

Integrated Organic Agribusiness Using Technology Effective Microorganisms (EM) in Bali Island

by
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Abstract

Bali as an island of worldwide tourist destination with more than 70% of its area is agriculture area, is an ideal place to have an integrated organic agribusiness development, which includes development in the field of agriculture, industry, tourism, environment and health. EM (Effective Microorganisms) technology has been developed in Indonesia since 1990, and now it has developed rapidly and applied in various fields, such as, agriculture, animal breeding, fishery, forestry, environmental management which includes urban waste management, hotel wastes and industry as well as health field through fermentation process of spice and medical plants for traditional medication based on the Balinese Traditional Medication Technology.

Integrated organic agribusiness development using EM technology has been developed in Bali. Organic agricultural product that is produced by organic farmers are marketed with cooperation with hotels and restaurants. The formation of organic Farming Association in National Scale supports information exchange and EM technology to society widely through sustainable educational, training and research program. The recycling of organic urban waste in Denpasar City also has been undertaken to make bokashi organic fertilizer in industrial scale so that it can reduce waste pollution problems in the city and improve cleanness and beauty of the city as well as provide work opportunity for society.

Production of Balinese Traditional Medication with EM technology has been undertaken in industrial scale with modern marketing and management system. Educational and training program of EM technology that is executed in educational and training EM Technology Center has obtained a serious attention from wide community in Indonesia. This educational and training program is combined with agrotourism package in Bali island.

The application of integrated agricultural system with EM technology in a wide scale and professional supports the growth of agribusiness with involves agrotourism and industry which may improve people's welfare, especially farmers. Bali is a case of integrated EM technology development that it can be used as an interesting sample to develop model of EM technology development in global scale.

1. Introduction

The development of Bali is focused on tourism, agriculture, handicraft, small-scale and home industries. The development of tourism supports all the economical activities in Bali. The foundation of tourism is development success is the agricultural development that can make the farmers and rural people more prosperous, unpolluted the environment, and save the preservation and the beauty of Bali (Wididana, 1999). The increase of farmer and rural people prosperity can perpetuate the conservation of Balinese culture and customs. Based on the above explanation, it can be concluded that the organic agricultural development is the main key of the development of Bali totally.

The organic agricultural development using EM (Effective Microorganism) technology has been developed in Indonesia since 1990. Bali, as the world tourism destination area, rural and agricultural development is a good place taken as a

sample of total and integrated organic agricultural application using EM technology (Wididana and Higa, 1997).

Organic agricultural development will develop properly if it is supported by well-marketing of agricultural products. The application of EM technology in agriculture support the development of organic agricultural business from the production to processing industry, such as fermented production of organic fertilizer (bokashi), food crop, horticulture and spice plant, post harvest industry, and service of agro-tourism, agriculture training and education.

Integrated organic agribusiness management using EM technology has successfully been done in Bali. This writing gives some far-ranging explanation about organic agribusiness application in Bali which is useful for organic agribusiness development in other areas.

2. Organic Agricultural Development Using EM Technology in Indonesia

The important beginning step of organic agricultural development is EM Technology Training and Education Center established in Bali in 1996. This institution completed with 5 hectors of sampling unit, waste processing, and traditional medicinal industry (IPSA,1998). The sapling unit is developed by using EM technology with integrated recycling system. Farming and animal husbandry waste can be used for fodder and organic fertilizer fermentation (bokashi). The cultivation of spice and treatment plant using EM technology can produce quality medicinal plant formula. EM technology also supported the development of Balinese traditional medicinal industry, known as Ramuan Pak Oles (Mr. Oles' formula).

Up to now, 200,000 farmers and organic agriculture observers have been trained using training of trainer system. The success of organic agriculture training is followed up by the inter-farmer, researcher and government information exchange of organic agriculture. It motivates the establishment of profession organization: organic farming societies of Indonesia supported by some professions in society who give their attention to the perpetual development of organic agriculture and environment. The Organic Farming Society of Indonesia was formally established in February 2000, based in Malang, East Java. In the beginning, this organization had 100 members. It was estimated that it will have 100 branches with 100,000 members in Indonesia. The development is caused by the increase of farmer and common society's big need and attention to environment preservation.

EM technology gives the real sample to training and organic agriculture model in the field. Successful EM technology application in every field other than agriculture such as environment, animal husbandry, fishery, health and industry completely support the wide-range development of EM technology in Indonesia.

3. The Development of Organic Agriculture Location as Tourism Places

Tourism sector really support the increase of farmer income and profit because the sector rapidly develops in Bali and becomes the activator of the development of Bali. In another part, agriculture sector develops slowly because there are many things limiting the development of this sector such as economical, social, cultural and political problems. However, the agents of development in Bali realize that the agricultural development can not be neglected because the farmers and the rural people actively preserve the beauty, the culture and customs conservation of Bali. Tourism society commonly living in the urban have assignment to manage the tourist visit with good promotion and service. The products sold to the tourists are the beauty of nature, the unique and interesting Balinese cultures and customs and tourism service.

Therefore, it has been realized that the agricultural development sector has important role supporting tourism development. The agricultural system developed is sustainable natural farming system, by reducing the use of pesticides and chemical substance in agriculture so that the environment and the beauty of Bali can be conserved (Wididana and Higa, 1999). The development of organic agriculture proposed must certainly be able to reach high production, benefit the farmers materially and spiritually. The application of EM technology in the sector of agriculture can give the solutions to the above matters because : 1) easily-applied and inexpensive for the farmers; 2) EM technology has successfully been applied in many parts such as agriculture, animal husbandry, fishery, waste management which support integrated and environmental friendly farming system in small and big scale; 3) EM technology application has a wide-range network system, applied by more than 30 countries and makes information changing possibly occurred, good and service to support international organic product demand.

Therefore, to support the development of organic agriculture in Bali has stated location for organic agricultural

development as tourism object so that tourists who visit Bali will get information, goods and service about organic agriculture product. Farmer as agricultural subject and management of agricultural environment and rural area will get the real benefit from the tourism development.

4. Integrated Organic Waste Recycling

Generally, in developing country organic and inorganic is dumped in one place. City garbage dumped in wasting location is called TPA (Last Wasting Place). Waste management process the city garbage using incineration and sanitary landfill system. Both systems need high cost and using the energy from the outer processing system, that I called interrupted system.

The development of economic activity and society in the city makes handling city garbage get harder and harder because of the limited cost, time, and wasting place.

In three years, we focused the research about handling city garbage by recycling system using EM technology (Wididana and Higa, 1999). City garbage in Indonesia consists of 80% organic waste that can be recycled for fodder, organic fertilizer, mushroom cultivation media, and worm cultivation. According to the research known that some kinds of livestock that can be bred at TPA are cattle, goat, pig, rabbit, chicken, pigeon and swallow.

[Table 1](#) explains about the livestock can be bred at TPA.

There is a possibility cultivating unusual animals for specific purpose such as rodents, lizards and snakes (see [Table 2](#)). By this recycling system city garbage processing will be a great business that benefits many parties. Some business units that can be created from this recycling system explained in [Table 3](#).

5. Medicinal Plant and Traditional Healing Development

There are many information about Balinese treatment that take the advantage of medicinal plants and spices. Some kinds of medicinal plants that are recorded in healing manuscript organically cultivated by EM technology. Based on the result of research, we found that spice and medicinal plants that are fermented by EM technology gives a better medicine virtue.

The fermented medicinal plant formula that is developed known as Ramuan Pak Oles (Oles Master Formula) can cure many kind of diseases such as skin disease, injury, rheumatism, sprain and increase body stamina and that formula has been sold all over Indonesia by multi-level marketing and special for market segment in done by direct-selling system. The type of Mr. Oles' formula that has been sold, detailed in [Table 4](#).

Furthermore, to fulfill the consumer demand for Traditional Healing Service, we also prepare Health Message Service, Health Consultancy and Bokashi therapy. Bokashi Therapy is the healing method by using bokashi thermal, the body of the patient is wrapped by special vest and buried in the bokashi material that is made from wood powder, mixture of rice bran, spices, zeolite and EM ceramics that is fermented by EM technology. Bokashi therapy is useful for curing rheumatism and improving blood circulation.

Medicinal plant development and Balinese traditional healing by EM technology has a very high attention from the consumer in Bali.

6. Marketing of Farming Product

Organic product marketing, especially in Bali, is just begun by establishing organic agricultural shop and organic restaurant. The marketing development is low because the type, quality and quantity that are ready to be marketed has not completely been provided. In another case, a continual promotion must afford about the benefit of organic product for healthy and environment preservation.

The successful organic agricultural product marketing will be directly followed up by organic agribusiness. The establishment of the Organic Farming Society of Indonesia and Association of Environmental Observer will help spread the information about organic agriculture products that increase the people's need for organic agriculture.

7. Closing

Organic agribusiness development by EM technology has successfully been done in Bali. Synergistic development of agricultural, rural area and tourism may totally promote the development of Bali. The organic agricultural development cannot be developed individually but it must be combined by environmental and health development, environmental development done by recycling system, and health development donor by developing traditional healing that are all done by EM technology (Wididana, 1999).

Organic agribusiness will be successful if it is supported by well-marketing system. Agricultural development must produce agricultural product needed by the market, with low production cost and environmental friendly recycling system by EM technology gives the good solutions to organic agribusiness development.

Table 1. Kinds of livestock that can be cultivated.

<u>Kinds of livestock</u>	<u>Fodder</u>	<u>Kinds of garbage</u>
Cow, goat, rabbit	Organic market waste	Leaves, grass, vegetable
Pig	Restaurant and house waste	Rice, meat, fish, vegetable
Chicken, pigeon	Restaurant and house waste	Rice, grain, flies, larva
Swallow	Flies and other insects	

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Table 2. Kinds of animals that can be bred for specific purposes.

<u>Kinds of animals</u>	<u>Food</u>	<u>Breeding aim</u>
Rodents	Restaurant and house waste	Pharmaceutical and medical test
Snake	Rodents	Snake food
Lizard	Flies and other insects	Traditional medical
Dragon lizard	Rodents and rabbit	Traditional medical

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Table 3. Business unit can be done by recycling system.

<u>Business unit</u>	<u>Product</u>
Inorganic separation system	Recycling inorganic waste
Organic fertilizer production	Organic fertilizer
Animal husbandry	Protein
Unusual animal husbandry	Protein, experiment material
Mushroom cultivation	Traditional medicine, food
Education training and research	Service
Tourism	Service

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Table 4. Kinds of marketed Ramuan Pak Oles.

<u>Kinds</u>	<u>Healing quality</u>
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1.	Minyak Oles Bokashi (bokashi rub oil)	Skin disease, injury, stomach ache, smoothing blood circulation, increasing vitality
2.	Parem Antik (Rheumatism ointment)	Rheumatism, sprain
3.	Parem Alpha (Alpha ointment)	To quick-sleep, relaxation
4.	Brajamusti (spice tonic wine)	Increasing stamina
5.	Madu Resi (spice and honey)	Increasing stamina
6.	Madu Jamur (mushroom and honey)	Rheumatism, asam urat and cholesterol
7.	Madu sekar (flower and honey)	Diet
8.	Saribing (Propolis and herbs)	Removed stain and wrinkle
9.	EM Spa (massage oil)	Massage
10.	Muda Geruh (Pure Honey)	Traditional treatment and sweeter
11.	Minyak Rajas (oil for pet)	Livestock and animal health maintenance
12.	Banyu Kuntho (smoked water of spice and medicinal plants)	Keloid

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Daftar Pustaka

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