

Training Of Brown Rice Farmers In Tanjung Dolok Village, Marancar District, South Of Tapanuli

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Abstract: At present Indonesia is still facing four main nutritional problems namely lack of protein energy, iron nutritional anemia, lack of vitamin A, and interference due to iodine deficiency. The three problems above can be eliminated through the use of brown rice. Brown rice as food is the main source of carbohydrates, protein, beta-carotene, antioxidants, iron and vitamin B. In North Sumatra, brown rice planting land can be identified such as in Langkat, Karo, Simalungun, Serdang Bedagai, Deli Serdang, Nias, and South of Tapanuli . One specific local brown rice planting location that implements organic rice farming is located in Tanjung Dolok Village, Kec. Marancar, and the Village of East Angkola, South Tapanuli, North Sumatra. Therefore, it is very important and of strategic value to do the Community Mono Tahun Village Development Devotion activities through the activity of analyzing internal factors, external factors, development strategies and conservation of organic brown rice as an effort to foster creative economic activities. The Dame Na Hita system, brown rice farmers is one of the most strategic and effective alternative solutions to problems with economic, social and ecological benefits. Induction of knowledge about the identification of quality local specific rice seeds, appropriate cropping patterns, integrated pest control, and the use of vegetable pesticides is expected to increase the productivity of agricultural products. The Mono Tahun Program is based on research and synergy with the community to achieve the specific goal of realizing Tanjung Dolok Village as a model of a leading partner village with the achievement of increasing food and livestock commodities supporting community needs, village development and national food security.

Index Terms: Training, brown rice, silotik, food security, sustainable, Marancar, South of Tapanuli.

1 INTRODUCTION

The Batak people generally live by farming and plantation, as is the case with the Angkola Batak community around the location of the Batangtoru Hydroelectric Power Plant. On the land which has high soil fertility, many rice fields are owned by the community. Meanwhile, in areas that lack fertility and do not allow water to flow, people make plantations from various types of cultivated plants, such as coffee, rubber, petai, durian, chocolate, jengkol, salak, and sugar palm. Therefore, it is not surprising that the dominant vegetation type in the Batangtoru hydropower area is cultivated plants, such as coffee, rubber, petai, durian, chocolate, jengkol, salak, sugar palm, and rice fields in specific areas. The social organization of the Batola Angkola community like the other Bataks is built based on clan. The kinship system of the indigenous Batak Angkola tribe is based on patrilineal (adhering to male lineage). The social organizations of the Batak Angkola tribe include:

1. Nucleus Family (father, mother and children)
2. Marga group (consisting of several families in one clan)
3. Sub district (consisting of many families from several clans)
4. Village (consisting of several clans)
5. Customary Institutions (Hatobangon) consisting of clan representatives in each village. Raja Pamusuk (Harajaon) is a traditional figure appointed based on the lineage of the ancient King. Community land ownership is controlled by "Raja Luhat" or customary landowners who have traditionally controlled land based on the history of territorial control. Raja Luhat gave land tenure rights/permits to the people who lived in Luhak (adat area) as a place for farming.

This land acquisition was recognized by the whole community especially Raja Luhak, Harajaon and Hatobangon and other communities. This arable land has become the property given by Raja Luhak to individuals and can be sold or transferred. Indonesia still faces four main nutritional problems, namely low protein energy, iron nutrient anemia, lack of vitamin A, and interference due to iodine deficiency. The three problems above can be overcome through the use of brown rice. Brown rice as a functional food which contains active components of nutrients that can provide health benefits, such as: [1]. Components in food classified as functional food are vitamins, minerals, sugar, alcohol, unsaturated fatty acids, amino acids, dietary fiber, prebiotics, probiotics, choline, lecithin and inositol, carnitine and squalene, isoflavones, phytosterols and fitostanol, and polyphenols as healthy food [2]. North Sumatra Province has identified brown rice producing centers in Langkat District, Serdang Bedagai, Simalungun, Karo, Dairi, Nias and South of Tapanuli. South of Tapanuli consists of 12 districts, namely from Padang Sidempuan, Sipirok, Saipar Dolok Hole, Arse, Aek Bila, West Angkola, East Angkola, South Angkola, Batangtoru, Batang Angkola, Sayur Matinggi and Marancar. Marancar District, especially in Tanjung Dolok Village and Sijungkang Village, East of Angkola district, North Sumatra still found local specific brown rice planting which is very potential as a source of food for the people of South of Tapanuli (Figure 1).



Figure 1. Map of mono year service locations in Marancar and East of Angkola, South of Tapanuli (Source: Internet, 2019)

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2. LITERATURE REVIEW

2.1. Brown Rice Farmers in South of Tapanuli

Head of the South of Tapanuli Agriculture Office (South of Tapanuli), Ir Bismark Siregar revealed "In 2016, as many as 181 tons of rice production increased compared to 2015 crop production of 169 tons more." While the amount of rice needs in South of Tapanuli in 2016 was as much as 134 tons, and for food needs 39 tons more, so that in 2016, a surplus of 84 tons of rice or the equivalent of 67.89% of rice production was produced by South of Tapanuli from the paddy field width in 2016 covering 17,170 hectares, compared to 2015 where the paddy field width was 17,847 Ha. The production of the 677 Ha paddy field area was reduced due to the conversion of the agroforestry land by the community by planting oil palm, rubber and coffee. However, in 2017, the South of Tapanuli Agriculture Office has increased the productivity of paddy agriculture with a target Planting Index of 2.5 planting rice commodities on an area of 48,046 hectares. The increase is by means of intensification through the Planting Index (IP) by rehabilitating the village irrigation network, the use of superior seeds (blue label), the Jarwo system planting method (jajar legowo), the SRI (Rice Intensification System) method, hazton and others, timely organic fertilizer, right on target, right on dosage, and maximizing agricultural machinery tools [1]. Added technical irrigation, farming roads (for the mobilization of transport of agricultural products), pending sale houses (brown rice middlemen), agricultural market information updates are improved [2]. In addition, the support of reliable PPL (Field Extension Officers) will be intensified where farmers are invited to good agricultural practices. Furthermore, the development and development of Demonstration Plots and Demonstration Farming will be trialed since 2019. When intensification is carried out by making or developing new paddy fields. In the developing its agriculture, the South of Tapanuli Agriculture Service still uses the Mekongga, Inpari 29, 30, 31, 32 and IPB 30 S varieties as well as locally specific brown rice, such as silotiks. To maintain the quality and purity of rice, the South of Tapanuli Agriculture Office conducts counseling for farmer groups and SNI standard rice mill assistance to farmer groups. As for marketing rice production, especially brown rice, it still meets the needs of the local people in South of Tapanuli. Rice and brown rice are widely produced from planting sites in Tantom Angkola, Sayur Matinggi, Batang Angkola, Angkola Timur, Marancar, Sipirok, and Batangtoru [3]. The area of upland rice or upland rice in Tapsel is still far behind compared to paddy rice. To increase upland rice production, the Agriculture Office of the Tapsel District and the North Sumatra Agricultural Technology Assessment Office began planting upland rice of Inpago 7, Sigembiri and Inpari varieties. The potential of Inpago 7 rice production, can reach 4-5 tons per hectare, higher than other upland rice which reaches 3 tons per hectare [4]. This limited area of land has encouraged intensive land exploitation with the use of inorganic fertilizers (urea, TSP, KCI) which are increasing. As a result, the land has become less responsive to inorganic fertilization applications. In addition, the conversion of agricultural land to non-agriculture can reduce rice production. Therefore the potential of upland land that needs to be developed and find other alternative sources, such as the use of oil palm land, rubber plantations and others [5]. The Indonesian Center for Rice Research,

Agricultural Research and Development Agency has released the BP1924-1e-5-2 strain under the name Aek Sibundong variety. To evaluate the responses and preferences of consumers to brown rice offbrown, research was carried out in seven provinces, namely North Sumatra, West Java, Central Java, East Java, Bali, South Sulawesi, and NTB. From the Data Respondents in the villages generally prefer the taste of brown rice compared to city respondents, except respondents in the provinces of East Java and Bali. The level of knowledge of respondents in North Sumatra, Bali and NTB who are accustomed to eating brown rice is better than other provinces. Furthermore, on upland rice and silotik detected major pests, including leafhoppers, rice stem borer, Nilaparvata lugens, Gryllotalpa sp and golden snails (Pila ampullacea). The existence of an irrigation system in Indonesia makes the distribution of golden snails easy, because it is carried by water flow [6,7]. Golden snail is a herbivorous animal and its food is very greedy so that several regulations are issued which limit or even prohibit the cultivation and circulation of golden snails. The potential use of golden snail pests as fertilizer for rice plants is still rare. Therefore, in addition to inventorying varieties of brown rice varieties, the development of appropriate technology to utilize golden snail pests as productive biological fertilizers for increasing the productivity of brown rice is needed. Therefore, it is very important and of strategic value to carry out the USU Talent Development Partnership (Mono Tahun) in the Village Development activities to achieve specific objectives using 2 Partners, namely: Hamparan Farmer Group and Dame Na Hita Farmer Group. Community service activities in brown rice include: 1. Inventory of locally specific brown rice varieties; 2. Analyzing internal, external, development strategies and conservation of organic brown rice through local culture/wisdom; and 3. Management of agriculture as education and ecotourism as an effort to develop creative economic activities. The Dame Na Hita system, one of the most strategic and effective alternative solutions to problems with economic, social and ecological benefits. The general objective of the Mono Year program by introducing the concept of food security to partners is an alternative use of brown rice in developing the concept of environmental sustainability, through sustainable activities in the form of education, scientific research, training, sales management and educational tours. Induction of knowledge about local specific rice seeds, appropriate cropping patterns, integrated pest control (IPM) and the use of vegetable pesticides as productive liquid fertilizers are expected to increase the productivity of agricultural and livestock products. The Mono Tahun Program is based on knowledge, research and synergy with the community to achieve the specific goal of realizing Tanjung Dolok Village and Angkola Timur Village as models of leading partner villages with achievements in increasing food commodities supporting community needs, village development and national food security.

2.2. Priority Issue Urgency

To anticipate the threat of genetic erosion and extinction, it is important to collect and conserve to preserve local varieties of brown rice. Until now there are around 54 local varieties of brown rice that have been collected from exploration at the Gen Bank Center for Research and Development of Biotechnology and Agricultural Genetic Resources. One of them is assumed to be locally specific Silotik brown rice, pink

brown rice [12], where the source of origin and distribution have not yet been identified in Tapsel. Figures 2 and 3 below show the types of brown rice that are often grown in Tapsel, including Kasumbo, Silotik (the origin area of Sipirok), Inpari and Mekongga.



Figure 2. Lotik brown rice varieties, IR 64, Inpari, Mekongga in South of Tapanuli (Source: Direct Photos, 2019)

The main reason for collecting germplasm of a species from an area is to anticipate genetic erosion or extinction [13]. Traditional farmers grow crops according to their skills and develop the resources they need. The process begins with the domestication of wild species, followed by selection and finally obtained the species in accordance with the wishes [14]. In line with the development of technology in agriculture, the discovery of new rice cultivars is developing rapidly. The superior properties of rice plants such as high yield, disease resistance, drought tolerant, and various other advantages have been possessed by modern rice cultivars. Increasing productivity is one of the main goals in plant breeding programs, including rice. By using conventional technology and modern technology (biotechnology), plant breeders can produce short-grain rice varieties, new types of rice, and hybrid rice [15] and [16]. This is a paradox because on the one hand this success can threaten the diversity of local rice genetic resources and cause genetic erosion because farmers increasingly rarely cultivate local rice. Genetic erosion is caused by a number of factors [11]. First, agricultural change. Various types of local varieties are threatened by uniformity through the development of modern varieties. Likewise important local food plants will be lost when replaced by other more profitable and quickly harvested plants. Second, socioeconomic changes. Rural residents leave agriculture and move to non-agricultural activities in the city. Third, overexploitation. Various species of food crops are lost due to overgrazing and uncontrolled harvesting from nature. Overexploitation can lead to loss of species, even damage to habitat. Fourth, plant habitat is damaged due to urban expansion, land clearing, construction of dams and roads, and overexploitation. Fifth, there are competitors in the form of pbrownators, pests and diseases that can endanger the survival of plants. Sixth, natural disasters such as drought, floods, disease outbreaks, and industrial pollution. Figure 3 below is the location of rice cultivation in Tanjung Dolok Village, Kec. Marancar, Kab. Tapanuli Selatan, North Sumatra.



Figure 3. Location of rice planting and irrigation in Tanjung Dolok Village, Kec. Marancar, Tapanuli Selatan (Source: Direct Photos, 2019).

3. METHOD OF IMPLEMENTATION

3.1. Activity Plan

The Mono Year Service activity titled "Model of the Brown Rice Peasant Partner Village in Supporting Food Security" was carried out in the villages of Tanjung Dolok, Kec, Marancar and East Angkola from May 2019 to December 2019. Strong motivation from the partners to produce brown rice harvest quality superior local is one of the strong capital to carry out community service activities in the area. Therefore it needs to be resolved and synergized together between the academic community and the community in solving this problem. To support the problem solving strategy of partners in brown rice farmers, the science and technology will be carried out covering 4 stages as follows:

1. Preparation stage

In the preparation stage, a site survey is conducted, an inventory of partner problems, problem analysis and finding solutions with a science and technology approach. Then the problem was outlined in the form of a community service proposal submitted to the USU Talent Service Program.

2. Implementation phase

At the implementation stage, the Mono Tahun team will identify silotik brown rice seeds, manufacture vegetable pesticides, design a rice dryer to be used in community service activities. The device will be designed, tested and installed at a community service location in South Tapanuli.

3. The guidance stage

During the mentoring phase, USU's service team will assist directly by a number of students by detecting specific local rice seeds, identifying pests and diseases, and testing the use of rice dryers.

4. Brown rice farmer group training

Training and forming a Focus Discussion Group (FDG) in the identification of good local specific rice seeds, demonstrations and training in controlling pests and diseases of rice plants using plant-based pesticides.

3.2. Work Procedures

a. Brown Rice Research

In the First Year, the Community Service was conducted from the first three months (February-April 2019), land preparation, preparation of vegetable pesticides and design of rice holding equipment were carried out. Furthermore, in the next 4 (four)

months of service activities (May 2019 to August 2019) demonstrations were used to use quality seeds, application of vegetable pesticides, and data analysis obtained from rice farmers included inventorying insects, dominant pests and calculating the productivity of rice produced. Then the ISSN textbooks and national and international seminars and publications in international reputable journals were made. Mono Tahun was held in two Mitra Villages, the first was in Tanjung Dolok Village, Kec. Marancar, Kab. Tapsel. The two villages are around 390 km from the USU Medan campus, reached by car about 9-10 hours drive (Figure 1). Marancar district is divided into 12 villages, consisting of Aek Nabara Village, Aek Sabaon Village, Gapuk Tua Village, Haunatas Village, Huraba Village, Marancar Village, Marancar Godang Village, Mombang Boru Village, Pasar Sempurna Village, Simaninggir Village, Sugi Tonga Village and Tanjung Dolok is a protected forest area (HL) Marancar. The inhabitants of this village live as many as 532 people, consisting of 280 men and 252 women. The main livelihood of the population is rice farming. Irrigation Channel Development for Tanjung Dolok Village, Kec. Marancar, Tapsel sourced from North Sumatra II B2WS Bansos funds amounting to Rp 178 million began. Whereas in the Second village, Desa Angkola Timur, Kab. Tapsel is dominated by Civil Servants and ranchers with a population of about 3,000 people. There are three partners in the community service activities of the Mono Tahun skimmers namely Hamparan and Dame Na Hita, Brown Rice Farmers. With more than 3 years experience, the Hamparan group, led by Mrs. Argawati Siregar, focuses on growing brown rice. When the Dame Na Hita 1 group, led by Wahdi Parulian, was established in January 2014, this brown rice farmer was able to implement Mono Tahun service and be able to share resources with the proposing team. Initiating and organizing communities increases the welfare of brown rice farmers and educational tours by mutual assistance and community self-help. With the potential of a unique village, the combination of Marancar Protection Forest, fresh air, cool water, comfortable atmosphere and the great desire of partners and communities to realize Tanjung Dolok Village and Sijungkang Village as models of superior villages with the achievement of specific local, local, brown rice centers in education to support resilience potential food.

4. RESULTS AND DISCUSSIONS

Implementation of community service activities for brown rice farmers is carried out through the following activities:

1. Short Training (ST)

ST on identification of silotik brown rice seeds, making vegetable pesticides, design of rice drying equipment used in community service activities with the main objective to increase creativity, diversification and income of brown rice farmers. The results of the training showed that brown rice farmers in Tanjung Dolok village had the basic skills to identify silotik brown rice seeds, taught how to make vegetable pesticides from plants around paddy fields so as to increase the knowledge and skills of brown rice farmers (Figure 4).



Figure 4. Training in seed identification, land management and HPT control of brown rice (Source; Direct Photo, 2019).

2. Enhancing knowledge and skills by forming a Focus Discussion Group (FDG)

FDG with identification of good local specific rice seeds, detection of soil nutrients and demonstration and training in controlling pests and diseases of rice plants using plant-based pesticides. At the session of the Focus Discussion Group (FDG), the Hamparan rice farmer group and Dame Na Hita conducted a question and answer process and discussed the determination of superior and certified rice seeds (white or blue label), tillage (dolomite, plow, regular fertilization), control rice pests and diseases in an integrated and environmentally friendly manner (traps, lamps, tools, cut, pruning weeds, and making vegetable pesticides) (Figure 5). From the discussion it was found out that the leader of the leaders in Marancar, there were two other local specific types of brown rice, such as Sipulen and Sihalean.



Figure 5. Focus Discussion Group (FDG) of brown rice farmers in Tanjung Dolok, Marancar (Source: Direct Photo, 2019)

3. Developing the spirit of togetherness and sustainability

of the program by involving the village government, related agencies and other parties who are there to help develop a business based on brown rice products in the village of Tanjung Dolok.

With the use of brown rice, it is predicted that Indonesian people's food consumption patterns tend to be higher with the use of higher quality carbohydrate sources. On the other hand the source of fiber, vitamins, glycemic, micro-nutrient elements in the form of minerals consumed by the community are categorized as functional foods with increasingly nutritional value, so as to prevent the occurrence of degenerative diseases. However, due to the community's low level of knowledge and productivity, this potential has not been used optimally. Therefore it is necessary to provide assistance in providing information to the community about the procedures for processing brown rice into highly nutritious food, in addition to being able to add value to the economic community. The selection of partners is more focused on the Hamparan Poktan (farmer women's group) and Poktan Dame Na Hita (the group of male farmers) because these two groups focus on brown rice farming, have a relatively long and flexible, painstaking time and generally like to add knowledge and skills to increase family income. The benefits that have been gained by partners (women farmer groups and Ilesaki farmers) are:

1. Increased knowledge and skills in determining superior rice seeds, processing paddy fields, detection and control methods of pest and disease attacks using color traps and lights.
2. Increased knowledge and skills to produce vegetable pesticides. The implementation of the partner in the village of Tanjung Dolok certainly encountered brown obstacles and obstacles, namely limited business capital and production technology (drying) for the development of the brown rice business, still a reason for the women farmer groups in starting and developing the business of brown rice farmers. Therefore, the dedication team of the University of North Sumatra designed a tool for drying brown rice as a record of evaluating these constraints and obstacles, which was carried out with a subsequent visit to brown rice farmers in Tanjung Dolok Village, Marancar District, South of Tapanuli Regency, North Sumatra.

5. CONCLUSIONS AND SUGGESTIONS

5.1. Conclusions

From the Brown Rice Education Model activities with 2 partners (Overlays and Dame Na Hita), each partner numbered 20 people in Tanjung Dolok Village, Marancar District, South Tapanuli Regency, the following results were obtained:

1. Increased knowledge and skills through training activities for identification of silotik brown rice seeds, making vegetable pesticides, design of rice drying equipment used in community service activities.
2. Increased knowledge and skills by forming a Focus Discussion Group (FDG) in identifying good specific local rice seeds, demonstrations and training in controlling pests and diseases of rice plants using plant-based pesticides
3. Developing the spirit of togetherness and sustainability of the program by involving the village government, related agencies and other parties who are there to help develop a business based on brown rice products in the village of Tanjung Dolok.

5.2. Suggestion

Based on the discussion and conclusions above, we put forward a number of suggestions, including:

1. Obstacles in the form of enthusiasm for initiating entrepreneurship are still very low, so people need to be motivated and successful examples for the development of businesses based on brown rice products.
2. There needs to be support for the follow-up program, to improve the enthusiasm, skills and marketing capabilities of the farmers' groups and mothers in Tanjung Dolok Village, Marancar District, South Tapanuli Regency

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2. The Hamparan and Dame Na Hita brown rice farmers group and the community apparatus (traditional leader) in Tanjung Dolok Village, Marancar District, South of Tapanuli Regency.

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