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Organic Agriculture and Sustainability in the World and Iran

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ABSTRACT

The simplest definition of organic agriculture is "farming without chemical industry". Organic agriculture is known with different names in different countries, whereas 16 names are more common including such topics as biological agriculture, sustainable agriculture, and reproductive farming. In addition, implementation of sustainable agriculture contributes to economic and social profitability. However, the common agricultural patterns have imposed irreparable damages to the biological resources in Iran. Soil is one of the main components of agriculture, considered one of the mainstream substrates of plant cultivation and growth. At the beginning of implementation of organic agriculture, establishment and maintenance showed similar productivity and then, the costs and farmers' activities reduced significantly. Potential effects of this system can be seen in public health, natural resources, livestock, air and enrichment, soil fertility, etc.

KEYWORDS*: organic, sustainability, organic land areas*

INTRODUCTION

It is now three decades since international attention has been given to the issue of environmental protection, and for about two decades, the issues regarding sustainable development have been addressed. Previously, in all development projects, economic perspective, increasing incomes and greater economic efficiency were considered. However, in 1970s this idea was introduced into the minds of policy makers and the development planners argued that this procedure of economic growth would ultimately contributes to environmental degradation, social inequality, resources depletion, etc. and compensating these problems in the long run will create enormous economic. Organic agriculture was in line with sustainable development of agriculture and is called to a set of operation performed with the aim of reducing the consumption of abnormal inputs. The application of fertilizer and pesticides, synthetic preservative materials, chemical drugs, organisms that are generated by genetic engineering method and wastewater are excluded in organic agriculture. The survey indicated that global interest in organic agriculture is promising. The increasing concerns about resource base pollution, food safety, human and animal and more attentions to nature and landscape values could be mentioned as the reason for this interest. Although, in organic farms the products performances are usually 10-30% lower than non-organic farms, by a principal planning performance, production and income in organic farms can be more than non-organic farms. For examples, the organic paddies yields have been reported as 6 tones in Philippine. Experiences in the field of organic agriculture have shown that in areas of low yields by applying organic agriculture, the observed yields increased two to three times. In addition, in developed countries, factors such as consumers' willingness to buy with higher prices, subsides paid by the government and promoting ecotourism contributed to the growth of organic agriculture income. Studies in developed countries have shown that consumers are willing to pay for organic products with a price of 10 to 40 percent more than non-organic products. Today, many stores offer organic products and the market of these products are prosperous; in addition, the potential demand exceeds the supply. It is expected that in future demand growth continues, thus, supplying organic products provides the opportunity for developing countries to enter the market and allocate some shares to them. In addition to the environmental and economic benefits, organic agriculture includes several benefits in terms of social factors such as creating more employment opportunities due to using cheaper and non-imported inputs and replying on labor force. Also, organic agriculture revives traditional dishes and practices and plays a significant role in strengthening social cohesion.

History of Sustainable Agriculture

Considering two principles is important in defining sustainable agriculture. The first principleevolved with the advent of sustainable and renewable agriculture concepts in the early 1980s. In fact, this concept can be explained based on the principal of "mutual ecological effect", currently; this concept constitutes the alternative agriculture

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philosophy. The second principle was introduced in 1987 and involved the sustainable agriculture on a global scale. In this principle mutual effects of agriculture and society are introduced.

In the early 20th century, agriculture in the United States of America was in the process of industrialization. The agriculture industry in USA was greatly developed. In the early 1930s, the number of farms reached to its maximum of 6.8 millions. Mechanization expanded rapidly and the areas under cultivation developed and agriculture could compete with industry and the technology widespread quickly. At the beginning of the 20th century, the holistic concept was formed against individualism. The emergence of holistic thinking in which natural systems are viewed as a model and relies on the role of farmers in the development of systems has led to the promotion of concept that is called alternative agriculture, nowadays. During the 1900s alternative agriculture formed along with industrial agriculture. The first organized movement of farmers was biodynamic agriculture which started from the speech of "Rudolf Steiner"(1924), the founder of the science of identification of human nature.

Biodynamic agriculture principles included suitable methods of agriculture and horticulture and diversity, re-cycle of materials, avoiding the use of chemicals, decentralization of production and distribution, etc. From 1920s, biodynamic farmers have developed the principles and have reintroduced traditional methods.

Methods to Achieve Sustainable Agriculture

Sustainability is a dynamic concept and can change the growing population needs. Sustainable agriculture should involve successful management for agriculture so that it can satisfy their variable needs. On the other hand, sustainable agriculture must be able to maintain or enhance the quality characteristics of environment and protect natural resources. Sustainability involves mutual and complex effects of biological, physical, social and economical factors and a comprehensive approach to research is required to improve the existing systems and develop in the context of sustainability.

Biological Factors

- Conservation of genetic resources should be continued.
- Yield per unit of land and time must be increased substantially in order to meet the needs of the growing population.
- Long-term control of pests through integrated management and resistance in crops should be developed because usually in intensive agriculture pests may be accumulated.
- Management practices must improve to control diseases and parasites to maintain livestock production.
- In order to increase production, a balanced system of production including the crops is required. Moreover, overgrazing should be avoided.

Physical Factors

- Soil is an important resource to ensure sustainability and losses of surface soils due to erosion, loss of fertility and lack of alternative foods can lead to instability.
- Agriculture is the most important source of using water on a global scale. Ineffective use of water can cause it to be wasted.
- Poor management of water and soil in rain fed cultivation can create severe damages to the land.
- Inappropriate use of chemicals in agriculture and industry can lead to the accumulation of toxins in soil and water.
- Atmospheric changes caused by human activities have negative effects on crops.

RESULTS AND DISCUSSION

The result of organic agriculture in world and Iran: The statues of world regarding organic agriculture

Recently, organic agriculture has expanded all over the world and this method of agriculture is used in about 120 countries in the world (2006). According to a recent review (Soel, 2006), now more than 31 million acres of world lands are governed in the organic form in 623174 farms. The major growth in the area of organic farming between 2005 and 2006 is related to China and recently 3 million of pasture land in this country has been certified to be organic.

Australia, China and Argentina included the largest lands of organic agriculture. Australia with 12.1 million acres of organic farms stands in the first rank of organic agriculture lands. China and Argentina with 3.5 and 2.8 million acres are the following, respectively.

Overall, Australia/Oceania has allocated about 39% of world's organic land, next European, Latin America, Asia, Northern America and Africa with 21%, 20%, 13%, 4% and 3%, respectively (Table 1).

Diagram 2 indicated the proportion of organic land to the total agriculture land. More than 10% of agriculture land is managed by organic agriculture in Austria and Switzerland. In 2004, the market value of organic products worldwide reached to 27.8 billion dollars. The largest shares belonged to Europe and Latin America.

Table1: Land area under organic management worldwide (2006)

country	Organic area (hectare)	country	Organic area (hectare)	country	Organic area (hectare)	country	Organic area (hectare)
Australia	12126633	**Uganda**	122000	**Pakistan**	20310	**Cyprus**	1018
China	3466570	**Switzerland**	121387	**Azerbaijan**	20105	**Penal**	1000
Argentina	2800000	**India**	114037	**Morocco**	20040	**Palestine**	1000
Italy	954361	**Turkey**	108597	**Ghana**	19132	**Zimbabwe**	1000
America	889048	**Slovakia**	93943	**Venezuela**	16000	**Liechtenstein**	984
Brazil	887637	**Paraguay**	91414	**Sri Lanka**	15379	**Albany**	804
Uruguay	759000	**Poland**	82730	**Guatemala**	14746	**Malaysia**	600
Germany	767891	**Romania**	75000	**Philippine**	14134	**Mosaic**	600
Spain	733182	**Dominican republic**	72425	**Costa Rica**	13945	**Armenia**	598
England	690270	**Lithuania**	64545	**Thailand**	13900	**Benin**	400
Chile	639200	**Nicaragua**	59000	**Saudi Arabia**	13730	**Kirgizstan**	400
France	534037	**Tanzania**	55867	**Syria**	12500	**Malawi**	325
Canada	488752	**Indonesia**	52882	**Bulgaria**	12284	**Bosnia-Herzegovina**	310
Bolivia	364100	**Netherlands**	48152	**Moldova**	11075	**Fiji**	200
Austria	344916	**Stove**	46016	**Cuba**	10445	**Iran**	200
Mexico	295046	**New Zealand**	45000	**El Salvador**	9100	**Macedonia**	192
Czech republic	26120	**South Africa**	45000	**Croatia**	7355	**Mali**	170
Peru	260000	**Lithuania**	43902	**Cameron**	7000	**Morris**	150
Greece	249488	**Norway**	41035	**Vietnam**	6475	**Madagascar**	129
Ukraine	241980	**Kazakhstan**	36882	**Israel**	5960	**Guyana**	109
Sweden	206579	**Colombia**	33000	**Panama**	5244	**Togo**	90
Portugal	206574	**Ireland**	30670	**Island**	4910	**Trinidad Tobago**	80
Sudan	200000	**Russia**	30000	**Luxembourg**	3158	**Laos**	60
Zombie	187694	**Japan**	29151	**Senegal**	2500	**Rwanda**	50
Kenya	182438	**Korea**	28128	**Blaze**	1810	**Georgia**	48
Bangladesh	177770	**Ecuador**	27436	**Honduras**	1823	**Burkina Faso**	30
Finland	162024	**Egypt**	24548	**Aljazeera**	1400	**Jordan**	30
Tunisia	155323	**Belgium**	23728	**Jamaica**	1332	**Malt**	13
Denmark	154921	**Slovenia**	23032	**Taiwan**	1092	**Niger**	12
Hungary	128690	**Montenegro**	20542	**Lebanon**	1039	**Total**	31502786

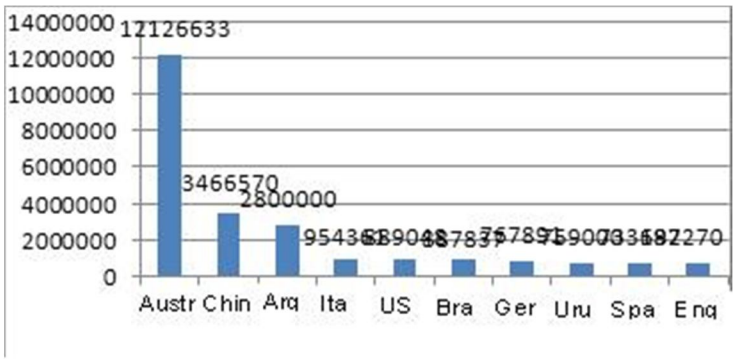

Diagram1: 10 countries with largest organic agriculture lands

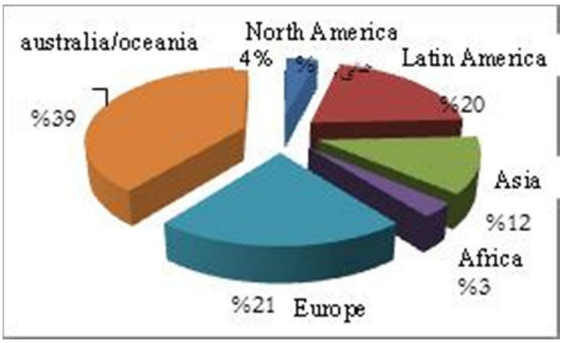

Diagram2: The total area of organic cultivation in the world-each continent share

Iran Situation of Organic Farming

According to global statistics, the area under organic agriculture cultivation in Iran (published statistics in the report of "The world of organic Agriculture", 2006) is 200 acres and the number of organic lands in Iran is only one (Table 1). However, based on statistics of the Department of Agriculture, Ministry of agriculture (2001), the total area of crop cultivation (without using pesticides and chemical fertilizers) in Iran was about 239462 acres and 125802 acres of it were horticulture crops and 113659 acres of it consisted of agriculture crops.

The total area under the cultivation of crops without using chemical pesticides was about 808612 acres including 254134 acres under agriculture and horticulture cultivation that are produced without fertilizers and pesticides. Agriculture and horticulture crops cultivation involved 1 and 7.2 percent of total crops cultivation in the country. The above-mentioned Figure and statistics only indicated Iran's potential to produce organic crops. Due to lack of organizations to provide certifications for these organic products in the country, the cultivation area of these crops is not listed in the global statistics and consequently, Iran stands in lowest ranks (Table 1).

The Significance of Organic Agriculture in Developing Countries

Ethiopia is a developing country that the farmers in this country consisted 85% of its population. This country created an organic agriculture system in all agriculture areas and became one of the most important exporters in the world. At the beginning of this project, establishment, maintenance and preservation had the same productivity and then farming activities and practices costs reduced dramatically. Moreover, this approach in agriculture could have a significant impact on farmer's self-reliance to produce agriculture crops according to domestic needs.

CONCLUSION

Organic agriculture has been expanded rapidly in recent years worldwide and now (2006) in 12 countries it is applied in an area of 31 million acres. In Iran, a small area (200 acres according to international statistics and 239462 acres based on the statistics of Department of Ministry of Agriculture) has been allocated to organic agriculture. However, this only represented a low level of agricultural lands where pesticides and fertilizers are not used. Unfortunately, organic agriculture has not sufficiently developed in Iran. If the potentials of organic cultivation development are well utilized and the obstacles to it are removed, we expect to observe progress in the development of this type of cultivation. There is a great potential in this field in Iran. The size of agricultural lands and areas are small and most of them (80%) are less than 10 acres. This suggests that Iran's agriculture has failed to move from traditional agriculture to mechanized agriculture, and the agriculture system of Iran is still governed by peasants. In this system, farms occupy a small piece of land and the crops are mostly for farmers' self-consumption. However, in organic agriculture the utilization parts should be small. This is mostly due to the fact that the larger the size of parts, the more complex the ecosystem interactions. As a result, farmers cannot control all the factors. Thus, small parts of utilization are considered an opportunity for the development of organic agriculture and Iranian agriculture can use this opportunity in a good way to develop organic crops cultivation.

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