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Appropriate Technological Innovation Towards An Independent Village Based On Agrotourism In Sumbergedang Village

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Abstract
Sumbergedang Village is one of the villages located in Pandaan District, Pasuruan Regency, East Java Province, which has green and cool natural conditions because it is located at the foot of Mount Penanggungan, West Side and has views of Mount Arjuno. Potential natural resources include rivers with a calm flow from springs throughout the year, livestock farming with sheep, goats and fish and around 30 springs. The aim of the Assisted Village Program activities is to exploit this natural potential into agrotourism so that it becomes an independent and prosperous village.
The activity method involves direct assistance by the entire program implementation team and 5 students who work in the field for one semester. The activity begins with preparation by determining the schedule & compiling measurement instruments to carry out pre- and post-activity evaluations. Training includes: Building an entrepreneurial spirit, business motivation, digital bookkeeping and marketing, training on the operation of coper and feed ingredient flouring machines, making feed formulas and mixing feed, training on making various chips and drinks, training on the use of chopping machines for packaging chips and packaging drinks as well as Institutional development is directed at fostering group management.
The results of the activity include: all partners consisting of livestock and fish farmer groups, village PKK, BUMDES and MSMEs increased their entrepreneurial spirit after receiving business motivation training. The complete result of this Assisted Village activity is that the use of appropriate technology (TTG) in the form of a multipurpose machine is able to increase the weight gain of sheep by more than 150 grams/head/day so that fattening time is shorter. With a fish feed machine, groups can make their own feed, thereby reducing feed costs to Rp. 10,000/ kg feed. The use of a chopping machine can increase the production capacity of chips to 150/200 kg/day and the use of a beverage packaging machine can increase the capacity of sinom drinks to 25 liters/day. The conclusion of this activity is that the application of appropriate technology is really needed by society to increase people's income and welfare.

Keywords: *Sumbergedang, Appropriate technology, Chips MSMEs, Beverage MSMEs, Digital Marketing*

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I. Introduction

Sumbergedang Village is one of the villages located in Pandaan District, Pasuruan Regency, East Java Province, consisting of 13 (Thirteen) Hamlets divided into 50 RTs and 24 RWs. Sumbergedang Village has extraordinary exotic natural potential to be developed into an independent and prosperous village, namely: 1. River with water source throughout the year 2. Agriculture of banana plants along the river, rice, cassava, shallots 3. Livestock farming There are sheep, goats and fish 4. There are around 30 springs spread across 13 hamlets 5. Tourism potential: There is the Talang Abang Water Bridge.

The existing potential livestock (sheep, goats and cattle) are spread throughout the community and some are held collectively managed by the Mendo Bumi livestock farmer group. The problem with livestock cultivation is that breeders do not understand how to prepare concentrate feed so that the weight gain for sheep is around 50 – 75 grams/head/day and cattle is no more than 500 grams/head/day.

The second potential is the development of various ornamental fish (40 types) and consumption fish (catfish, gourami and tilapia). The development of various types of ornamental fish is handled by the ornamental fish community group "Mina Jam3" and marketing has been spread to several shops selling ornamental fish with a total of around 10,000 per month. The problem with fish farming is that it relies on expensive factory feed so the profits are minimal, as well as viral and bacterial diseases which cause many deaths.

The third potential is to have an SME that makes various types of chips, especially banana chips and drinks (rice kencur and sinom). The problem with this SME is that the chip chopping is still manual, production is still small at 50 kg/day, drinks don't last for only 3 days so market reach is limited and packaging as is (no labels and product specifications).

Through this village-based service program, several innovations have been developed that can increase the productivity of livestock, fish and SMEs, thereby increasing community income and welfare.

Activity Method

Mentoring activities will be carried out for three years starting in 2023 with several activities including:

1. Socialization of activities and training: Implementation team and partners of the Sumbergedang Village government together with livestock groups, fish farmer groups and other organizational groups (PKK, UMKM, Pokmas and Bumdes). Determining Schedules & Preparing Measurement Instruments to carry out Pre- and Post-Activity evaluations.

2. Mentoring and Training

Mentoring and training for several activities which include:

a. Assistance in making ready-to-eat animal feed for goats, sheep and cattle.
b. Assistance in making fish food in the form of pellets that can float
c. Assistance in making various types and shapes of chips according to village potential
d. Assistance in making long-lasting and healthy sinom and kencur rice drinks.
e. Assistance with halal certification for all food SMEs and food stalls in Sumbergedang village.
f. Activity Evaluation

II. Results And Discussion

1. Socialization and Training. In this socialization, a pre-test was carried out to see the extent of the participants' competencies (in entrepreneurial knowledge, management and marketing as well as the enthusiasm to become an entrepreneur). Participants present at this stage:

- Village Head and village officials, BPD and BUMDES: 6 people
- Group of goat/sheep breeders: 4 people
- Fish farming group: 3 people
- PKK and MSME groups: 7 people
- Village tourism management group: 5 people

During this socialization, training was also provided: training materials included: Building an entrepreneurial spirit, business motivation by motivators, digital bookkeeping models and on-line marketing. This is in accordance with the explanations of Pramuja (2020), Ratih (2019), Ratih (2020) and Ratih (2022) that motivation plays a very important role in building an independent spirit and entrepreneurial spirit. Evaluation of activities: pre-test and post-test are carried out which contain aspects: level of knowledge and entrepreneurial spirit. The motivational results are able to increase the entrepreneurial spirit from a low initial value to a very strong one. Providing this motivation is important in order to encourage participants' business enthusiasm. Faqih and Susanti (2016) added that motivation programs are created so that farmers are able to increase their knowledge and skills in farming, so that with the agricultural extension methods and techniques delivered by motivators to farmers, they are delivered well, meaning they can be understood and accepted by farmers, they can increase farmers' knowledge and skills in farming.

Figure 1. Digital Marketing and Business Motivation Training

2. Assistance in making ready-to-eat animal feed (complete feed). The ready-to-eat feed produced is feed for goats, sheep and cattle by providing the assistance of multi-purpose machines for grass cutting and flouring. Ready-to-eat feed consists of 80% forage and 20% concentrate with a feed protein content of 16% and TDN 70%. Planting of superior pachong grass on 3000 meters of village land as forage and grass seeds to be distributed to people who are interested in planting. Before making ready-to-eat feed, grass and concentrate ingredients, namely corn cobs, must be chopped first. For this reason, this group of breeders needs a machine that can chop and flour or a multifunctional chopping machine. This was explained by Ismail et al (2021) that farmers need tools so that the process of chopping or chopping grass and corn cobs can save time and energy, so chopping or chopping requires a short time. A grass and corn cob chopper is really needed by breeders. In the process of making this grass and corn cob chopper machine, a strong frame is required, the blade is sharp for several cuts, ergonomic, the price is affordable. The composition of forage and reinforcement for making TMR consists of 20% forage and 80% reinforcement with a protein content above 14 % and TDN of more than 70% has been able to accelerate fattening (Sujono, 2021; Sujono, 2022). With this ready-to-eat feed composition, it can increase the growth of goats and sheep to above 150 grams/head/day with a fattening time of only 3 months (Sujono et al., 2022).

Figure 2. Use of a Lawn Mower and the Process of Making Ready-to-Eat Feed

3. Assistance in making fish food. Fish feed is produced in the form of pellets that can float by providing a fish feed making machine in pellet form. Floating fish feed like factory production (50 – 100 kg/day): 30% protein content, 3000 kcal energy at a price of IDR 20,000/kg. Feed that has been made in the form of pelleted and floating feed. This is in accordance with Rihi (2019) that pellet feed is a form of artificial food made from several kinds of ingredients that we mix and make into a dough, then mold it so that it is a small stick or circle. The size ranges from 1-2 cm containing 40% , protein, 5% fat and 30% carbohydrates. Pellet feed is not in the form of flour, not in the form of granules, and not in the form of a solution. The feed that is made is cheaper than the price of manufactured feed. This is in accordance with Achadri et al (2020) that the need for fish feed reaches 60-70% of the total need for aquaculture, so it is necessary to look for alternative feed to reduce costs and increase profits for fish farmers. Providing assistance with a machine for making floating pellet fish feed really helps reduce the feed costs for fish farmers in Sumbergedang Village. This is in accordance with the explanation of Haidi et al (2022) that by making a fish feed pellet production machine with a production capacity of 80 kg/hour by utilizing raw materials for feed production from local natural resources, it is hoped that it can meet the needs of fish farmers.

Figure 3. Process of Making Pellet and Floating Fish Food.

4. Assistance in making various types and shapes of chips. The chip products produced are in accordance with the potential of Sumbergedang village and are considered small businesses. It was explained by Pranata and Arifin (2024) that a small business means a productive business that stands alone with total assets under 200 million, excluding land and buildings where the business is located and has annual sales of up to Rp. 1 billion, can be concluded as a business carried out by lower middle class people. For this reason, it needs to be empowered considering that these small businesses are able to create their own employment opportunities and help revive the economy. Assistance starts from selecting raw materials, assistance with multi-purpose chopping tools and automatic packaging, digital processing, packaging and marketing.

The types of chips produced are banana chips (main), carrots, vegetables (moringa), ketala rambat, cassava and potatoes. To increase production and packaging capacity, efficient technology assistance (TTG) is provided in the form of a multi-purpose chopping machine with a capacity of 50 kg/hour and a packaging machine plastic. TTG is a type of technology that is suitable for small-scale, grass-roots economic activities and focuses on the community economy. TTG is used to solve technological problems by providing sustainable solutions that benefit local communities, especially MSMEs. The use of multi-purpose, automatic chopping machines and automatic packaging machines is able to increase production capacity to 150 – 200 kg/day with better quality and halal certification. Rahmiyati and Rahim (2015) explained that TTG must produce more value, be economical in using resources including energy, be durable, be able to generate financial profits and be accepted by society.

Figure 4. Chopping Chip Materials and Packaged Chip Products.

5. Assistance in processing healthy sinom drinks and kencur rice. The superior beverage products in Sumbergedang Village are kencur and sinom rice drinks which are produced by MSMEs. The weakness of this drink product is that it doesn't last long, only three days and is not yet halal certified. This kencur and sinom rice herbal drink product is a home product that is processed by the owner himself, starting from the basic ingredients, manufacturing, to packaging and marketing. For this reason, assistance is needed starting from selecting raw materials, assistance with automatic packaging equipment, processing innovation, assistance in obtaining halal certification and digital-based marketing. The process of making liquid kencur rice consists of kencur rhizomes, ground rice and sugar then pounded or ground until smooth, then water is added, the juice is squeezed, after that the kencur rice is put into bottles and then sold on the market. The weakness of the kencur rice drink product is that it is easily damaged/does not last long. One alternative to extend its shelf life is to add preservatives, such as sodium benzoate (Ulya et al., 2020). Sodium benzoate is active in inhibiting the growth of bacteria and yeast and extending shelf life. This was clarified by Oktaviana (2012) that the mechanism of action of sodium benzoate as a preservative is based on the permeability of microbial cell membranes to undissociated benzoic acid molecules. At a pH of 4.5, the benzoic acid molecules can reach microbial cells whose cell membranes are permeable to dissociated benzoic acid molecules. Microbial cells that have a neutral cell fluid pH will be entered by benzoic acid molecules, so the benzoic acid molecules will dissociate and produce H+ ions, thereby lowering the microbial pH. Digital marketing is very strategic for increasing turnover and market reach. As emphasized by Wahyuni and Nurdian (2021), the benefits of digital sales can be through online sales, in the form of digital marketplace accounts, of which there are many types, including Instagram, Shopee, Lazada, and so on. These accounts can be used for online sales, to upload photos/videos of the products to be sold and provide information on the products, so that consumers can find out what the seller is selling. Appropriate technological assistance in the form of an automatic packaging machine and the addition of Na benzoate preservative can increase production capacity to 100 cups/hour and drinks can last up to 3 months.

Figure 5. Packaged Sinom and Sinom Drink Ingredients

6. Assistance with halal certification. This halal certification assistance is provided to all food and beverage MSMEs in Sumbergedang village. The number of SMEs assisted to obtain halal certification is 5 MSMEs considering their important role in the family and community economy. Widyaningrum (2022) emphasized that the culinary sector as part of Small and Medium Enterprises (MSMEs) is the sector that is considered to contribute the most to National Gross Domestic Product (GDP) at 32.50%. Not many MSMEs in this region are certified in terms of food safety or halal food. According to Sartika (2020), unsupportive behavior of food handlers will cause food safety problems. More specifically, employee hygiene and the cleanliness of production equipment are the sources of contamination that have the greatest potential to occur in the production process. This halal certification is expected to encourage increased productivity and competitiveness of the products produced (Agustina et al., 2019).

The complete results of the evaluation of activities for two years before and after mentoring are shown in Table 1.

NO	Activities	Before Training	After Training
1	Level of Knowledge: business development motivation	68% very weak and weak	94% changed to strong and very strong
2	Livestock Group Assistance	- Cannot make concentrate feed -Growth of goats and sheep is 50 – 75 grams/head/day with a profit value of IDR 3500/head - IDR 4200/head. - The length of time for fattening sheep is more than 6 months of harvest	-Can make ready-to-eat feed with 16% protein content and 75% TDN at a price of IDR 2600/kg. -Growth of goats and sheep can be above 150 grams/head/day. With a profit value of IDR 10,500/head -The fattening time for sheep and goats is only 3 months.
3	Assistance to Fish Farmer Groups	- Not yet able to make their own feed (using factory feed priced at IDR 30,000/kg). -Productivity below 60%	-Can make your own feed with 30% protein content, 3000 kcal energy at a price of IDR 20,000/kg. Productivity: survival rate of spawning results is more than 80%, fish harvest weight increases by 10% and feed efficiency is Rp. 10,000/kg cheaper.

4	Chips Production	- One type of chips (banana chips) and one shape (chips/plates). - Production capacity 25 kg/day. - The packaging is not attractive/often leaks and is easily damaged (sluggish)	- Various types of chips: banana, carrot, yam, cassava, potato, spinach and moringa. -Total production capacity 150 – 200 kg/day. - The packaging is safer and lasts 3 months, interestingly there is a brand and explanation of the composition
5	Production of Sinom and Kencur Rice Drinks	- Packaging of kencur rice drinks in 1 liter bottles and 600 ml sinom without labels (plain). -Drinks sold do not last long (only 3 – 4 days), so marketing is limited. -Production capacity is limited to around 5 – 10 ltr/day.	- Additional packaging for sinom glass sizes and kencur rice with brand labels,omposition and benefits -The drinks produced can last for around 3 months so marketing is wider -Production capacity increased by around 25 liters/day.
6	Halal Certification	- PIRT Permit for only 2 SMEs -Only 2 SMEs have been certified	- All food and beverage SMEs have PIRT permits -5 SMEs in the halal certification process

III. Conclusion And Suggestions

The conclusion of this Assisted Village activity is that the use of appropriate technology (TTG) in the form of a multipurpose machine is able to increase the weight gain of sheep by more than 150 grams/head/day so that the fattening time is shorter by no more than 3 months. With a fish feed machine, the group can make their own feed, thereby reducing feed costs to Rp. 10,000/kg of feed and additional income from feed efficiency of Rp. 500,000/day. The use of a chopping machine can increase the production capacity of chips to 150/200 kg/day and the use of a beverage packaging machine can increase the capacity of sinom drinks to 25 liters/day.

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