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Development of *Nyegara-Gunung* Agrotourism on Environmentally Base

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ABSTRACT. Bali often has to face difficult choices, whether developing tourism at the expense of agriculture and the environment or keeping agriculture and environment on the limited tourism sector. In accordance with the goals of SDGs 2030, seemed better to develop *Nyegara-Gunung* agrotourism, with aims to provide agricultural value-added in the broadest sense and environmentally sound, as well as to develop eco-agrotourism through marketing tour packages of the activities, products, and landscapes of the agricultural cultivation. The concept was an integrating route of agricultural tourism destinations with cultivation characteristics in mountainous areas (*Gunung*), continuing to cultivation in moderate plains, continuing to cultivation in lowland until ending in coastal and marine cultivation areas (*Nyegara*). The aims of this study: (1) to map agricultural potential of the farming community in each *Nyegara-Gun*ung agrotourism destination; (2) to analyze biophysical characters for enhancing farming in each destination; and (3) to formulate the development model for *Nyegara-Gunung* agrotourism. The result as follows. *Nyegara-Gunung* agrotourism destination in west Buleleng: cultivation for Strawberries and upland vegetables and ecotourism Buyan & Tamblingan lake in upland area of Pancasari village; organic Balinese rice farming and tropical fruit in moderate plains of Sawan-Sudaji villages; organic Black Wine agribusiness in lowland of Tangguwisia village; and Grouper hatchery and enlargement in marine cages in Gerokgak district. *Nyegare-Gunung* agrotourism applied for good association among agricultural activities, environmental concerns and human interests through practical cultivation and ranching as well as *subak-desa adat*-coastal communities involvement. Organic resources amalgamation (natural or artificial) should be applied in the cultivation, due to enriching biodiversity. Finally the agrotourism development must foster the three basic principles of sustainable development: (i) conserving natural areas; (ii) educating visitors; and (iii) benefiting the local population.

INTRODUCTION

Bali is a favorite tourist destination not only in Indonesia, but throughout the world. As a tourist destination, Bali consistently places the tourism sector as the mainstay sector. The development of the tourism industry in Bali generally applies the concept of Cultural Tourism, which implicitly includes the mission to refine Balinese culture in every development activity. On one hand, tourism has become one of the industries that have a major impact on Bali's economic growth. On the other hand, the rapid development of tourism in Bali has brought tremendous breaking energy which has caused degradation of the natural /agricultural/aquatic environment quality and affects structural changes to Balinese society and culture significantly. Bali often ought to face difficult choices, whether developing tourism at the expense of agriculture and the environment or maintaining agriculture and environment on the limited tourism development. In accordance with the goals of SDGs 2030, that development must always be oriented towards a balance between economic development, social improvement and environmental preservation. The best resolution is rather developing tourism sector without degrading agriculture and environment [3].

One alternative that is in this combination is agrotourism which means traveling to agricultural areas. Agriculture here means in a broad sense which includes people's agriculture, plantations, forestry, animal husbandry and fisheries. Not only seen from the results, but related more broadly to the ecosystem and even the environment in general.

In the research of [6] concerning the contribution of tourism to the agricultural sector in Bali, it was found that there was a regional leakage because most of the agricultural production was imported from outside Bali. Balinese agricultural products did not host hotels and restaurants in Bali. Meanwhile, almost 70% of investment opportunities in Bali were in the agricultural sector and post-harvest products [7].

The research of [2] recommended that to increase the quantity of Balinese agricultural products that met the quality standards of international chain hotels and restaurants, it was necessary to take incentive measures through the physical revitalization of agriculture (organic-based product cultivation and processing) as well as its metaphysical side (tradition-religion-aspiration-culture) farming community and its *subak* institution. The implication of these, it was necessary to build an integrated agricultural revitalization with the aim of tourism development. The intended integration was that the processes and outputs of agricultural activities became

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inputs for tourism activities, while the outcomes of tourism could trickle down to farmers and became capital strengthening for farmers and their *subak* institution. One of this integrations was the construction of *Nyegara-Gunung* agrotourism path in western part of Buleleng regency along with a clear maintenance and development program.

The development of agrotourism in Bali is believed to be able to build an integrated and coordinated system of activities to develop the tourism sector as well as the agricultural sector while maintaining environmental sustainability and improving the welfare of farmers. Attempt to develop Bali's natural resources that have potential in the field of plant cultivation in paddy fields with various unique tradition-religion-aspiration- culture (TRAC) which attach to its *subak* institutions. The same is applied to activities in the people's livestock and fishery sectors. The contained potential must be seen in terms of the natural environment, geographical location, types of agricultural products or commodities produced, as well as facilities and infrastructure [5]. The integration of all these potentials will be able to create a very attractive agrotourism area (lane) which can be sold in the form of tour packages to foreign countries.

The strong and unique potential in several destinations for agricultural activities in northern Bali, especially in the western part of Buleleng regency, could be integrated with high opportunities for tourism development into a *Nyegara-Gunung* agrotourism package. The concept was an integrating route of agricultural tourism destinations with cultivation characteristics in mountain areas (*Gunung*), continuing to cultivation in moderate plains, continuing to cultivation in lowland, until ending in coastal and marine cultivation areas (*Nyegara*). In the development of this agrotourism, not only agricultural tourism objects were prepared, but also the revitalization of physical and metaphysical activities on agrarian culture of rural communities to be able to capture the added value provided by these agrotourism activities.

Tourism investment in Bali was very dominantly concentrated in the southern part of Bali (Badung, Denpasar and Gianyar). Tourism activities in these areas were too much oriented towards the capital-based tourism. On the other hand, efforts to foster, develop, preserve, and revitalize traditions-religion-aspirations-culture in many villages had been neglected, even though the tourism sector had clearly taken advantage of TRAC assets which was rooted in two social institutions *desa adat* (customary community in the village) and *subak* (community of farmers who receive their irrigation water from one particular source or dam) [2].

Moreover, the development of the tourism sector often sacrificed the agricultural sector, such as the conversion of agricultural land, competition in water use between the need for hotels and restaurants and the need for agricultural irrigation, the rapid movement of agricultural human resources from villages to cities and to locations of capital-based tourism development, and so on that increasingly threaten the agrarian culture and *subak* in Bali to became bankrupt and memorable.

Through the development of the *Nyegara-Gunung* agrotourism path, it was expected to provide more equitable benefits to all stakeholders: farmers with *subak* institutions and local traditional villages, surrounding communities, investors, and travel agencies. The development of the *Nyegara-Gunung* agrotourism path would improve environmental conservation. Conservation values that were emphasized were on the balance of the ecosystem. This agrotourism route was expected to have existence effect values that were useful for the environment, because its existence affects to the weather and the surrounding climate. Improving: aesthetic value and natural beauty, recreational value, as well as scientific activities and scientific development. The problem then how to develop the *Nyegara-Gunung* agrotourism in west part of Buleleng regency? Therefore The aims of this study were:

- to map agricultural potential of the farming community in each *Nyegara-Gun*ung agrotourism destination;
- to analyze biophysical and social-economic characters to support farming enhancement in each destination; and
- to formulate the development model for *Nyegara-Gunung* agrotourism

METHODOLOGY

The research locations were purposively determined in Pancasari village (mountain and up land areas), Sawan-Sudaji villages (moderate plains), Tangguwisia village (lowlands) and Gerokgak (coastal and marin areas) to create a *Nyegara-Gunung* agrotourism path in west part of Buleleng regency. In addition, to collect data and information on various matters supporting the research objectives, it was carried out at the relevant agencies. Surveys and focus group discussions (FGD) were carried out and to obtain: mapping of agricultural potential, explanation of socio-economic support of the communities and biophysical characteristics of the development area in the destinations of the *Nyegare-Gunung* agrotourism path.

Especially for destinations in Sawan-Sudaji villages, technology applications for organic-based rice farming were carried out with a mentoring pattern of 8 business units (4 ha), accompanied by lectures and discussions

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about efforts to improve: mindset (*parhyangan*), social system (*pawongan*) and artifacts (*palemahan*) in *subak*. This was to accelerate *Subak*'s competitiveness in the development of organic-based agricultural commodities and community-based tourism. All of these activities were aimed to formulate a model for the development of the *Nyegara-Gunung* agrotourism.

RESULTS AND DISCUSSION

The geographical map of the four (4) destinations along with a description of the characteristics of each destination of *Nyegara-Gunung* agrotourism can be seen in Figure 1. The distance: from Denpasar city to Pancasari is 60 km, from Pancasari to Sudaji is 40 km, from Sudaji to Tangguwisia is 36 km and from Tangguwisia to Sumberkima is 35 km.

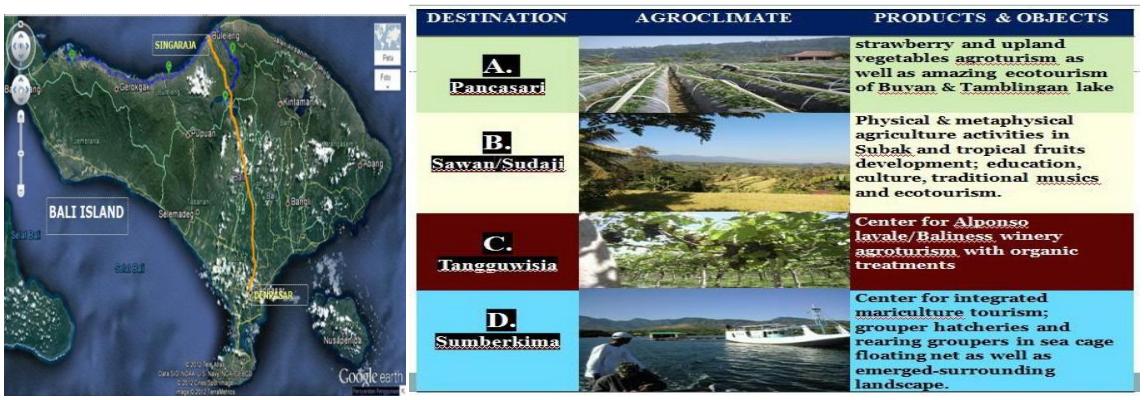

FIGURE 1. The location map of 4 destinations in *Nyegara-Gunung* agrotourism along with a description of each destination

The Vision and Mission of Nyegara-Gunung Agrotourism

The vision of *Nyegare-Gunung* agrotourism was: to be the most popular and beneficial agrotourism in the world which was able to complete the visitor experience, comfort & delight and to improve people's prosperity in *subak*s and in coastal communities. The mission was: to enhance Sustainable Tourism, to revitalize Community-Based Tourism, to develop Education Agriculture Tourism as well as Food Tourism in the four potential center destinations Pancasari, Sawan-Sudaji, Tangguwisia and Gerokgak.

The vision & mission are supported by *Nyegare-Gunung* cultivation. The meaning of *Nyegare-Gunung* cultivation: the all life activities carried out on land/*Gunung* areas will have an impact on the sea/*Segare* areas; so also what is done in the sea will have an impact to people on land. So that *Segare* and *Gunung* cultivation management must be integrated which prioritizes health and sustainability.

Marinculture Potensial of Gerokgak for Nyegara-Gunung Agrotourism

The main product of marinculture in Gerokgak district is Grouper. Grouper cultivation include three stages, namely: (1) hatchery that produces juveniles of grouper with a size of 3.0 - 5.0 cm; (2) nursery that produce grouper yuwana fishes with a size 6.0-10.0 cm; and (3) ranching fishes in floating net cages /KJA in the sea that produce grouper consumption size. Each of the three stages of production can be turned into an independent business (industry), but the most potential hatchery and nursery activities and technology can be utilized by the coastal communities in Gerokgak district in an effort to increase family income. Hatchery and fishes breeding are carried out en masse along coastal waters in the villages of Gerokgak, Sanggalangit, Musi, Penyabangan and Banyu Poh, while fish ranching activities in KJA are concentrated in the waters of Sumberkima Bay.

The Cluster analysis at the site level is used to determine the five main types of coral communities that are related to wave level, current - upwelling, substrate type and geographic location. The coastal area of Gerokgak district is included in the relatively sheltered coral community where the waves are smashed, currents - upwelling, substrate type and geographic location are ideal for aquaculture (marinculture activities) [4].

The potential area of the coastal in Gerokgak district for sea fish hatchery cultivation is 120 hectares, but only 30 hectares have been utilized. This hatchery area have altitude of 0-10 m above sea level, the beach is not too plane with not muddy seabed condition. The coastal waters are clean and not muddy, with sea water salinity of 32-34 ppt. Seawater can be pumped for a minimum of 20 hours per day. Freshwater sources are available with a maximum salinity of 5 ppt through the Gerokgak Regional Consumtion Water Company. All hatchery business locations have easy accessibility, and are affordable by car. The location designation is in accordance with the Regional Spatial Planning (RUTRW). All of these natural resource characteristics are ideal for developing marine fish hatchery.

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There are 72 venture grouper hatcheries along the coast of Gerokgak with a total area of 1180 larvae tanks. Besides larvae tanks, a grouper hatchery also needs plankton tanks and rotifer tanks as tanks for natural food production for grouper larvaes. The overall grouper hatchery firms absorb labor force of about 500 people remained and 700 seasonal workers. However, at certain times drought can decrease the quality of seawater in the area around the inlet and outlet which result in the death of natural foods (plankton, rotifer) larvae and fishes en masse. Therefore it is very important to check the quality of the physical, chemical and biological of the seawater around the inlet and outlet of the hatcheries.

Some species of grouper fish that have been successful and commonly produced by the local farmers in Gerokgak, namely: Tiger grouper (*Epinephelus fuscoguttatus*), Rat grouper (*Cromileptes altivelis*). In line with development in spawning and grouper hatchery technology, the backyard hatchery community in Gerokgak district are able to produce Cantang hybrid grouper seeds, the crossing product between Tiger grouper (*Ephinepelus fuscoguttatus*, Forsskal 1775) and Naga / Kertang grouper (*Ephinepelus lanceolatus*, Bloch, 1790). The supporting geographical environmental factors as well as natural and human factors in cultivating grouper in the coast and sea of Gerokgak district, which is a single entity, have been inducng the quality or characteristics of the Cantang hybrid grouper produced.

The potential sea waters of Sumberkima bay for ranching groupers in floating net cage/KJA is 1480 ha, but yet there are only 27 KJA firms. Their total fishponds (3x3 m) are 3864 units and apply only about 100 ha waters of Sumberkima bay (6,8%). On average for running 100 fishponds employs 30 workers, so the whole sea cage farms in Sumberkima bay absorb about 1160 workers. The maximum production for the whole grouper KJA in Sumberkima bay is about 483 ton per cycle production.

In focus group discussion with the coastal communities in Gerokgak district, it was found that socio-economic support from the coastal community of Gerokgak was as follows. The community was very open to the development of marine aquaculture tourism, but it must really be for the welfare of the small holders. So that local community participation was accommodated in the concept of KJA cultivation tourism so that it could bring benefits to small holders (fishermen). In order to turn on the KJA belonging to the local group should be provided the necessary production facilities, so that it could be used as a "display" and model for tourists. In order to build a simple dock facility as soon as possible and a security guard post so as to improve accessibility and security in the KJA cultivation area in Sumberkima. The grouper hatchery activity which was a biological application of the food chain in the growing larvaes to be juveniles/seeds and the ranching groupers in KJA had attraction as an object for education tourism in *Nyegara-Gunung* agrotourism.

Agricultural and Subak Potensial of Sawan-Sudaji for Nyegara-Gunung Agrotourism

Buleleng Regency is one area in Bali that has high potential for paddy farming with well known product of rice: Sudaji Rice. This Rice has a unique taste with bright white color and a very high demand at high price. Unfortunately, green revolution encouraged farmer to use chemical intake intensively that resulted in low quality of Sudaji rice [8]. In the other hand, tourist more interested in organic product. So it need many efforts to restore the image of Sudaji rice e.g reintroducing the application of organic based rice farming technologies and local varieties of Sudaji rice: *Cicih Gondrong*.

Location of Sudaji village is 16 km from the Capital regency (Singaraja); and 88 km from the capital-city of Bali (Denpasar). This Village is hilly topography with altitude around 450-560 meters above the sea. The level of rainfall is 2000 mm / year, temperatures between 25- 28^{o} C. The characteristic of agriculture land in this village is very fertile with abundant of irrigation water, that it is very supportive both for the development of rice crops and tropical fruits.

The agricultural activities in Sawan-Sudaji are not only in physical study but also in metaphysical. The embodiment of metaphysical agriculture is as follows. Agricultural ritual and customary ceremonies. There are two biggest ritual: *Nyapah* which takes place in center village temple (*Bale Agung*) once in every year; and *Usaba* in a hill temple of *subak* (*Bedugul*). These two rituals are very facilitated by *desa adat*. Various medium and small rituals which are arranged by members (*krama*) of *subak* in each their farm fields. Metaphysical activities are inspired by local wisdom such as *Ahimsa, Tatwamasi, and Tri Hitha Karana*. Philosophical Teachings are required to always maintain balance and fertility *Rwa Bhineda* (two things that seem contradictory that make life happens). In this case the pests & natural enemies in agro eco systems are manifestation of the *Rwa Bhineda* should always be kept in balance. The Way is through the renewal of the organic-based farming.

Products and Objects in Sawan-Sudaji villages for *Nyegara-Gunung* agrotourism: Health rice (Bali cultivar rice & excellent new variety rice); Tropical fruits; Bull contest; Livestocks; Traditional ceremonies to traditional craftsmen in action; physical & metaphysical agriculture activities in *subaks*; Sekumpul Waterfall adventure; Local genius education, Traditional musics (Bamboo & Metal) and Eco-tracking.

The cost and return of the Demplot organic based *Cicih Gondrong* rice farming (per hectare) was as follows. The price of Cicih Gondrong Rice in the normal market was Rp 15,000/kg. Average production: 3780 kg;

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Average production cost: Rp 21,499,625; Average revenue: Rp 56,700,000; Average income per cycle production : Rp 35,200,375; Average monthly income: Rp 7,040,075.

The Wine Potensial in Tangguwisia as Nyegara-Gunung Agrotourism

The location of Tangguwisia Village is 22 km from the regency capital (Singaraja); and 99 km from the capital city of Bali (Denpasar). The topography of the village is lowland with an altitude of 0-17 m above sea level. This area has a rather dry climate with 1650 mm/year of rainfall, temperatures between 28-30^{o} C. The area of Wine plantations in Tanguwisia village is 46 hectares, with an average productivity of 14800 kg/ha (sugar content 13.22% w/w). The price of Wine production is Rp 3000 – 6500 per kg. The Wine processing industry already exists. The potential for Black Wine farming and *subak* institutions in Tangguwisia village is still very good, however, improvements in production techniques (progressive treatment) with organic methods with a touch of microbiofarming technology and biotechnology are required to increase the production and quality of Wine (high sugar content and ecolabeling).

One thing that reqiured to be observed and a solution to the problem is the increasing trend of conversion of *subak* rice fields in the northern coastal area of Buleleng regency (including in Tangguwisia village). The case is occurred as a result of increasing demand for land for hotels, restaurants, housing/developers, foreign villas and industry. Therefore, various efforts must be made to strengthen the factors in *subak*, namely: *awig-awig* (customary rules), *sangkepan* (customary gathering), leadership/*kelian*, *subak* economic institutional units, and *subak* authorities to strengthen *subak* as a guard in preserving culture and the environment in Buleleng.

The Up Land Potensial in Pancasari as Nyegara-Gunung Agrotourism

The location of Pancasri village is 24 km from the regency capital (Singaraja); and 45 km from the capital city of Bali (Denpasar). The topography of the village is mountainous with an altitude of 1000 – 1100 m above sea level. This area has a cool/wet climate with rainfall of 2500 mm/year, temperatures between 23-25^{o}C. Agricultural potential: Strawberries and highland vegetables.

From the area of Pancasari village 1280 ha: 366 ha is agricultural/plantation land and 883 ha is State forest. Agricultural land is almost entirely planted with upland vegetables and other horticultures. The area of planting and production of Strawberries, Cabbage, Carrots and Petsai dominated horticultural commodities in Pancasari village.

The horticultural cultivation techniques is still semi-organic, where manure are the main fertilizers in cultivation activities. Pests and diseases control is carried out in an integrated and controlled manner. Currently, there is no need for the horticultural product processing industry because all strawberry and other vegetable production is absorbed in the market at a fairly profitable price (Strawberries were priced at Rp 25000 – 30000 per kg). Production marketing: local, Denpasar, Badung and Buleleng.

Formulation Model for Nyegara-Gunung Agrotourism

The model for development of *Nyegara-Gunung* agrotourism can be seen in Figure 2. The basic premise of eco-agrotourism is simple, and its potential extends well beyond tropical systems. Tourists pay to experience nature in a manner that respects the local culture and environment. The outcomes of local economy and culture benefit, are generated by creating an enduring incentive for the locals to maintain the supply of tourists via natural resource conservation [1]. Therefore, The *Nyegara-Gunung* agrotourism development should adhere to three basic principles of sustainable development: (i) conserving natural areas; (ii) educating visitors; and (iii) benefiting the local population.

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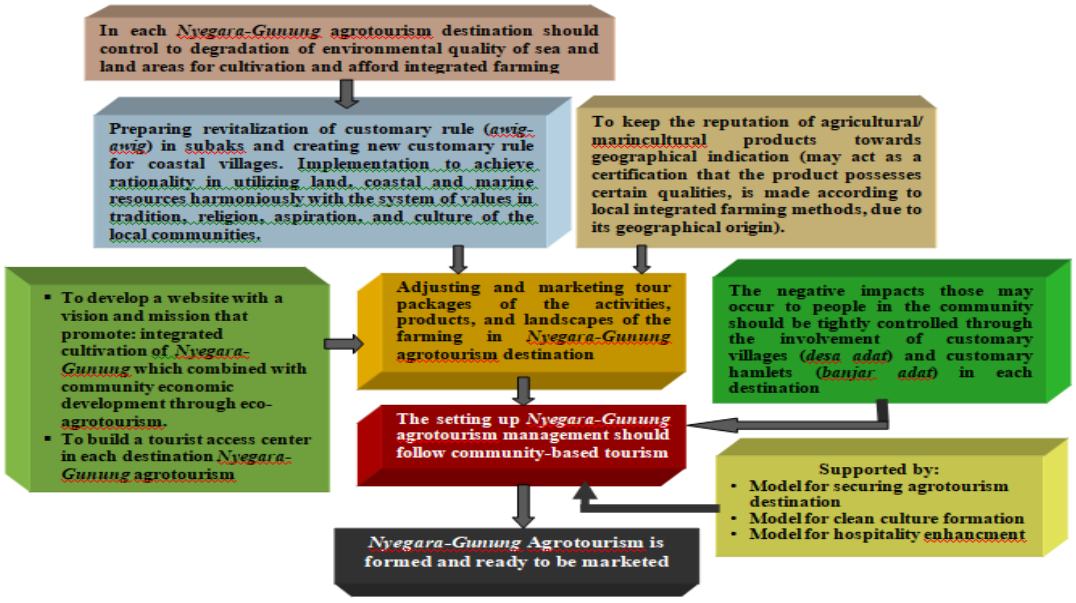

FIGURE 2: The model for development of *Nyegara-Gunung* agrotourism in the western part of Buleleng regency

CONCLUSION

Nyegara-Gunung agrotourism destination included: cultivation for Strawberries and upland vegetables and ecotourism Buyan & Tamblingan lake in upland area in Pancasari village; organic Balinese rice farming and tropical fruits in moderate plains of Sawan-Sudaji villages; organic Black Wine agribusiness in lowland of Tangguwisia village; and Grouper hatchery and enlargement in marine cages in Gerokgak district. *Nyegare-Gunung* agrotourism applied for good association among agricultural activities, environmental concerns and human interests through practical cultivation and ranching as well as *subak*-desa adat-coastal communities involvement. Organic resources amalgamation (natural or artificial) should be applied in the cultivation, due to enriching biodiversity. Finally the agrotourism development must foster the three basic principles of sustainable development: (i) conserving natural areas; (ii) educating visitors; and (iii) benefiting the local population.

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