



UNIVERSITI PUTRA MALAYSIA

**MANAGEMENT PRACTICES OF THE INTEGRATED ORGANIC
FARMING SYSTEM IN GUNUNGKIDUL DISTRICT, INDONESIA**

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By

ARIS SLAMET WIDODO

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,
in Fulfilment of the Requirement for the Degree of Master of Science**

November 2006



Specially Dedicated To:

**My Parents (S. Triyanto and Marwiyah)
Parents in-law (H. M. Tofah and Hj. Jamilah)
Brother and sister (Hendri, Sulis, Rini, Titik and Indi)
Wife (Hasanah Safriyani)**

.....Who inspired, supported and encourage me to be a better person.



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment
of the requirement for the degree of Master of Science

**MANAGEMENT PRACTICES OF THE INTEGRATED ORGANIC
FARMING SYSTEM IN GUNUNGKIDUL DISTRICT, INDONESIA**

By

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November 2006

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An integrated organic farming system applies the concept of “*Low External Input Sustainable Agriculture*” (LEISA) and this system develops the livestock business and the crop business in one location or area using local resources to optimize inputs. This study is an attempt to analyze the management and economic characteristics of the integrated organic farming system in the Gunungkidul, Indonesia. The specific objectives of this study were: (i) to examine the socio-economic profile of farmers that practiced the integrated organic farming system, (ii) to evaluate the farm management practices, (iii) to determine the optimal allocation resources used in the integrated organic farming system.

The study comprises three components. The first was a study on the social economic profile of the respondents. The second was a study on the farmers’ management capability, based on the management functions of setting objectives, planning, controlling and decision-making. The third was a study on the optimal allocation of resources used in the integrated organic farming system.

The Likert Scale was used to measure the farmers' management capability. The Linear Programming method was used to determine the optimal allocation of resources. Descriptive analysis was also used to explain the integrated organic farming system that had been practiced in the study area. Primary data were collected from a farm survey and secondary data were obtained from relevant agencies.

The study found that the integrated organic farming system practiced is combination between integrated farming and organic farming. Organic fertilizers and bio pesticides were the organic materials always used in the farming practice. The farmers made a special bio pesticide from local materials.

The Gunungkidul farmers had applied the rotation system based on seasons in their farming practice. Paddy was planted in the rainy season, corn and peanut in the first dry season and in the second dry season, the farmers planted watermelons and inter cropped between corn and peanut. In the study area, the supply of organic fertilizer was from chickens, goats and cows. The supply of livestock fodder was from crop waste especially from paddy straw. Grass was also fed to cows and goats, especially to cows. Farmers also gave mineral concentrates that contained corn, waste from tofu and rice siftings.

The results of the analysis on management capability show that the farmers had a low level of management capability in setting objective and controlling but they had a middle level of management capability in planning and decision-making.

The Linear Programming (LP) analysis found that in the integrated organic farming system practiced in the Gunungkidul District, the farmers could maximize profits up to Rp 5,463,156. Paddy was the main crop planted on farmland of a maximum size of 0.3480 ha in the rainy season. The total income in the rainy season or Season One was Rp 1,591,904.04 which was from the sale of paddy, handicraft and compost.

In the first dry season or Season Two, intercropping between peanut and corn was more viable than the mono crop practice of planting peanut or corn on a maximum farmland size of 0.422 ha. The income in this season was Rp 2,326,069.431. The supply of paddy straw from the rainy season decreased the buying of straw in this season. The planting of watermelons (0.1849 ha) and intercropping between peanut and corn (0.2371 ha) were identified by LP to be the profitable crops that should be planted in the second dry season (Season Three). The contribution of these crops to income was Rp 1,545,182.96.

Based on the results, activities involving land, labor, handicraft, paddy straw, organic fertilizer, and farmer's income, it was concluded that only the paddy straw and organic fertilizer activities in Season One were at an optimal level. Based on these results, the farming practice generally was not at an optimal level in Jetis, Gunungkidul.

Four strategies are recommended for accelerating the implementation of the integrated organic farming system based on the LP results. The first is to increase the availability of resources. The second is to introduce a new technology in the farm and livestock activities. The third is to increase the management capability and the fourth is to develop off farm activities, especially in handicraft making.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

**PRAKTIK PENGURUSAN SISTEM PERTANIAN BERSEPADU ORGANIK
DI GUNUNGKIDUL, INDONESIA**

Oleh

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Sistem pertanian organik bersepadu menggunakan konsep “*Low External Input Sustainable Agriculture*” (*LEISA*) dan sistem ini turut dibangunkan oleh perniagaan ternakan dan tanaman di sebuah lokasi atau kawasan yang menggunakan sumber-sumber tempatan untuk mengoptimalkan penggunaan input. Secara amnya, kajian ini menganalisis aspek pengurusan dan ekonomi sistem pertanian organik bersepadu di Gunungkidul, Yogyakarta, Indonesia. Objektif spesifik ialah: (i) untuk mengkaji profil sosio-ekonomi para petani yang mengamalkan sistem pertanian padi organik bersepadu, (ii) untuk menilai amalan pengurusan ladang, dan (iii) untuk menentukan sumber-sumber peruntukan optima yang digunakan dalam sistem pertanian padi organik bersepadu.

Kajian ini merangkumi tiga sub kajian. Sub kajian yang pertama merupakan kajian ke atas profil sosio-ekonomi responden. Yang kedua ialah kajian mengenai kebolehan pengurusan petani, berdasarkan fungsi pengurusan iaitu menetapkan matlamat, merancang, membuat keputusan dan mengawal. Sub kajian yang ketiga pula adalah kajian ke atas sumber peruntukan optima yang digunakan di dalam sistem pertanian padi organik bersepadu.



Skala Likert telah digunakan untuk mengenalpasti kebolehan pengurusan petani. Kaedah pengaturcaraan linear telah digunakan untuk menentukan sumber-sumber peruntukan optima. Analisis deskripsi juga digunakan untuk menerangkan mengenai sistem pertanian organik bersepadu yang diamalkan di kawasan tersebut. Data primer telah dikumpul dari bancian ladang manakala data sekunder diperolehi dari agensi-agensi yang berkaitan dapat digunakan sebagai maklumat tambahan.

Kajian ini mendapati bahawa pertanian organik bersepadu yang dijalankan merupakan gabungan di antara pertanian organik dan pertanian bersepadu. Para petani di Gunungkidul menggunakan sistem giliran berdasarkan musim. Padi ditanam pada musim hujan, jangung dan kacang tanah pula ditanam pada musim kemarau yang pertama manakala di musim kemarau yang kedua petani menanam tembikai dan pertanian campuran di antara jagung dan kacang tanah.

Baja organik dan bio pestisid merupakan bahan-bahan organik yang selalu digunakan dalam amalan ladang. Di kawasan kajian, bekalan baja organik diperolehi dari ayam, kambing dan lembu. Bekalan makanan untuk ternakan pula diperolehi dari jerami padi. Rumput juga turut diberikan kepada lembu dan kambing.

Hasil daripada kajian kebolehan pengurusan petani mendapati bahawa para petani kurang berkebolehan dalam menetapkan matlamat dan mengawal manakala dari segi merancang dan membuat keputusan, kebolehan pengurusan mereka berada di tahap yang sederhana.

Analisis pengaturcaraan linear mendapati bahawa para petani yang mengamalkan sistem pertanian organik bersepadu di kawasan Gunungkidul dapat memaksimumkan keuntungan sehingga Rp 5,463,156. Padi merupakan tanaman utama dan pada musim hujan, padi perlu ditanam di atas keluasan tanah yang maksima iaitu 0.3480 hektar. Jumlah pendapatan dari hasil jualan padi, kraftangan dan kompos pada musim hujan atau musim kesatu ialah Rp 1,591,904.04.

Pada musim kemarau yang pertama atau musim kedua, penanaman tanaman campuran seperti kacang tanah dan jagung di atas tanah seluas 0.422 hektar amat digalakkan berbanding menanam kacang tanah atau jagung sahaja. Hasil jualan dari kedua-dua jenis tanaman ini adalah sebanyak Rp 2,326,069.431. Keputusan analisis pengaturcaraan linear mendapati bahawa tembikai (0.1849 hektar) dan tanaman campuran di antara kacang tanah dan jagung (0.2371 ha) merupakan tanaman yang akan menguntungkan apabila ditanam pada musim kemarau yang kedua (musim ketiga). Hasil jualan tanaman ialah sebanyak Rp 1,545,182.96.

Berdasarkan kepada keputusan di atas, hanya aktiviti jerami padi dan baja organik sahaja yang optima pada musim pertama berbanding aktiviti-aktiviti lain yang belum optima seperti aktiviti tanah, pekerja dan kraftangan, dan pendapatan petani. Secara amnya, amalan pertanian di Gunungkidul masih belum optima.

Berdasarkan kepada keputusan pengaturcaraan linear, dua strategi telah dicadangkan untuk mempercepatkan pelaksanaan sistem pertanian organik bersepadu. Pertama ialah meningkatkan kemampuan tanah dan sumber-sumber yang lain untuk meningkatkan jumlah pendapatan bersih. Manakala yang kedua pula ialah memperkenalkan teknologi baru di dalam aktiviti pertanian dan ternakan.

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LIST OF ABBREVIATIONS

AFTA	ASEAN free trade area
BKD	<i>Bank Kredit Desa/ Village Credit Bank</i>
BPR	<i>Bank Perkreditan Rakyat/ People Credit Bank</i>
C	Celsius
EM (EM4)	Effective Micro Organism
FFTC	Food and Fertilizer Technology Center
G (g)	Gram
GBHN	<i>Garis-Garis Besar Haluan Negara/ the Guidelines for State Policies</i>
GDP	Gross Domestic Product
GRDP	Gross Regional Domestic Product
Ha	Hectare
IPM	Integrated Pest Management
Kg	Kilogram
Km	Kilometer
L	Liter
LEISA	Low External Input Sustainable Agriculture
LP	Linear Programming
M (m)	Meter
Mm (mm)	Millimeter
NGO	Non Government Organization
OIFS	Organic Integrated Farming System
PSA	<i>Pusat Standardisasi & Akreditasi/ Central of Standardization & Accreditation</i>
RHS	Right Hand Side
RP	<i>Rupiah (Indonesian Money)</i>
SNI	<i>Standard National Indonesia</i>
SRF	Sex Ratio Feminism
SRM	Sex Ratio Masculine
UNDP	United Nation Development Programmed
USD	United State Dollar
USDA	United State Development Agriculture
WTO	World Trade Organization



CHAPTER 1

INTRODUCTION

1.1 Background

The guidelines for state policies (GBHN) of Indonesia, 1999-2004, have stated that the economic sector is a priority in national development. The development plans focus on the agricultural and industrial sectors and the balancing of the economic structure between industry and agriculture. This policy has targeted at efforts to increase the value of agriculture products and the country's ability to absorb employees into the agricultural sector.

According to Gunawan (2003), the agriculture sector has played a major role in developing the Indonesian economy for the past three decades. In 2001, the agriculture sector contributed 16.35% to Indonesian's Gross Domestic Product (GDP). At the same time, it absorbed 45.3% or 40.7 million of the total work force in the country. In addition, the agriculture sector was the lifesaver during the 1997 - 1998 financial crisis, during which, it maintained its role as the engine of growth for the Indonesian economy and continued to be so even after the crisis. As such, the agricultural sector continues to play a vital role in the economic development of the Republic of Indonesia.

The main objectives of the agricultural development policy in Indonesia are to increase agricultural productivity and to improve the welfare of farmers. Agricultural development in Indonesia for several decades has focused on increasing the supply

of staple foods, particularly rice, in order to eliminate food shortages. The technology used in the implementation of the policies had emphasized mainly on the manufacturing of chemical fertilizers to help produce high-yielding varieties.

The government policy to increase agricultural productivity and to improve the farmers' welfare has concentrated on the wetlands by improving the irrigation system. This provides greater opportunities for success in the paddy intensification programme compared to upland farming. The paddy intensification programme was widely supported by the government which meets the farmers' needs by providing amenities such as irrigation, supply of chemical fertilizers, pesticides, and other technology. On the other hand, the development of upland farming faces problems of productivity, stability, sustainability and equitability that generally is low. As a result, the areas dominated by dry land farming have low returns for the farmers (Achmad, 2003).

Accordingly, the greater attention given to the wet lands in the form of better irrigation systems has given rise to a widening gap in the productivity between the wetlands and uplands. The gap has resulted in higher income and better welfare for farmers in the wet lands compared to those farmers in the uplands.

The Gunungkidul District, located in the Yogyakarta Province of Java Island, falls within the national economic development plan. Topographically, Gunungkidul is hilly and the terrain is sometimes very steep. About 5% of its lands is wet land with the rest distributed as yard land, forest, ponds and agriculture estates. In this area, water is an urgent problem for peoples' consumption and agriculture activities. The

kinds of soil found are 15% *volcanic lateristic*, 10% *margalite*, 35% *latosol*, and 40% *limestone*. Land utilization is highest in the dry lands (55.58%) with the wet lands contributing only 5.43%. Table 1.1 shows land utilization and extensive (Ha) in the Gunungkidul District.

Table 1.1. Land Utilization and the Extensive (Ha), Gunungkidul District, 2003

No.	Utilizing of Lands	Extensive (Ha)	(%)
1.	Wet land	80.65	5.43
2.	Dry land	825.56	55.58
3.	Yard land	244.93	16.49
4.	Forestry (Government)	121.20	8.16
5.	Pond	0.74	0.05
6.	Individual Forest	12.03	0.81
7.	Critical land	112.10	7.55
8.	Other kinds of land	88.15	5.93
	Total:	1,485.36	100.00

Source: Agriculture Department of Gunungkidul Regencies, 2004.

In the Gunungkidul district, availability of natural resources has become a serious problem in agricultural development especially with 65% of working population engaged in the agricultural sector. According to The Central Bureau of Statistic, the agricultural sector GRDP (Gross Regional Domestic Product) of Gunungkidul is the highest, accounting for 40.38 % of the total sum in spite of some scarcities of natural resources. Some of the major production constraints are attributed to the weather, topography, and poor soils of the region.

According to Winarso (2002), the prosperity of a certain area is commonly measured by various indicators. One of them is income per capita. Income per capita especially reported in a chronological context can illustrate the changes in prosperity per person in that area. For example, in 2001, the income per capita of the Gunungkidul people



is Rp 3,229,356 which shows a decrease from the 2000 figures (Rp 3,317,434). The figures would generally describe the region as having a low prosperity. The low prosperity of the Gunungkidul District could be a consequence of low farmers' income in the uplands. The low productivity of dry paddy (Table 1.2.) also plays a part in constraining farmers' income.

Table 1.2. The Plants Productivity, Gunungkidul District, 2003.

No.	Plants	Productivity (Ton/Ha)
1.	Wet paddy	4.702
2.	Dry paddy	3.197
3.	Cassava	13.145
4.	Corn	1.686
5.	Peanut	0.851
6.	Chili	2.405

Source: Agriculture Department of Gunungkidul Regencies, 2004.

In addition, the agricultural program to increase the paddy productivity has to contend with problems of marginal land and scarcity of water. The specific conditions in the Gunungkidul District require a good agriculture system of production which can tap on the potential of natural resources.

Literate of Central Bureau of Statistics, Gunungkidul (2004), notes that the Gunungkidul District has potential for livestock production. Data obtained reveal livestock figures to be the rearing of cows (106 thousands), goats (118 thousands) and sheep (10.107 thousands). These populations are supported by the 244.93 ha of yard land and 133.23 ha of grassland that supplies feed for the livestock.

