

# PROGRAM AND ABSTRACT BOOK OF THE 5<sup>th</sup> ASIAN CONFERENCE ON PRECISION AGRICULTURE

**JUNE 25-28, 2013**

Hotel Ocean Suites  
Jeju Island, Republic of Korea

**Organized by**



Korean Society of Precision Agriculture



Korean Society for Agricultural Machinery



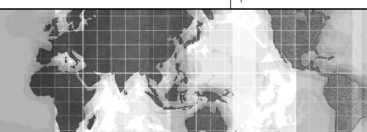
Rural Development Administration



Center for IT Convergence Agricultural Machinery



Foundation of Agricultural Technology Commercialization and Transfer



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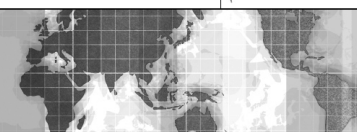
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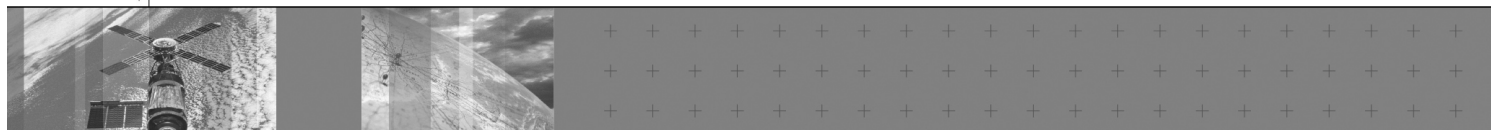
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**USING OF SMALL SCALE AGRICULTURE LAND FOR AGRO-TOURISM  
DESTINATION IN BALI PROVINCE**

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**Abstract:** The land ownership of farmer in Bali Province is very limited, only 0.3 ha per farmer. The contribution of agriculture sector for gross regional domestic product (GRDP) is decreasing. Other side, Bali is well known as world tourism destination, and the contribution tourism sector to GRDP Bali is increasingly. Both conditions have big opportunity to be combining so that this sector can give optimal benefit. It is needs the alternative for effective land managing system so that give optimal benefit for farmer welfare. Some of agriculture lands, especially placed on core tourism area, more potential is developed and manage as agro-tourism destination. Currently, the developing of Bali tourism gives attention to agro-tourism as the tourism attraction alternative. The emerging of some agro-tourism is spread at some destination tourism area. This condition will cause of agro-tourism competition more tight. Based on these phenomena, the research was conducted to explain existing agro-tourism profile and to formulate the strategic models of sustainable agro-tourism development basis on community empowerment. The research is focus on agro-tourism in Bali Province. Agro-tourism which selected as a sample, decide by snow-bowling method. Data collection method is using questionnaire, in-depth interview, and focus group discussion. There are 5 type of classification or typology of agro-tourism profile in Bali, based on commodity potency, i.e.: (1) Agro-tourism based food crop; (2) Agro-tourism based plantation; (3) Agro-tourism based livestock; (4) Agro-tourism based fisheries; and (5) Integrated agro-tourism. Based on the amount of agro-tourism destination in a region, the distribution it's concentrated in 3 regency, i.e.: Gianyar, Bangli, and Tabanan Regency. This regency are have good potency of agriculture and crossing with core tourism destination. The combination potency of agriculture and tourism will support the growth of agro-tourism relative faster. There is some grand strategy which recommended. The outcome of implementation strategy hope that creating the alternative of tourism destination with increasing value added of agriculture commodity, and tourism activity which can give benefit for ecological conservation, cultural revitalization, and increasing of economic or welfare for farmer as individual or groups.

**Key Words:** Agro-tourism, Added Value, Community Empowerment, Sustainability

**INTRODUCTION**

Tourism sector's contribution to the Bali regional revenue from year to year increase to outperform other sectors. However, the Bali tourism development policies that tend to lead to

large scale tourism and capital intensive endurance feared would threaten local culture and environment. Construction of various types of large-scale tourism facilities not only cause the conversion of agricultural land in less controlled, as well as threatening the existence of one of the subak as an agricultural heritage that is valuable (Pujaastawa, 2003).

Tourists in large numbers and are concentrated in certain places can reduce the quality of people's lives, which in turn would likely eliminate the attractiveness of the area. The beauty of the natural environment suffers when the number and quality of tourist behavior cannot be controlled effectively Suwanto (2001). In order to develop and establish the image of Bali tourism needs to be done: (1) various types of business diversification, product, and attractions in accordance with the development of world tourism, alternative tourism that is environmentally sound, (2) search solution to integrate three priority development sectors (agriculture, tourism and small industry) of Bali, (3) increase the welfare of farmers so that agriculture can support the sustainable tourism sector, (4) distribution of the economic benefits of greater tourism to the general public directly engaged in other sectors related to tourism; (5) planning and development of a new tourist attraction destination for travelers deployment, quality control environment, and creating new growth centers (Satriawan, 2005).

In an effort to anticipate and cope with the above issues, policy development of tourism in Bali recently also gives attention to the development of agro-tourism as an alternative tourist attraction. Agro-tourism is a form of tourism that utilizes agro business as a tourist attraction with a view to expanding the knowledge, experience, leisure and business relations in the field of agro. Guntoro (1995) states that ecotourism is a form of tourism that object in the form of farming (agro), along with the activities related to the business, including research and exploration activities of agricultural resources, farm equipment and agricultural products. More specifically Yoeti (2000) states that agro-tourism is a special type of tourism makes agricultural commodities, livestock, farm as an attraction for tourists. For the purpose of this research, agro-tourism is a form of tourism that utilizes agricultural activities from upstream to downstream including facility related as an object and tourist attraction to meet goal of tourism.

Values and principles embodied in the concept of agro-tourism covers five main aspects, namely: agriculture, conservation, education, community involvement and economic (Ahmadjayadi 2001). Residents should get to know and appreciate about agro-biodiversity as a valuable and useful protection, to ensure that ecotourism also helps preserve the diversity of biological resources (Kasperek 2004).

Management of tourism potential, particularly ecotourism will be more emphasis and responsibility of local community participation. It is an important effort towards a community-based resource management. Community as one of the stakeholders should be involved in the management of the various resources of the region / territory them. Local communities have the rights to interpret, preserve and manage their resources (Ascherson 2000). Faulkner (2000) suggested the concept he calls "Democratic Archaeology from Below", which basically emphasizes community participation in all types and levels of employment. Local knowledge and traditional institutions that developed in the community concerned in the management of cultural resources must be maintained and be involved. Government and the relevant authorities as a facilitator in the management of cultural resources is concerned.

Kodhyat (1997) states that tourism should be perceived as an instrument for improving the quality of human relationships, the quality of life of local residents, and environmental quality. Tourism development needs to be made as part of a national sustainable development, and performed in an integrated unity with other development sectors.

Building on this phenomenon, this study will try to explain existing agro-tourism profile and to formulate the strategic models of sustainable agro-tourism development basis on community empowerment in Bali Province. Through this model of agro-tourism development is expected to provide benefits to the ecological, cultural revitalization, and economic development in a more equitable and sustainable.

## **METHODOLOGY**

The study was conducted in the province of Bali with a research focus on agro-tourism whose existence spread across a number of regency in Bali. Agro-tourism used as the sample was determined by the method snowbowling. Search halted until the sample no longer obtain information other agro-tourism known from previous reference. Based on the above method, 42 samples agro-tourism are obtained scattered in Gianyar regency (9), Bangli (10), Karangasem (3), Tabanan (8), Badung (3), and Denpasar (9). Method of data collection was conducted using questionnaires, in-depth interviews, field observations, and focus group discussions. Identify internal and external factors as well as the formulation of strategies using SWOT (Strengths-Weaknesses-Opportunities-Threats) Analysis Technique (Rangkuti, 2000; David, 2002).

## **RESULTS & DISCUSSION**

### **CLASSIFICATION OF AGROTOURISM PROFILE**

Agro-tourism is basically a type of tourism that utilizes agro business as a tourist attraction with a view to expanding the knowledge, experience, leisure and business relations in agriculture. Building on the concept of agro-tourism as described above, and then the agro-tourism in Bali can be classified based on the types of commodities that became its appeal, as follows:

#### Agro-tourism Based Food Crop

Agro-tourism based on food crop commodity, currently only agribusiness in wet land with paddy commodity, which can manage as agro-tourism, called by Subak Agro-tourism. Although there are a lot of Subak in every regency in Bali Province, but Subak Agro-tourism only developing in Jatiluwih Village and Wongaya Gede Village, Penebel District, Tabanan Regency. Jatiluwih Rice Terrace is one of the world heritage was announced in July 2012 as a site world heritage at the annual plenary session of UNESCO.

The attractiveness of Subak Agro-tourism is ideofact aspect (value system), sociofact (social system), and artifact (infrastructure). The cultivating traditional system in Bali Subak is a one famous rice farming system in the world. Some tourism activity in Subak Agro-tourism is sightseeing, trekking, cycling, ATV riding, *Matekap* (traditional land processing), cultivating paddy seed, culinary with local agricultural product. Management system of Agro-tourism in Jatiluwih and Wongaya Gede is doing by individual firm and collaboration with local subak organization. By with this management system, the farmers as a member of subak organization have added revenue besides yield product from the land production.

#### Agro-tourism Based Plantation

Agro-tourism based plantation can be divided into two kinds, namely agro-tourism plantation with a single or similar crop (monoculture) and plant mixture (polyculture). Agro-tourism Based

Plantation Monoculture based on the types of commodities, in Bali can be classified as follows: Agro-Based Plantation Flowers, Agro-Based Plantation Strawberry, Agro-Based Plantation Salacca, Agro-Based Plantation Coffee.

**Agro-Based Plantation Flowers.** The types of plants that developed in the province of Bali is orchids, carnations, roses, jasmine, angora, chrysanthemum, gladiolus, tuberose, palm, ephorbia, soft-shelled, adenium, antorium, ferns and others. Flower plantation business as agro-tourism attraction are found in the northern region of Badung, precisely in Plaga Village, District Petang, Badung regency with plant species Hydrangea (*Hydrangea macrophylla*). Hydrangea plants in Bali are well known as a thousand broken flower are cultivated as cut flowers for ceremonies facilities / religion especially offerings for Hindus (Sumerta et. al., 2005).

**Agro-Based Plantation Strawberry.** Agro-based strawberry farm located in Region Bedugul (Tabanan), Pancasari (Buleleng), and Plaga (Badung) which is an area of highlands and mountains. In order to do excursions in the area of agro-based plantation strawberry, tourists can perform a number of activities as follows: relaxation and enjoy the panoramic beauty of the strawberry plantations strawberry while enjoying the fresh fruit and the cool mountain air and fresh, trekking or walking around the plantation area, participating directly in business activities strawberry crop cultivation, such as seeding, planting, fertilizing, maintenance, and harvesting, strawberry fruit processing into refined products such as juice, syrup, jam, or compote strawberry, shopping (fruit, seeds strawberry, and some types of processed products as souvenir).

**Agro-Based Plantation Salacca.** As well as a tourist destination, Bali is also renowned as one of the central production of fruits in Indonesia. Sibetan village and Perangsari (Karangasem), which is about 85 Km from Denpasar, in this village there are two growing areas of Salacca, which by the Karangasem regency government has developed into agro-tourism attraction. The types of activities that can be done by tourists in order to make a visit in the area of agro-tourism in the village Salacca Sibetan and Perangsari include: trekking or walk down a plantation area of bark; cycling on salacca plantation along with riding a bike; pick their own fruits desired; demonstration also tried processing fruits processed into various products such as salacca syrup, candied salacca, salacca wine; witnessing or also tried art of fruits in the form of Gebogan or Pajegan; and shopping (buying fresh fruits or various types of dairy products).

**Agro-Based Plantation Coffee.** Although the potential for coffee plantations spread across a number of districts in Bali (as Tabanan, Badung, Buleleng and Bangli), but efforts to manage a coffee plantation as agro-tourism attraction based monoculture of coffee plants by utilizing a single crop has not been found. Until now based agro-tourism as a monoculture coffee plantations can be found in the Village Landih, District Bangli, Bangli regency. In order to do excursions in the area of agro-based monoculture coffee plantations in particular, tourists can perform a number of activities as follows: hiking or walk around the area of the coffee plantation, watching civet coffee plants and animals are released freely, go try the roasted coffee using traditional tools and technology, trying refined products civet coffee, take photos for a keepsake, and shopping (buying various types of refined products and craft items as souvenir)

**Agro-based Polyculture Plantations.** Agro-based mixed plantation is the most dominant type of agro-tourism. Until now, the overall attractiveness of agro-tourism in Bali, approximately 80% of which is agro-based mixed plantations. Its presence is spread across four districts, with the highest population contained in Bangli regency (40%), followed Gianyar (30%), Tabanan (20%), and Badung and Karangasem, respectively (5%). Most of the agro businesses located near the highway which is a major tourism pathways in Bali, such as along the line tourism Tampaksiring-



Ubud-Kintamani (Bangli and Gianyar regency), line tourism Tembuku-Besakih (Bangli and Karangasem regency), and line tourism Pancasari-Bedugul (Tabanan regency).

The greater part (86%) of agro-tourism based on polyculture estate commodity in Bali Province have Arabica coffee plant. Beside it, there are supporting plant, as cocoa, various spices, herbal plant, and some horticulture (fruit plant). The attractiveness of this agro-tourism is good view, the beauty of landscape, fresh environment, pre and post harvest commodity, Luwak coffee product, traditional culture, gazebo with traditional architecture, camping ground, outlet for hand-made agroindustry product and souvenir.

**Ownership and Management System.** Agro-tourism based plantation is owned by the individual who managed system informal management involving individual family members. Their involvement in this agro more effort devoted to activities related to the cultivation of crops (such as seeding, planting, fertilizing, and treatment plants), making and presentation of processed products, as well as hygiene and environmental safety. While travelers to the handling of interpreter left entirely to the travel agent. However, the majority of managers also prepare personnel interpreter agro-tourism, which generally come from the local community.

#### Agro-tourism Based Livestock

The presence of agro-tourism based livestock in Bali is still very limited. The only appeal of agro-tourism based livestock in Bali today is White Calf Maintenance Zone located in the village of Taro, Tegallalang District, Gianyar regency. Existence which still survive today is inseparable from the conception of faith communities who assess animals white cow as sacred animals and sacred. In order to do excursions in the area of agro-based maintenance of white bulls in the village of Taro, tourists can perform a number of the following activities: hiking, watching the white ox maintenance activities, especially feeding, listening to an explanation of the myth of white cattle as sacred animals and sacred, visit and sacred forests are linked to the myth of white oxen as sacred animals and sacred.

**Ownership and Management System.** Maintenance area and its wildlife white bull calf white Taro village located in a traditional village or communal rights Pakraman Taro Kaja they have inherited from generation to generation. Management system fully involves indigenous villagers with predefined rules in the form of a set of customary laws called *awig awig* or *perarem*.

#### Agro-tourism Based Fisheries

The agro-tourism based fisheries in Bali found in Denpasar. Location of fishing tourist attraction is located on a side street I Gusti Ngurah Rai which is the main tourism routes Tohpati-Nusa Dua. In addition, there is also a fishing pond in Tjokroaminoto and Kebo Iwa Street, Denpasar. The types of potential agro-tourism attraction based fisheries in Bali include the following: fishing pond is equipped with a bamboo gazebo thatched roof is quite artistic, different types of freshwater fish, where burning or grilling the fish bait, top culinary variety of freshwater fish species. Generally, tourists who visit the attraction agro-based fishery aims to conduct fishing activities and a small portion to just look around or watch other tourists who were fishing, or their arrival to enjoy the culinary delicacies of freshwater fish available in the restaurant where fishing. In addition, tourists can also cook (bake or broil) the fish inducement alone in the space provided.

**Ownership and Management System.** Most businesses agro-based fisheries in Bali is a business owned by individuals and others is collaboration between land owners to the owners of

capital. Management of attraction is generally done by recruiting local manpower employed for the maintenance and care of fish ponds, fishing tour guides, waiters, and so on.

### Integrated Agro-tourism

Integrated Agro-tourism is a business that serves a mix of agro-tourism is more than one kind of commodity as its main attraction. For instance, the present agro commodities, plantation, livestock, or fisheries as the main attraction. In Bali, agribusiness with a mixed pattern (integrated) can actually be found in several places. Like around Kintamani region, for example, there are many mixed plantation business with commodities like citrus, coffee, and horticultural crops. The same thing can also be found in the surrounding area Bedugul (Tabanan), Pancasari (Buleleng), and Pelaga (Badung). Nevertheless, the existence of agribusiness is not much managed as an integrated agro-tourism attraction. While this agribusiness which has been managed as an integrated agro-tourism attraction that can be seen in the Area Cultural Village Kertalangu, Denpasar and Agro Tourism Zone is located in the Village Kerta, District Ubud, Gianyar Regency.

Activity forms Travelers. Tourists visiting Kertalangu Cultural Village can enjoy a variety of activities which include the following: hiking or jogging, horse riding, demonstrations grow rice, duck chasing, and catching eels, fishing, cooking class, MICE, culinary, shopping. Tourists visiting the area Agro Kerta can enjoy various kinds of activities that include the following: trekking, watch or observe various kinds of crops as well as cattle and pigs, enjoy a variety of fresh fruits products, and shopping for a variety of fruits and souvenir.

Ownership and Management System. Tourist attraction Kertalangu Cultural Village is a community-owned village Kesiman Kertalangu whose management is entrusted to the private sector by implementing formal management system. Management concept is more directed at the conservation of agricultural land through its use as a tourist attraction with over promoting the participation of local communities (community-based development). While Agro Kerta which also belongs to the local community, but more management systems lead to the concept of community empowerment, which is fully involving the local community.

## **IDENTIFICATION OF INTERNAL AND EXTERNAL FACTORS**

Internal and external environmental analysis is an analysis of the internal and external conditions that affect the developing regions agro-tourism destination in Bali Province. Internal analysis includes factors strengths and weaknesses, while the external analysis includes factors opportunities and threats or challenges.

### Strengths

Some internal factors that can be identified as strengths or advantages in the development of agro-tourism destination in the province of Bali are: (1) Availability plantations (coffee, cocoa, citrus, salacca, strawberry, and others) are adequate; (2) Have a view natural attractive; (3) Land owned by itself; (4) Kopi Luwak as excellence; and (5) Experience manager or owner in the field of tourism.

### Weaknesses

Some internal factors that can be identified a weakness in the development of agro-tourism in Bali Province are: (1) The quantity and quality of plant collections are relatively limited; (2)

Quality of human resources agro-tourism not yet meet the standards; (3) There is still a lack of promotion; (4) Lack of capital; (5) Lack of plantation area which is used as agro-tourism destination; (6) The product souvenir does not have of international trade standards; (7) Landscape and treatment plants are still lacking; and (8) Competition utilization of water resources.

#### Opportunities

Some external factors that can be identified as opportunities in the development of agro-tourism in Bali Province are: (1) Networking has developed well; (2) Location of Agro-tourism in the main tourist route; (3) Curiosity tourists to the origin of plants frequently consumed products; (4) Consumers or quite a lot of coffee lovers; (5) The business of agro-tourism become a market trends; (6) Subak recognized as a world cultural heritage; (7) traffic congestion in other tourist destinations.

#### Threats

Some external factors that can be identified as a threat or challenge in the development of agro-tourism in Bali Province are: (1) Competition is getting tougher; (2) System commission is too high; (3) Price competition among agro-tourism products; (4) The hunt in the vicinity of agro-tourism; and (5) The development of other sectors of investment.

### **AGROTOURISM DEVELOPMENT STRATEGY MODEL**

Some grand strategy that can be formulated in that sustainable agro-tourism development and can increase community empowerment in the province of Bali are: (1) The increase in the value of the unique fascination with the advanced elements of local knowledge; (2) Setting standards of quality agro products are packaged and presented as agro-tourism attraction; (3) Standardization of attraction and management of agro-tourism services; (4) Establishment of agro-tourism institutional association; (5) Utilization and management of agricultural land collectively and integrated to improve the area and diversity of potential; (6) Preparation of regulatory-oriented economic principles of democracy, environmental conservation, and cultural revitalization in a more equitable and sustainable.

### **CONCLUSIONS**

There are 5 type of classification or typology of agro-tourism profile in Bali, based on commodity potency, which it have different characteristic. Based on the amount of agro-tourism destination in a region, the distribution it's concentrated in 3 regency, i.e.: Gianyar, Bangli, and Tabanan. This regency are have good potency of agriculture and crossing with core tourism destination. The combination potency of agriculture and tourism will support the growth of agro-tourism relative faster. There is some grand strategy which recommended. The implementation of this strategy hope that creating the alternative of tourism destination with increasing value added of agriculture commodity, and tourism activity which can give benefit for ecological conservation, cultural revitalization, and increasing of economic or welfare for farmer as individual or groups, especially at small scale agriculture land use.

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## REFERENCES

- Ahmadjayadi, C. 2001, The policy and support local government in the development of agro-tourism in the era of regional autonomy. Meeting of National Working Papers Agro Tourism Ministry of Agriculture; Cisarua Bogor, 11-13 October 2001.
- Akpınar, N., Talay, I., Ceylan, C., Gunduz, S., 2004. Rural Women and Agro-tourism in the Context of Sustainable Rural Development: A Case Study from Tukey. *Kluwer Journal* 6:473-486.
- David, F.R. , 2002, Strategic Management: Concepts. Sindoro A, Translator. Jakarta: PT Ikrar Mandiri. Translation from: Concepts of Strategic Management.
- Foulker, N. , 2000, "Archaeologi from Below" in *Public Archaeology*. 1(1) :21-23.
- Guntoro, S. 1995. *Panca Pesona Wisata Agro Daerah Bali*. Yayasan Bina Hayati, Denpasar.
- Kasperek, M. Agro-tourism and agricultural diversity. <http://www.gtz.de> [6 September 2004].
- Kodhyat, H. , 1997, Nature and Development of Alternative Tourism. Inside: Gunawan, MP. Proceedings of the Seminar and Workshop on Sustainable Tourism Planning. Bandung, June 29, 1996. Publisher ITB, Bandung. 74-81.
- Maruti, K.V,. 2009, Agro-Tourism: The Scope and Opportunities for The Farmers in Maharashtra. *Socio-Economic Voices*. Indiastat.com Sept.-Oct., 2009.
- Pujaastawa, I.B.G. , 2003, "Tourism Subak: Keeping the Balance Ecology and Cultural Identity in Central Bali", in *Scars Culture in Multicultural Perspective*. Faculty of Letters, Udayana University, Denpasar.
- Rangkuti, F. 2000 *SWOT Analysis: Techniques Dissecting the Business Case*. PT Gramedia Pustaka Utama, Jakarta.
- Satriawan, IK. 2005 *Design of Decision Support System Model Agro-Industry and Tourism Integration in Economic Development Planning Jembrana Regency*. Dissertation. Pascasarjana School, Bogor Agricultural University, Bogor
- Suwantoro, G. 2001 *Basics of Tourism*. Andi, Yogyakarta.
- Yoeti, O.A. 2000 *Tourism Studies: History, Progress and Prospects*. PT. Perca, Jakarta.