

IMPROVEMENT OF CENTRAL DEVELOPMENT INNOVATION OF EDU PARK NATURAL TOURISM AREA BASED ON ORGANIC AGRICULTURE IN BANYUROTO VILLAGE, SAWANGAN, MAGELANG

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ABSTRACT

Banyuroto Village, Sawangan Subdistrict, Magelang Regency, Central Java is one of the agro-tourism areas which produces high local food potential. This area is located right on the edge of the Merapi Tourism Park, precisely between the slopes of Mount Merapi and Merbabu. The potential in this area includes local fruit and vegetable cultivation centers which are very popular with residents around them. In addition, local wisdom is still very much felt in every behavior and activity of the people who like to garden and cultivate in the fields. Some of the superior potential of the area developed is strawberries and vegetables. However, this potential requires innovation in science and technology because the yields are increasingly according to the results of cultivation techniques that are still wrong and susceptible to disease attacks. Another obstacle experienced by farmers is the magnitude of the influence of environmental and seasonal stresses on fruit and vegetable production so that the harvest is not optimal. One technique for improving the quality and resistance of strawberries is biotechnology through genetic improvement of genotypic properties and fruit phenotypes, multiplication of chromosome numbers (polyploidization), this has not been done by researchers in Indonesia. Therefore, it is necessary to provide assistance, direction, training and cooperative relations between farmers and academics, industry and government to improve the quality and quality of Indonesian crops through the development and application of Appropriate Technology and community empowerment. The aim of the Village Partners Development Program is to develop integrated agricultural cultivation innovations through increased production and greenculture in greenhouses, develop central edu park in tourist areas that provide bio-inventories of plants and animals, apply the benefits of organic farming in the cultivation of superior fruits and vegetables (broccoli , cauliflower, celery, tomatoes, chicory, mustard greens and cabbage), applying modified polyploidization technology through innovation in organic farming to the potential of regional natural resources and providing innovation through synergy and sustainability of sustainable education on the cultivation of strawberry and vegetable crops polyploidization. In addition, it is hoped that with this activity, trade business cooperatives can be formed to accommodate, market and sell agricultural, fishery and rural market livestock products (country markets), provide regular training and mentoring on cultivation innovations based on the empowerment of natural and human resources and provide skills and expertise in care and maintenance during sustainable strawberry cultivation. So that it is expected at the end of this activity to be able to build village independence through a network of industrial partnerships to strengthen the potential of a prosperous and prosperous agrotourism village

Keywords: Banyuroto, central edu park, genetics improvement

INTRODUCTION

Banyuroto Village, Sawangan Subdistrict, Magelang Regency, Central Java is included in the administrative area of Sawangan District, Magelang District, Central Java. This village has highlands with climate as in the highlands in general in the tropics. The stretch of land is highly land and mountainous land, because it coincides on the slope between Merapi and Merbabu Mountains. The potential of this area is an agricultural area that can be developed as an agrotourism area because it is closed to the Ketep Pass tourism complex and the Merapi Mountain Slope Tourism Park so that it becomes a quite attractive tourist

destination if developed agricultural superior tourism. In addition, the potential that can be developed as agro-tourism, another potential of the village of Banyuroto, Sawangan is from agricultural and plantation products that are able to produce superior potential using intercropping and overlapping farming systems. One of the agricultural products that can be used as a superior product is strawberries and vegetables.

The development of the cultivation of strawberries and vegetables in several regions, including in the Banyuroto Agro-tourism area, Banyuroto Village, Sawangan Subdistrict, Magelang Regency requires technology in innovation to gain superior quality and quantity of agricultural products. This is due to the decline in production in the area and the low quality of the harvest [1]. The decrease is inseparable from several factors that influence the character of the genetic quality of plants and vegetation growth, 1) slope, revegetation cannot be done on steep and unstable slopes; 2) soil texture, very smooth or rough soil surface can hinder plant growth; 3) nutrient content, a small nutrient content especially for essential nutrients will affect growth; 4) chemical substances, chemical substances such as extreme pH. High iron content or other chemical substances that can prevent growth, although some species are able to survive; 5) soil temperature, extreme soil temperature often associated with the color of the soil layer. Micro climatic conditions also affect the growth and development of vegetation (Polster, 1991; Handayani & Prawito, 2005).

Since 2012, Laboratory of Genetics and Breeding, Universitas Gadjah Mada had begun to identify and develop the phenotypic and genotypic characteristics of strawberry plants in Banyuroto Agro Tourism. The genotypic characters studied through ploidy identification with a cytogenetic approach were able to improve the character of the phenotype through the expression of the properties shown in the field as a result of environmental adaptation tests [2]. Not only that, in 2013 until now, Laboratory of Genetics and Breeding together with strawberry farmer groups in Banyuroto have succeeded in applying polyploidization technology which aims to multiply the number of chromosome sets so that plants that have phenotypic characters are obtained superior to controls. The advantages of this polyploidy plant are faster plant growth, faster stolon formation and nursery capacity. faster stolon formation and breeding ability, wider leaf area and stem diameter, thicker stems and longer roots, larger fruit yields and sweeter taste with a redder fruit color. The strawberry plant innovation is expected to be able to be followed by the cultivation of sustainable fruits and vegetables as optimal as possible so that the results obtained can improve the welfare of strawberry farmers in Banyuroto. Therefore, it is necessary to innovate sustainable strawberry and vegetable cultivation with a touch of polyploids technology based on economic, socio-cultural and environmental aspects in order to empower the community so as to be able to develop, develop and implement technological independence [3].

The research prospects of strawberries and vegetables through the characterization of genotypic properties and their phenotype are very large. This is because it can immediately find out genes that encode superior traits and then be used as a protocol to make GMO plants that can be sold with optimal quality and quantity. The superior characteristics encoded by genetic sequences in certain genes in plants can be inserted into microorganisms which later become the basis for the development of GMO plants because they only use superior genes to assemble plants that have high competitiveness so that they can strengthen the national innovation system [4].

In the cultivation of strawberries and vegetables, the selection of planting media and fertilizers based on organic matter is very important so that the need for increased consumption of strawberries and vegetables every year increases the quality and quantity of crop production by strengthening the character of the genotype. and the phenotype of

strawberry fruit. This character can only be obtained by discovering the characteristics and identities of the elders so that they can develop their agronomic characteristics. The qualitative nature of strawberries and vegetables in Indonesia is not only in the shape and color of fruit or flowers, but also needs to improve sweet taste, freshness and long shelf life and is resistant to disease attacks. Meanwhile, the quantitative nature of fruit and flowers is by genetic improvement of plants so that one plant can produce more crops in order to increase the country's foreign exchange. In the field of cell genetics, one way to do this genetic improvement is by polyploidization. Polyploidy is a condition that an individual has more than two genomes. Polyploid plants generally have more chromosome numbers than diploid plants so plants look more muscular, parts of the plant become larger (Suryo, 1995). The objectives were to develop integrated agricultural cultivation innovations through increased production and greenculture in greenhouses, develop central edu park in a tourist area that provides bio inventory of plants and animals, applying the benefits of organic farming in the cultivation of superior fruits and vegetables (broccoli, cauliflower, celery, tomatoes, chicory, mustard greens and cabbage), applying modified polyploidization technology through organic farming innovation to the potential of regional natural resources and providing innovation through the synergy and sustainability of sustainable education on the cultivation of strawberry and vegetable crops from polyploidization and provide technological advantages in open land in agro-tourism in the form of education and tourism.

MATERIALS AND METHOD

The performance measures of agri-food supply chains [5] focus on efficiency, flexibility, responsiveness, and food quality. Food quality has been discussed as above; the other three indicators emphasize agri-food production processes that rely on various strategies to maintain profitability in a local or regional market-oriented agricultural economy. Although the concept of sustainability has been considered for inclusion into the traditional agri-food supply chain (such as in developing a sustainable food supply chain) [6], the agri-food supply chain is still mainly focused on improving manufacturing and distribution systems and developing procurement systems based on more sustainable forms of agriculture. In short, a traditional agri-food supply chain is most concerned with the management of operational processes, logistical efficiencies, and production sustainability (“green production”).

On-farm enterprises include small to large family farms, as well as farmers’ organizations, co-operatives, and private enterprises. They play important roles in agricultural production and near-farm basic processing. Farms can become interesting places for rural development projects, such as those for travel, education, leisure, and adventure. A farm or the countryside can also be promoted by place branding as a desirable destination [7] for tourism purposes. According to the previously mentioned reasons, agri-food or the agricultural gastronomy aspect within tourism is connected in the Western world to sustainable development in rural areas, and its significant opportunities have been discussed by the European Economic and Social Committee [8]. However, this concept is less discussed in the Asia-Pacific region, especially when considering local smallholder farmers. Therefore, this paper raises the argument that agri-food tourism can be regarded as the same “wicked problem” in the Asian region (Figure 1).

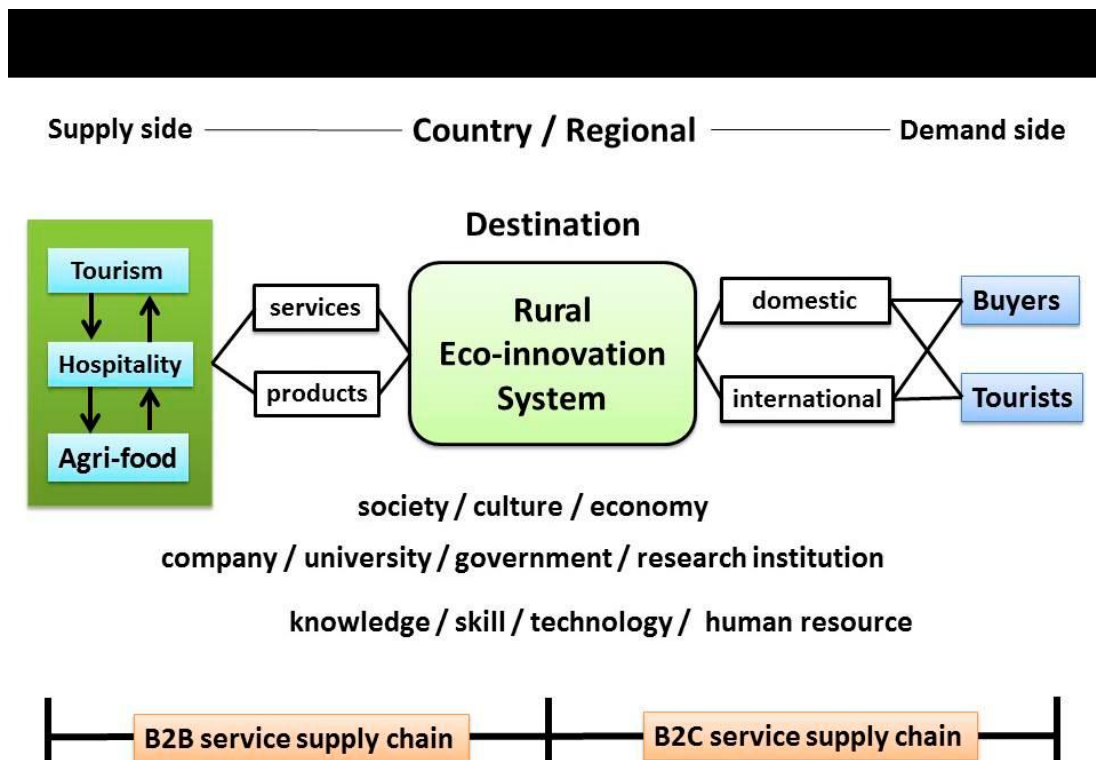


Figure 1. A proposed conceptual framework for agri-food tourism as eco-innovation strategy [9]

The proposed conceptual framework is designed for understanding that agri-food tourism can become an eco-innovation strategy in the Asia-Pacific context. Detailed explanations are divided into three parts, including demand side, supply side, and destination.

RESULT AND METHOD

1. Development of central edu park in a tourist area that provides bio inventory of plants and animals

The development of the central edu park was currently still running by utilizing one of the strawberry cultivation fields developed with the polyploidation technique. This activity was supported by the ability of the village to optimize youth organizations as Human Resources that will manage and continue the activities so that they remain sustainable. In addition, to the main commodities namely strawberries, central edu park also developed other superior commodities, namely vegetables and some fruits. Several supporting books have also begun to be printed as a means of supporting marketing and science.

2. Application of organic farming in the cultivation of superior fruits and vegetables (broccoli, cauliflower, celery, tomatoes, chicory, mustard greens and cabbage)

Technical training on how to induce vegetable seedlings was carried out on vegetables with strategic potential in Banyuroto village, namely tomatoes, cauliflower, celery and cabbage. This training is carried out by inducing the tip of the 4 plants with colchicine carefully. Soaking is done by first cleaning the root tip of the plant and doing it for 2 x 24 hours in a 0.05% colchicine concentration. After all the induced seeds are then planted in the prepared cultivation area, an induction process was carried out every day at the end of the plant's apical shoots with the aim of connecting and optimizing plant growth so that it can work well (Figure 2)



Figure 2. Organic farming in the cultivation of strawberries and vegetables resulting from poliploid induction

3. Providing innovation through the synergy and sustainability of sustainable education on the cultivation of strawberry and vegetable crops from polyploidization
Continuous innovation that involves farmers and youth groups aims to provide insight into the knowledge and technology that has been increased to industrial potential. This technology is expected to bring the name Banyuroto to be better known and worldwide.



Figure 4. Continuous strawberry cultivation training

4. Providing skills and expertise about care and maintenance during sustainable strawberry cultivation
This activity was carried out on the farmland of Banyuroto Village covering an area of approximately 5,000m² for strawberry cultivation and an area of 1,000m² for vegetable

cultivation. The skills and expertise of strawberry and vegetable cultivation include starting from how to choose good seeds, planting seeds to polyploid induction. When the plants have started to grow, periodic assistance is carried out for how the mechanism of spraying polyploid agents and plant resistance.



Picture 5. Cultivating strawberries and vegetables on the farm in the Banyuroto village

5. Building village independence through a network of industrial partnerships to strengthen the potential of a civil and prosperous agrotourism village

This initiative was mobilized with the aim of realizing Banyuroto village as a tourism village equipped with various facilities and panoramas of its natural beauty. Merbabu National Park was made as one of the strong partners to realize this because of its very close proximity to the location of the Banyuroto Tourism village. The initiation of this collaboration will be realized with the existence of an MoU and an agreement on cooperation in the field of tourism.

CONCLUSIONS

1. Optimization of natural resource development activities in the village of Banyuroto, Sawangan Subdistrict, Magelang Regency is able to provide improvements in the sector of superior fruit and vegetable commodities
2. Empowerment of the strategic potential of the Banyuroto village is expected to improve the welfare of the community nationally
3. Excellent products can be used as an icon of the area and known to the wider community.

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