competition in seed markets and government regulations that require the use of labeled and quality rice seeds, local private breeders complement the seed production facilities with drying floors, warehouses, and testing equipment.

Table 5 Price of Seeds

Seed	Unit	Tariff
Breeder Seed (BS)	Per kilogram	Rp. 35.000
Foundation Seed	Per kilogram	Rp. 12.000

Seed	Unit	Tariff
(BD)		
Stock Seed (BP)	Per kilogram	Rp. 9.000
Extension Seed (BR)	Per kilogram	Rp. 7.500

Source: Analytical result, 2018

As mentioned, the seeds sold by Seed Centre conform to government regulation. PT. PERTANI also purchases seeds from BR farmers (both participants of the Self-sufficient seeds Village program and non-participant based on the reference price above).

Local breeder sets the price of rice seeds referring to the above prices. Prospective seeds sell for Rp. 4,500/ kilogram. Rice sold by farmers in the form of dry grain harvest in the range of Rp. 8,000 - Rp. 9,000 per kilogram. Rice-producing farmers sell their dry grain harvest to the local Rice Collector, which grinds the dry grain into rice. For farmers who have Rice Milling Units, such as Gapoktan Benuang Agritama, dried milled rice sold at Rp. 10,000 per kilogram.

Farmers' welfare is the ultimate goal to be achieved from agricultural development. It is based on the fact that farmers are the main actors in agricultural development, should have earned equal rights with the outpouring time, energy and thoughts that have been devoted to work in fields of agriculture. Various policies, programs and activities implemented in building agriculture is a means or instruments for policy makers in the field of agriculture efforts to improve the welfare of farmers. Farmers' welfare levels are measure from: (a) per capita income; (b) the level of poverty and (c) the level of food insecurity farm households (Statistics Indonesia, 2017).

Irz et al., (2001) found that in rural Ethiopia agricultural productivity has a positive impact on improving the indicators of welfare of rural households. The right design policy interventions not only increasing productivity but also protecting asset of rural households, improving access to nearest towns and markets, reducing inflationary pressures and prudent population.

Challenges faced by small agricultural producers includes capital, infrastructure, and market access, information of food prices on National and International Markets, access to high quality inputs and variable costs of buying seeds and fertilizer; loan facilitation to buy seeds and fertilizer, and lack of transports were commonly found in rural areas (ILO, 2003), therefore, existence of cooperatives and farmer groups could help subsistence farmers growing up as professional farmers.

Ashley and Maxwell (2011) stated investment in public infrastructure like roads and new technology could reduce the transaction costs of small farmers and promote competitiveness.

Existence of government program focused on agriculture development supporting farmers to increase their capability and their farming oriented from consumption to business. Farmers who produce quality seeds earning higher income than subsistence farmer who produce the local rice, however farmer who produce consumption rice will earn high income when they using quality seeds and apply good agricultural practice. Higher income will effect to farmers welfare and push other subsistence farmer to change over local rice to quality seeds.

5. Conclusion

- Farmers in Mempawah Regency, particularly in the research site, experienced some obstacles inproducing high quality seeds, due to lack of capital and a market for their seeds;
- Farmer skill depends on periods of cultivation, and joining farmer groups helps improve skills;
- Farmers require intensive guidance—particularly new farmers—to convince them to use high quality seeds even for rice consumption;
- Market access for high quality seeds still relies on a government program and a National Seeds Distribution Company (PT. PERTANI); and
- It is important to observe if this program is effective after it ends, and if farmers will continue to produce high quality seeds regardless.

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