Technology and local knowledge of farmers in soybean seeds source management in Jambi province

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Abstract. The Ministry of Agriculture has optimism that soybean self-sufficiency can be realized in 2018. Consistency to stay on track that has been targeted has made Soybean Seed Management Unit (UPBS) activities accelerate with the technology of seed multiplication to supply quality seeds. This study examined the dissemination of technology and the existence of local knowledge, especially on consumption farmers to breeders as the output of UPBS activities. The method used is a descriptive qualitative method through literature studies and studies in the social field to explore the potential, roles, constraints and opportunities faced by farmers and soybean seed breeders related to local knowledge. The data collected consists of secondary and primary data. Benefit and Cost Ratio (B/C Ratio) analysis to determine the feasibility of changing consumption farmers to breeder farmers. The results show that farmers' local knowledge changes with technology dissemination. Changes occurred in the use of quality seeds of New Superior Varieties (VUB) with the application of soybean integrated crop management (PTT) models that were able to increase yields 16-27%. Local knowledge maintained in terms of attack control and infestation of plant pests (OPT) in the concept of Integrated Pest Management (IPM). In this case, local knowledge of breeder farmers can compensate for location-specific technology. At the field level, a combination of technology and local knowledge was followed by an increase in income from consumer farmers to B/C soybean growers. The ratio of consumption farmers to 1.45 increased to 1.69 for breeder farmers.

1. Introduction

Indonesian government must import around 1.9 million tons of soybeans each year to meet domestic needs [1]. This high import is a large enough foreign exchange expenditure, so efforts to increase domestic production need to be encouraged and one solution is to look for one with the availability of national seeds.

Seed is one of the production inputs that has a significant contribution to increasing productivity and quality of agricultural products. The availability of seeds with high yielding varieties and high quality, both physical, physiological, genetic and pathological quality is absolutely necessary in an agricultural production system. According to [2, 3] in modern agriculture, seed acts as a delivery mechanism that channels technological excellence to farmers and other consumers. Therefore, a good seed system is needed so that the technological superiority of a variety can be channeled.

Soybean seeds are seeds that quickly experience deterioration or decrease in viability and vigor, especially if stored in conditions that are less than optimal storage. According to [4] the use of low quality seeds with low viability and vigor will result in a low percentage of seedling emergence,
seedlings that are less tolerant of abiotic stress and are more sensitive to disease attacks and will ultimately reduce yield.

Jambi province is one of the centers of soybeans on the island of Sumatra. However, the availability of soybean for public consumption in Jambi Province is still lacking. Until now, Jambi province has not been able to be independent in meeting the needs of seeds and soybean consumption. The cause of the low soybean production due to many farmers still use low quality saved seeds. Farmers continuously grow soybeans without selecting good seeds for cultivating in the next crop. In addition, the availability of seeds by farmers and private business entities and even relevant government agencies often misses when needed. Inadequate cultivation techniques, the attack of disturbing organisms and socio-economic factors are the causes of low soybean seed production.

Jambi Assessment Institute of Agricultural Technology (AIAT), which is the Technical Implementation Unit (TIU) of the Indonesian Agency for Agricultural Research and Development, has been given a mandate to resolve seedling problems in Jambi Province. To that end, Jambi AIAT through the Seed Source Management Unit (SSMU) is contributing in providing quality soybean seeds. SSMU soybean Jambi AIAT activities carried out through seed multiplication in the Integrated Plant Management Field School demonstration plot area and fostering farmer groups and establishing cooperation with Universities and Industrial Plantation Forest (IPF) to utilize the land between IPF plants. The activity aims to produce and distribute FS and SS class soybean seed sources and increase the ability and capacity of breeder farmers in producing soybean source seeds.

In this activity, SSMU also conducted a study on local knowledge of farmers in managing soybean fields and disseminated technology. Farmers' responses to external knowledge and farmers' decision-making processes in adopting innovations are described in this paper. It was also stated that the factors which became an obstacle for farmers in implementing technological innovation in soybean seed multiplication.

2. Materials and Methods
Seed breeding activities were carried out in Dusun Baru Village, District VII Koto, Tebo Regency in January to December 2016, which had been prepared and determined by the local Food Crop Agriculture Office. Preparation for the location of activities included the selection of stretches as needed, carried out with soybean breeder farmer groups.

2.1. Technology and Local Knowledge
Farmer's local knowledge and technology dissemination was inventoried through questions, then presented in the form of a comparison table. The data inventory process were carried out through in-depth interviews with farmers in each assistance that were conducted on their understanding of the cultivation process, IPM, ecological functions and interactions that occurred in it until postharvest. Thus obtained a comprehensive description of the practice of soybean cultivation until postharvest.

There was two categories of farmers as sources of information, namely consumption farmers and soybean breeder farmers. Each of these groups of farmers had different experiences that had implications for land management patterns, so they could show relative differences in their knowledge and experience. Of the two categories above, approximately 30 farmers were interviewed and asked to articulate their knowledge and understanding of the process of managing soybean land.

2.2. Seed production of superior varieties of FS and SS class soybeans
Source seed production was carried out based on technical seed production, namely: 1) Determination of location, 2) determination of source seeds used, 3) land preparation, 4) planting, 5) fertilizing, 6) IPM and weed control, 7) rouging, 8) harvest, 9) drying, 10) seed processing, 11) and packaging. Certification and testing of seeds in the process of seed production is carried out in collaboration with BPSB Jambi Province.

Financial analysis and break-even point were carried out to determine the feasibility of seed multiplication efforts. Seed multiplication was considered feasible if the Gross B/C value was more than 1. The formulation of Gross B/C is [5]:

$$\text{Gross B/C} = \frac{\text{Benefits}}{\text{Costs}}$$
Gross $B/C = \frac{P \times Q}{Bi}$

where:
- $P$ = Production price (Rp/Kg)
- $Q$ = Production result (kg/ha)
- $Bi$ = Production costs to i (Rp/ha)

2.3. Increasing the ability and capacity of breeder farmers in producing soybean seeds

One of the ways to meet the needs of quality soybean seeds was by increasing skills, knowledge, and the capacity of local seed breeders. Provision of seeds through local seed breeders was expected to be able to accelerate the dissemination and distribution of new superior varieties and quality seeds. Improvement of farmers’ skills and knowledge was carried out through cooperation in seed production with cooperative farmers and through training by bringing competent sources in the field of seed.

3. Results and Discussion

3.1. Tillage

In order to obtain quality seeds from farmers’ breeding results, breeder farmers must have knowledge about growing conditions, morphology, propagation technology and analysis of soybean seed farming. The Indonesian Agency for Agricultural Research and Development has issued recommendations for multiplication of soybean seeds. The soybean seed multiplication technology has been disseminated to soybean seed breeder groups.

Agroecology of Dusun Baru Village, District VII of Koto, Tebo Regency is non-acid dry land. Planting Season I is conducted in February - May (MH II) with a soybean cultivation technology package starting from preparing land by tillage till loose before the rainy season, by plowing 1 to 2 times then rake 1 time and leveled. The large seed variety, Anjasmoro, is the preference of farmers in Tebo, while the Wils and Grobogan seed varieties are also planted. The total seed requirement is 40 kg / ha. Seed treatment with rhizobium source biological fertilizer at a dose of 20 g rhizobium / kg seed. Spacing of 40 x 15 cm with two seeds per planting hole. Fertilizer recommendations depend on conditions and soil fertility based on soil analysis, but in general in Dusun Baru Village the application of organic fertilizer or manure is recommended as much as 2 tons / hectare. Plant Pest Organisms (OPT) are controlled based on routine monitoring by farmers accompanied by researchers from BPTP Jambi. To overcome weeds as well as pests and plant diseases carried out based on the technical guidelines for Integrated Pest Management (IPM). Plants are ready to be harvested when the leaves have decayed and 95% of the pods are yellow-brown. Furthermore soybean seeding can be done manually.

Local knowledge refers to community-based agricultural technology and knowledge systems, in contrast to top-down knowledge and technology systems developed by modern research institutes. Because it is community based, in the process of disseminating technology, a suitable method is bottom-up. One way is to ask farmers to talk about traditional processes that are carried out. For example in fertilization, farmers are asked to explain the process of fertilization, the effects of fertilization. When the farmer explains the known stages, the researcher disseminates the technology. In this way farmers do not feel uprooted from the roots of their knowledge.

The farming system used by the community or traditional farmers is an agricultural system based on years of observation of the community’s environment and the surrounding natural environment. Traditional societies have a variety of life-sustaining knowledge including farming knowledge of each type of plant. Based on observations, each type of plant has a variety of uses, so that in each variety there are various kinds of knowledge. The loss of one type of plant variety also means the loss of knowledge that follows it. In one variety contained knowledge about: cropping patterns, tillage, pest control, planting time, and others [6].

Farmers in Dusun Baru Village, District VII Koto, Tebo Regency have local knowledge that provides a specific method of hereditary cultivation. However, farmers who are members of the Harapan Mulya
Farmers Group are willing to accept outside influences selectively so that local knowledge can be maintained in accordance with the place. Their local knowledge is the result of thought based on good experience and has been passed on continuously, and now it is a local knowledge of the community that is sought again to be applied sustainably, because it has proven good results. Thus, in the process of dissemination of soybean seed culture cultivation technology packages there are parts that are changed and parts that are still maintained. The summary of the interview results illustrates the dissemination of technology and local knowledge of KT farmers. Mulya's expectations are as follows (Table 1).

**Table 1. Technology Dissemination of Local Farmers KT. Harapan Mulya Dusun Baru Village, District VII Koto, Tebo Regency, Jambi Province, 2016.**

| Agriculture Sector | Technologya | Local Knowledge | Location Specific Technology |
|--------------------|-------------|-----------------|----------------------------|
| Tillage            | The soil is processed until loose | The use of mulch straw and organic fertilizer | The soil is cultivated so that it reaches loose structures. After tugal, the seed is put into a hole, then the hole is sprinkled with organic fertilizer and covered with straw |
| Use of quality seeds | Anjasmooro, Baluran, Argopuro, Gumiitir, Detam 1, Detam 2, Detam 3, Detam 4, Wilis, Kaba, Sinabung, Arjasari, Malika, Gema, Dering, Argomulyo, Burangrang, Malabar, Ijen, Gema, Dering | Preference for varieties with large and medium seeds, using seeds from the harvest | Anjasmooro, Grobogan Wilis |
| Seed Treatment     | Rhizobium inoculation of seeds before planting, administration of growth regulators (PGR), and liquid supplementary fertilizers (PPC) | Using soil that has been planted with soybeans | Using artificial inoculation, for example: Legin, Rhizogin, and Rhizobin in the form of powder. Mixing is carried out evenly and in a shady place, and the seeds are planted immediately (no more than 6 hours). |
| Fertilization      | Fertilizer recommendations include the main macro nutrients NPK, micro nutrients and manure as well as the use of straw according to the fertilizer reference | The main macro fertilizer of NPK, manure, use of straw | Recommendations for NPK main macro nutrients, micro nutrients, manure, straw according to fertilizer reference. |
Agriculture Sector | Technology④ | Local Knowledge | Location Specific Technology
---|---|---|---
Planting Distance Management | Adjusting plant population, 350,000 / hectare, spacing of 40 cm x 15 cm | Approximately when flowing, however, the spacing of related uniforms is more or less 40 cm x 15 cm | On land with enough water 40 cm x 15 cm On land with limited water 40 cm x 10 cm

④Balitkabi, 2015

In controlling pests in soybean cropping, farmers are still relying on pesticides. Nevertheless efforts to control pests by natural means are also carried out. For example, by setting traps in the form of cloth that has been soaked in an insecticide mixed with shrimp paste. The smell of shrimp paste attracts insect pests to perch on the fabric then the insects prick and suck the liquid that is in the fabric, and not how long the pest dies.

Important pests found at soybean cultivation sites are *Ophiomyia phaseoli*, known locally as bean flies, *Spodoptera litura* or grayak caterpillars, *Nezara viridula* or pale green ladybugs, *Riptortus linearis* or brown ladybugs and other pod borer pests. Currently the recommended technology for effective soybean pest control is the Sidamethrin insecticide for bean flies, Matador for leaf pests, and Deltamethrin for pod sucking pests, SINPV-JTM 97C for controlling grayworm caterpillars and using entomopathogenic *Verticillum lecanii* for *R. linearis*. Alternative control using plant-based insecticide extracts of neem seed powder to control bean flies has not been done. Insects which are natural enemies of soybean pests are also commonly found such as *Harmonia conformis*, *Oxyopes macilentus*, *Chrysopogon sp.* and *Ischnura aurora*. So that this becomes an important note for the sustainability of soybean cultivation to be able to take pest control measures in a wise manner so that natural enemy populations are high and sufficient to play a role in suppressing pest populations.

3.2. Soybean Seed Production

The implementation of the activity involves two farmer groups, which are responsible for carrying out work starting on land preparation, planting, maintenance, harvesting and post-harvesting in accordance with the technology applied. Choosing an appropriate location is the first step that determines the success of soybean breeding activities. So that the risk of failure can be avoided or minimized, the location is directed at conditions suitable for soybean crop cultivation.

3.2.1. Seed Source Soy Classes FS.

Soybean SSMU used Anjasmoro varieties covering an area of 4 hectares, Wils covering an area of 2 hectares and Grobogan covering an area of 1 hectare, carried out by 12 breeder farmers.

Soybean seed source used comes from Malang Balitkabi is a superior variety that has characteristics as: preferred by local farmers, can adapt to the environment, especially with acidity and aluminum levels that are not too high, its taste is liked and has a high price in the market local, high yield, tolerant of pests / diseases, and resistant to lodging. Variety choices are adjusted to the local location, and for the location of these activities the Anjasmoro, Wils and Grobogan Superior Varieties are used.

The average range for growing soybeans is around 90%, the high percentage of growth is due to the high dormancy period and the level of nutrient availability in the soil. Growth of plants in the initial stage (age 14 days) until the time of growth, plants from the flowering period until the filling of the pods looks very good. The performance of soybean cultivation managed by recommended cultivation techniques is far better than the growth of soybean farmers, even though it has been fertilized with Urea, SP-36, and sometimes accompanied by KCl in the same dosage as recommended. The use of good quality seeds, as well as the addition of manure and dolomite are the main causes of differences in plant growth performance (Table 1).
Table 2. Appearance of FS class soybean breeding in Dusun Baru Village, District VII Koto, Tebo Regency, Jambi Province, 2016.

| Blok | Variety | Land area (ha) | Date      | Plant Height (cm) | Age of Flower (hr) | Number of Branches (piece) |
|------|---------|----------------|-----------|-------------------|-------------------|---------------------------|
| I    | Anjasmoro | 1.0            | 10-4-2016 | 80,2              | 32                | 5                         |
| II   | Grobogan  | 1.0            | 10-4-2016 | 80,4              | 33                | 4                         |
| III  | Wilis     | 0.5            | 24-4-2016 | 86,1              | 34                | 4                         |

Appearance of soybean plants in Anjasmoro, Wilis and Grobogan varieties when the plants are 30-50 HST shows good and good growth, with an attractive appearance, straight and clear lines and lines of plants. Appearance of plants against pest caterpillars is still below economic ambag/still relatively low (> 15%), so farmers are sufficiently guided by mechanical control, if the attack exceeds the threshold then control will be carried out using insecticides, so it does not affect the pod filling period.

Observation of the age of flowering Anjasmoro varieties seen flowering plants with an age range of 32-35 HST, Wilis variety aged 35-36 HST and Grobogan Variety 28-29 HST. The occurrence of time that is too long for flowering out between Anjasmoro, Wilis and Grobogan varieties is caused by genetic traits of each variety.

The average height of Anjasmoro varieties ranged from 80.3 - 89.0 cm, Wilis varieties ranged from 79.3 - 81.4 cm, while Grobongan varieties ranged from 65.9 - 67.2 cm. It was seen that by fertilizing P and management of organic matter can increase the growth and productivity of soybean plants in a sustainable manner. Most of the soils in the tropics need a large amount of P needed by soybean plants is relatively small compared to the needs of the elements N, K and Ca, but some P research results show an increase in soybean yield. Besides lime will increase the need for plants for macro and micro elements. Therefore fertilizing N, P and K is needed. Application of technology in accordance with the recommendations will provide maximum results to the purity of soybean seeds.

Maintenance of the genetic quality of the varieties is carried out by means of rouging when the plants are aged 15-20 HST, the phases and cooking phases of physiology, namely removing plants whose morphological characteristics deviate from the characteristics of the varieties of plants whose seeds are produced. At the age of 15-20 HST the observed component is hypocotyl color, green hypocotyl will produce white flowers, while purple hypocotyl will produce purple flowers. In the flowering phase, flowers that are too deviant from the dominant plant then the plant is immediately discarded. Likewise in the physiological cooking phase, plants that deviate from the dominant plant are immediately uprooted.

All these activities are carried out by breeders with the guidance of Jambi AIAT researchers, field agricultural extension workers, and Agricultural Seed Supervision and Certification Center staff in the regions. Thus purity and later no longer have problems regarding labeling because from the beginning it was monitored by Agricultural Seed Supervision and Certification Center staff in the field.

The performance of the FS seed production shows that the Anjasmoro variety before the laboratory test was 6,300 kg, passed the test (certified seed) of 6.00 kg. Grobogan varieties as much as 800 production, the laboratory test did not pass, this is due to the quality of grobogan varieties are not suitable for planting in this location. The Wilis variety produces 500 kg of seeded seeds whereas the production of 1600 kg, the low percentage of passing the wilis variety certification is also influenced by the growing environment at the location of seed multiplication as presented in Table 3.

Table 3. Production of soybean seeds from BS to FS class, in Dusun Baru Village, District VII Koto, Tebo Regency, Jambi Province, 2016.

| Variety | Blok | Land Area (ha) | Production (ton) | % Pass Test | Pass |
|---------|------|----------------|------------------|-------------|------|

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The results of multiplication of BS-FS seeds with a target of 7 tons can only be reached as much as 5,500 kg, this is caused by constraints of environmental factors growing plants. The results of this FS propagation will be continued in the next season to get SS seeds.

3.2.2. Seed Source SS Soybean.
Propagation of FS-SS soybean seeds using Anjasmoro varieties covering an area of 15 hectares carried out by 22 breeder farmers. Activities are located at KT. Harapan Mulya, Dusun Baru Village District VII Koto, Tebo Regency. The implementation of the activity involved two farmer groups, who were responsible for carrying out work starting on land preparation, planting, maintenance, harvesting and post-harvesting in accordance with the technology applied.

Producing high-quality seeds, improving physical, physiological and genetic quality, is also carried out during post-harvest handling. Maintaining physical and genetic quality is mainly carried out during processing, while maintaining physiological quality of seeds is carried out from harvest to storage and even until the seeds are ready for planting by farmers.

The performance of soybean plants at the age of 30-45 days shows a fairly rapid growth and good, attractive appearance with a straight and clear plant flow. Appearance of plants also appears to have a caterpillar attack but still relatively low or below the economic threshold (> 15%), so farmers are sufficiently guided by mechanical control, if the attack exceeds the threshold then control is carried out using insecticides, so it does not affect the pod filling period (Table 4).

| Table 4. Appearance of conditions for multiplication of FS to SS soybean seeds with Anjasmoro varieties in Dusun Baru Village, District VII Koto, Tebo Regency, Jambi Province, 2016. |
|-------------------|------------------|----------------|-----------------|----------------|
| Blok | Land Area (ha) | Date | Plant Height (cm) | Age of Flower (hr) | Number of Branches (piece) |
| IV | 0,5 | 5-4-2016 | 95,2 | 31 | 5 |
| V | 1,0 | 6-4-2016 | 92,4 | 33 | 5 |
| VI | 0,5 | 7-4-2016 | 87,1 | 32 | 4 |
| VII | 0,5 | 8-4-2016 | 89,0 | 34 | 5 |

Furthermore, observations of flowering age showed that Anjasmoro varieties issued flowers at the age of 31 - 36 HST. The average plant height at 40 HST ranged from 87.3 to 99.9 cm (Table 2). It can be seen that the timely application of fertilizer and dosage is very influential on plant height. The purpose of fertilizing is to improve physical and chemical conditions in the soil. P fertilization and organic material management can increase productivity on an ongoing basis. Most of the soils in the tropics need a large amount of P needed by soybean plants is relatively small compared to the needs of the elements N, K and Ca, but some P research results show an increase in soybean yield [8].

Field performance of plants shows the growth and development of plants is very encouraging and is predicted to be able to produce seeds around 1.3 - 1.8 tons / ha of SS seeds. The multiplication of Anjasmoro variety seeds to get the SS seed class can be seen from the planting block which has quite encouraging production, with the percentage of certification passing ranging from 92 - 95% (Table 5).
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| Table 5. Production of soybean varieties anjasmoso seeds from FS to SS seed classes, in Dusun Baru Village, District VII Koto, Tebo Regency, Jambi Province, 2016. |
|-----|-----|-----|-----|
| Blok | Land Area (ha) | Production (ton) | % Pass |
|     |     |       |       |
|     |     | Test  | Pass  |
| IV  | 5.0 | 6.500 | 6.000 | 92.30|
| V   | 5.0 | 7.400 | 7.000 | 94.60|
| VI  | 5.0 | 5.500 | 5.000 | 90.20|
| VII | 5.0 | 5.300 | 5.000 | 94.34|

3.2.3. Feasibility Analysis. The profit of soybean seed farming is more profitable than consumption of soybean farming. The high profitability of seed production farming compared to consumption production is caused by differences in selling prices. The selling price of soybean seeds is Rp 12,000 per kg, while the selling price of soybean consumption is only Rp 6000 to Rp 7,000 per kg or there is a difference in the selling price of Rp 5,000 to Rp 6,000 per kg.

Revenue from consumption farming is IDR 10,850,000 / ha / planting season or IDR 2,712,500 per month. Whereas, from the production of seeds, Rp 17,700,000 / ha / planting season or Rp 4,425,000 per month. The revenue from seed production farming is sourced from sales in the form of seeds amounting to Rp. 15,900,000 and in the form of consumption as much as Rp. 1,800,000. seed so it is sold in the form of consumption. Therefore, the profit gained from consumption farming is IDR 6,427,500 / ha / planting season, whereas in seed farming farming, it gives profit of IDR 11,113,500 / ha / planting season. B / C consumes 1.45 while B / C seeds 1.69.

In both of these farms, wages represent farm expenditures that are greater than those spent on material purchases. In farming, the consumption cost that must be spent for wages is 73.04%, while the costs for purchasing materials for production facilities are only 26.96%. Similarly, seed production farming, where the costs incurred for wages amounted to 63.87%, while the costs incurred for the purchase of production facilities amounted to 36.13%. The amount of wages incurred on existing farms compared to introductory technology farms is due to the low efficiency of farms on existing technology, especially on the expense of nursery costs that have moved twice.

3.3. Increasing the ability and capacity of breeder farmers in producing soybean seeds

With the implementation of site-specific technology that accommodates technology as a result of research combined with local knowledge, it is no wonder that at the farmer level there are still doubts about its success. So that the presence of the Jambi SSMU plays an important role so that farmers do not feel alone. SSMU becomes a supporting system if farmers experience failure.

The proper implementation of the activities so far with the pilot project is to make a pilot designed as a test or trial in order to demonstrate the effectiveness of a program implementation, find out the impact of program implementation. In other words, the area in the soybean center becomes a laboratory for researchers by sitting together with farmers. Researchers do not position themselves as superior to farmers but as colleagues or learners alike. Its application uses the participatory method, which is a method in which researchers go directly to the field following the activities under study. An example of the convention is by explaining the institutional strengthening of the corporation area through escorting, fostering and assisting in corn seed production techniques, then, provide assistance for production facilities, agricultural machinery, infrastructure, and market access [9].

Some requirements must be met when farmers become seed growers. In the context of strengthening the capacity of human resources (HR), farmers are equipped with technical capabilities of breeding soybean seeds. It is intended that farmers can make soybean seeds independently.
Some requirements, for example, have facilities for seed production, drying floors, processing facilities and warehouses. To facilitate the management of the seed breeder empowerment area, if possible it is placed on one stretch, but if it is not possible it can be implemented not on one stretch but still within 1 (one) subdistrict area. Seed breeders or breeder groups must carry out seed breeding in accordance with the target area of each commodity.

So that the implementation of seed breeder empowerment activities can run according to the provisions, it is necessary to provide guidance, monitoring and evaluation at the central level as well as provinces and districts/cities that are allocated the Seed Breeder Empowerment activities. Assistance is carried out from the beginning to the end of the process so that both farmers and researchers see and experience the implications of all stages of the process.

The sustainability of this program is also very much determined by the process of monitoring and evaluation of the relevant agencies collaborating with the relevant villages. It would be better if the seed multiplication program carried out in the related villages was included in the Village Development Planning. It is even possible to be grafted with a Financial Institution [7].

4. Conclusion

In the process of dissemination of soybean seed multiplication technology cultivation packages there are parts that are changed and parts that are still maintained. The production target of 7 tons of FS soybean seeds achieved was 5.5 tons, while the SS seed class with a target of 15 tons reached 23 tons or exceeded the target of 7 tons of SS seed. Through the guidance and assistance of breeder farmer groups regarding cultivation of seed, harvest, post-harvest technology and improvement of group administration, the supply of seeds from outside the region can be reduced or even eliminated. The capacity and capacity of breeder farmers has increased, this is seen from the success of producing seeds and getting an award as the best breeder group of Jambi Province. Soybean seeds from UPBS BPTP Jambi contributed to the supply of source seeds for the fulfillment of soybean seeds for breeder farmer groups and Provincial and District/City Government programs.

6. References

[1] Jambi Province Food Crop Agriculture Office. 2015. Food Crop Design Activities in 2015. Jambi Food Crop Agriculture Service.

[2] Nugraha US 2004. Legislation, policies and institutions for seedling development. Technological Development PRO. 16 (1): 61-73.

[3] TeKrony DM 2006. Seeds: the delivery system for crop science. Crop Sci. 46: 2263-2269.

[4] Ilyas S 2006. Seed treatment using matricconditioning to improve vegetable seed quality. Bul. Agron. 34 (2): 124-132.

[5] Kadariah 2001. Economic Analysis Project Evaluation. Faculty of Economics Publisher Institute. University of Indonesia. Jakarta.

[6] Kastono D 2017. Application of Local Wisdom-Based Soy Cultivation Culture Culture in Supporting Food Security. Development of a local soybean seed center. https://pekakekal.org/

[7] Seed Supervision and Certification Center 2009. Realization of Certification and Production of Rice, Maize, Soybean and Peanut Seeds. Supervision and Certification of Seeds for Horticultural Crops in Jambi Province.

[8] Yardha, Adie M 2009. Performance of Soybean Hope Strain in Tidal Land. Jurnal Agrista. Faculty of Agriculture, Syiah Kuala University, Banda Aceh. Volume 13, Nomor 1. April 2009.

[9] Yardha, Nugroho H, Adri 2013. Acceleration of adoption of new high-yielding soybean varieties in tidal land. Proceedings of the 2013 National Seminar on the Result of Various Beans and Tuber Food Crops Research.