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Production of Extension Seed Through Local Stakeholders' Contribution: A Case study of Superior Rice Variety (SRV) *Inpari IR Nutri Zinc*

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ABSTRACT
Pregnant mothers are a nutrition-prone group. Lack of energy chronic has impacts on the fetal and toddler growth, one of it is stunting. The prevalence of stunting in rural areas are higher than those in urban. To overcome the stunting, Ministry of Agriculture through Balitbangtan has released *Inpari Nutri Zinc*, a nutritious superior rice variety (SRV). This study aims to design an effective channel of propagating the *Nutri Zinc* seed by collaborate with local stakeholders. The study was done in March 2020 in Bantargebang, Sukabumi. Data was collected through Focus Group Discussion with local stakeholders in District and sub district that contribute with the SRV propagation: the officers, midwife, extension, and farmer group. Result showed that channeling the program with proper stakeholders and target location will establish a successful of the SRV propagation. The collaborated stakeholders were divided from district and sub-district officers. The taskforce in both sites were designed and comprise of a local officer, a village midwife, and an extension. Furthermore, farmers groups managed the propagation and assisted by an extension, where the yield produced will use to support stunting and to provide seed for next farming season.

Keywords: *Inpari IR Nutri Zinc, pregnant mother, extension, seed propagation*

1. INTRODUCTION

Food security does not solely provide self-sufficiency food. Rather, it includes households' food security to reduce food insecurity [1]. The main problem in food security issue is faster growth in demand side compare to supply [2]. Rice as one of the main staple foods, require special attention to fulfil its demand. Rice contributes 63% to total energy adequacy, 38% protein, and 21.5% iron [3]. Because of that fact, little people recognize rice content as a source of vitamin A, iron, zinc and amino acids; the essential element for health, especially children.

Likewise, limited in knowledge and understanding of society about nutritional food contributes to the physical growth of Indonesian children. Visible effects to toddler and adolescence, for example, are resistance to disease, impaired physical growth and mental development, and decreased learning ability [4]. These impacts are result of malnutrition during the growth phase, on which less Zink requirement can cause stunting in children [5].

A study on Basic Health shows that there is an increase in the prevalence of stunting in Indonesia from 36.8% in 2007 to 37.2% in 2013, meaning that 1 out of 3 children is classified as dwarf [6]. Surprisingly that those percentageis above the WHO threshold that set 20% and put Indonesia in high prevalence group, compared to other SEAN Countries and put together with Cambodia and Myanmar [7].

Kamil [8] refer to the data from Indonesian Population and Family Information Network (BKKBN) that 29.9% or 2.7 million todler are stunting. Thirteen districts in West Java with the highest stunting sufferer will join in stunting program namely Garut (43.2%), Sukabumi (37.6%), Cianjur (35.7%), Tasikmalaya (33.3%), West Bandung (34.2%), Bogor a(28.29%), Bandung (40.7%), Kuningan (42%), Cirebon (42.47%), Sumedang (41.08%), Indramayu Regency (36.12%), Subang (40.47%), and Karawang(34.87%) [9]. These areas mostly located in the Southern West Java.

Providing adequate nutritional intake to pregnant women is an effort for reducing the stunting. Thus, the pregnant women are expected to consume rice contain required nutritional content. To support this stunting issue, currently Ministry of Agriculture is developing 'biofortification rice' as a

solution to increase rice nutrition (vitamins and micro elements). [10] reveals the advantages of rice biofortified are: 1) the availability of nutrients in their natural form, 2) the seed can be developed without the need to re-biofortification 3) minimize the impact of malnutrition, 4) the rice still has high productivity, 5) environmentally friendly.

However, the biofortification rice program has not sufficiently resolved the stunting problem. Therefore, in collaboration with International Rice Research Institute (IRRI) Balitbangtan Ministry of Agriculture and Harvest Plus, has released a high-Zn-rice named Inpari IR Nutri Zinc. The legal document is a decree Minister of Agriculture Nomor 168/HK.540/C/01/2019 [11]. The variety has an average production as Ciherang variety, but with Zn content 29.54 ppm higher.

To introduce the Inpari IR Nutri Zincto the target users, it is necessary to know how effective this variety in reducing stunting, what characteristics of stunting farmers affect the successful implementation the variety, and how access of vulnerable families to quality food. Therefore, it is important to do study on model introduction of Inpari IR Nutri Zinc seed multiplication to overcome stunting in rural areas.

2. METHOD

The study was carried out in March 2020. Bantar Gebang Sukabumi, the study location, was selected purposively, because of high stunting rate in Sukabumi Regency during 2019. Primary data was collected through Focus Group Discussion (FGD) with local stakeholders in District and sub district that contribute with the SRV propagation: the officers, midwife, extension, and farmer group. Henceforth, those stakeholders were the entry point to introduce the SRV. Information collected from the FGD was: potential stakeholders to become a counterpart of the program, area of the propagation, and mechanism to operate the seed distribution to the targeted users. In addition the FGD also used to design a consensus of managing the seed propagation. Information taken from the FGD was analyzed descriptively to design a collaborative management of seed propagation. Meanwhile, a desk study was done to collect relevant data from the National Statistics Agency.

3. RESULTS AND DISCUSSION

Bantar Gadung district in Sukabumi has an area of 8,051 ha, consisting of 6,539 ha of agriculture land and 1,976 ha for non-agriculture. The land use per village in Bantargadung district can be seen in Table 1.

Table 1 shows the rice field in Bantar Gadung district (2045 ha) is larger than those used for non-agriculture (1976 ha) [12]. However, currently rice production are still low then have to be supplied from other area to meet the shortage. As well, un-optimum use of Inpari IR Nutri Zinc variety. These factors contribute to high number of stunting families.[13] states that the spread of rice high yield varieties are still very limited, for example distribution of Ciherang is 35.35%, Mekongga 10.05%, IR-64 7.96%, Situ Bagendit 4.61%, Cigeulis 4.44%, other high yield varieties 26.31% and local varieties 11.28%. In addition, not all those high yield varieties are available in Bantar Gadung sub-district.

Referring to Bantar Gebang population, it has 41,501 people and 11,756 families (Table 2). According to the average rice consumption of 111,58/kg/capita/yr [14],the need for rice in a year is 4.630.682 kg in 2020 or equivalent with ± 4.631 tons. Assuming the annual cropping index is 2 and productivity 3 milled dried grain (GKG), so it requires a rice plantation of 2,045 and it will produce 12,27 t/yr. This simulation has shown a surplus in rice production in Bantar Gadung sub-district.

Table 1 Village Area and Land use

No.	Village	Area (ha)	Agricultural Land (ha)			Non-Agricultural Land (ha)
			Rice fields	Not Rice Fields	total	
1	Bantargebang	1342	346	735	1081	261
2	Bojonggaling	1393	289	1005	1294	99
3	Bantargadung	1701	149	1265	1414	291
4	Mangunjaya	969	101	297	398	571
5	Limusnunggal	1468	832	153	985	483
6	Buanajaya	943	274	435	709	234
7	Boyongsari	695	54	604	658	37
	Total	8511	2045	4494	6539	1976

Source: Central Bureau Satistic (BPS) of Bantar Gadung District 2019

Table 2 Total population and families in Bantar Gadung District

No.	Village	Population	Family	Average Number of People per Family
1	Bantargebang	4,738	1,254	3.78
2	Bojonggaling	9,014	2,876	3.13
3	Bantargadung	10,548	2,671	3.95
4	Mangunjaya	3,587	1,018	3.52
5	Limusnunggal	6,198	1,868	3.32
6	Buanajaya	3,429	857	4.00
7	Boyongsari	3,987	1,212	3.29
Total		41,501	11,756	3.57

Source: BPS Bantar Gadung District 2019

As an effort to solve seeds availability, [15] has design a following plan: (1) restructuring nursery institution; (2) protecting genetic resources to be maintained and utilized as a source to develop local superior varieties; (3) strengthening breeders and seed supervisors; (4) strengthening local breeders and producers; (5) increasing role of private sector to support seedlings/nurseries; (6) developing seed industry. This action is important as study by [16] found that the use of new seed varieties only 30-40 percent with the rest using from harvesting or exchanging seeds with fellow farmers. In addition, [17] states that farmers' use of certified seeds are still 40 percent as farmers often have obstacles in cultivating new rice superior varieties.

In producing the superior seeds, farmers are facing number of obstacles and problems as summarized in Table 3. The seed availability during planting time is a very big constraint. This condition implies farmers on buying or borrowing seeds from fellow farmers, on which it is a long-time-released and have not been refined. Several ways to meet the needs of seeds such as maintaining rice productivity, field assisting and sorting seeds.

The unavailability of the extension seed on-time implies farmers provide the required seed by borrowing or buying from other farmers. Those seeds come either from local or high yield variety but has not been purified. Accordingly, it is important to guide the seed growers to become a partner for farmers in providing the VUB, Inpari IR Nutri Zinc. In doing so, several activities for example by maintaining productivity, providing assistance, and managing sorting. In addition, the field extensions have an important role providing the information about the variety being cultivated. As well, the seed propagation must be under monitoring and supervision of the extension agent in every critical phase of plant growth. For example, rouging monitoring that conducted closely in order to provide quality seeds available at planting time. Farmer also need mitigation action to prevent failure in seed being produced. Therefore, ssupport from all stakeholders is important. Even so, failures in achieving target production still exist due to use of local varieties and uncultivated on time.

Table 3 Problems and Plausible Solutions

No.	Problem	Mitigation
1.	Decreased productivity and crop failure	● Provision of High Yield Varieties (VUB) Seed ● Management of planting time according to Meteorogical, Climatological, and Geophysical Agency (BMKG) weather prediction
2.	Lacking of agronomic performance	● Assistance from field extension and plant pest officer ● Provides varieties desription book ● Disseminate information on the variety being cultivated
3.	Low seed quality	● Do monitoring and supervision on every plant growth's phase ● increase field coordination to maintain VUB's quality being harvested
4 .	The extension seeds cannot be distributed on time	assisting seed growers in succesful the seed production

3.1 Mechanism of the Nutrizinc Hyv Propagation

3.1.1 Sub-District level

Based on the results, the management of stunting at the sub-district level is carried out by the Health Center (Puskesmas). Fuctional Personnels in the Center that contribute in the stunting program

consist of doctors, nutrition officer and midwives. Doctors and nutrition officers based at the Puskesmas, whereas midwives stay in the village. The doctor take role with diagnosing patient categorized as stunting or pregnant women with chronic energy deficiency (KEK). If the diagnosed condition are caused by a certain disease, the patient will treat medically. On the other hand, treatment nutrition will be given if the patient diagnosed malnutrition. For this treatment, the nutrition officer provides counseling on nutritional intake, concerning types and amounts that have to be consumed by stunting patients, or mothers of stunting baby, and pregnant women with KEK. The village midwife together with the designated cadres regularly monitoring the patients the treatment's progress.

However, implementation of these process is often constrained by the patient's ability to provide quality food, in its type and quantity. This is because of low purchasing ability, less or unavailability land, and less access on required nutritious food. Ideally these factors can be eliminated through Indonesia Conditional Cash Transfer Program (PKH) assigned by Sub-District Social Officer. In addition the provision of nutritious food can be provided by local agricultural officers (BPP) through introduction the Inpari IR Nutri Zinc seed, propagation and dissemination.

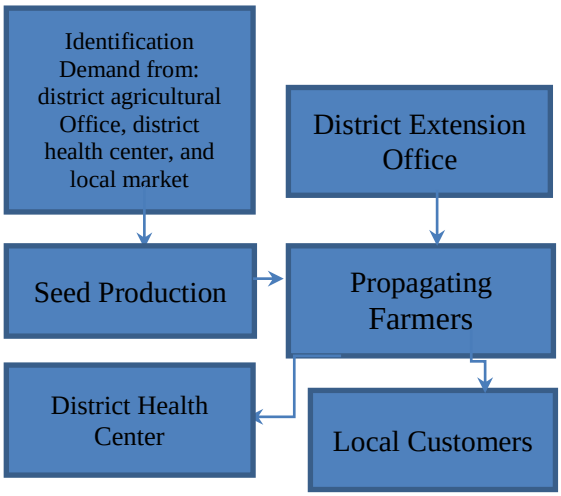
Considering these potential stakeholder collaboration, the Sub-District Head enable to coordinate them and lead the sub-district task force. Therefore, the task force elements comprise of Sub-District Head as a leader, Puskesmas personnels (doctor and nutritionist officer), BPP officer as food provider, and Sub-District Social Officer that support the patients' economic ability. The task force will manage propagation and dissemination Inpari IR Nutri Zinc seed through selection location for propagation.

3.1.2 Village level

Village midwives and cadres handle stunting at the village level. Cadres are local community appointed by the Village Head to guide community health and bridge community awareness to midwife in health issue, especially mothers and children. There is regular meetings in Posyandu (Integrated Service Post) between the community and village midwives on health awareness and monitoring stunting or pregnant women with KEK.

Meanwhile, a field extension (PPL) responsible for community development in agriculture. Farmers are accommodated in Farmer Groups Association (Gapoktan), on which one Gapoktan is arranged by two or several farmer groups (Poktan) from several hamlets in one village. In accordance with stunting handling, PPL and Gapoktan are main actors especially in the introduction and propagation of Inpari IR Nutri Zinc seeds. An integrated Village Working Group has been established and lead by the Village Head. Thus in village level, the task Force comprise of Village Head, Village Midwives, PPLs, and Gapoktan. The task force will design rules of the game: seed quantity to be planted with a village-funding, determine the location, which Gapoktan involved, and continuous monitoring and assisting from PPL. The harvested for the Village and Gapoktan. Village will keep half of the seed for next planting season and mill the rest of the seed become rice. Furthermore, the rice become the nutritious food for the selected patients recommended by the midwife. Currently the seed multiplication has been carried out in 6 villages, with a total seed propagation area of 8.25 ha.

Picture 1. Mechanism of Seed Propagation in Bantargadung District



4. CONCLUSION

The taske force in Sub-district comprise of Subdistrict Head, Puskesmas personnel (nutrition officers and doctors), and extension from BPP. The task coordinates the village and determines the propagated location by of the patients. In addition, the task force in village level is almost similar as those in sub-district level. Seed production in village level will be used as a source of nutritious food for patients and safe half of the production for next planting season. This model currently has been implementing in six village.

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