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## **A Perspective on Organic Agriculture in China - Opportunities and Challenges**

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### **1 Overview of Chinese Organic Agriculture**

With the rapid development of international production and trade in organic food, organic agriculture is also boosting in China. The milestone of Chinese organic agriculture was set in 1990 with the first export of a certified organic product (tea) from Lin'an county of Zhejiang Province, China, which marked the launch of organic production in China. By the end of 2005, there had been about 4.384 million ha organic land, including 1.694 million ha organic, 0.61 million ha conversion as well as 2.08 million ha collection area, about half of which is certified area. About 4.93 million tons organic products and nearly 1600 projects had been certified with 300~400 varieties. According to the above data, now China ranks the 3rd largest country of organic production in the world.

In China, organic development mostly is export oriented, the export products include beans, rice, tea, mushroom, vegetable, processed oil and herbs, etc. According to the certifying body COFCC of Ministry of Agriculture (MOA), the value of exported organic products increased from 0.3 million USD in 1995 to 0.35 billion USD at the end of the year 2004. Chinese domestic organic market started from 2000. Presently, most of the products sold in domestic markets are certified by COFCC and OFDC in some largest cities such as Beijing, Shanghai, Guangzhou, Nanjing and Shenzhen, etc. The price of the organic products is often up to 3 times the price of conventional products. Average organic food consumption accounts for 0.08% of the conventional food (LI 2006).

### **2. Opportunities for Chinese organic agriculture development**

#### **2.1 Background and basis for the OA development in China**

All forms of sustainable agriculture in China are based on 4000 years of traditional practices such as crop rotation, compost application with matter recycling as well as some traditional ecological models, like "mulberry base combined with fish pond", which enable maintenance of soil fertility and good environment ecosystem through thousands of years of cultivation without modern inputs.

The so-called Green Revolution based on high inputs of fertilizer, the application of hybrid technologies and improved irrigation was widely extended to China only in 1980s, which indeed greatly improved the food security and affected Chinese agricultural. Almost all of the farmers still keep the traditional agricultural style; in fact most of the farmers have no money to input in the fields, they have to keep the original agriculture practice such as crop rotation, diversified plantation, manure application and legume crop integration, etc. for soil fertility maintenance and pest & disease control. This provides good basis to developing organic agriculture in these areas.

The improper application of chemical inputs in food production resulted in a series of problems, such as resource exhaustion, destruction of the eco-environment and food safety, etc. As a result, Chinese Ecological Agriculture (CEA) was promoted by the Chinese government from the late 1980's to early 1990s. Supported with modern science and technology, CEA was thus not only an evolution of traditional, biological and organically based agricultural production systems, but also a new alternative to decades of conventional agricultural practices (YE 2002).

#### **2.2 Diversified agro-ecological conditions and way of development**

The natural conditions are also favorable to developing organic agriculture in China. For example, Liaoning, Heilongjiang and Jilin located in northeast China occupy 15%

of cultivated land are with loamy fertile soil, abundant rainfall and cold weather. In these regions the grain production in check plot (no fertilizer) is more than 6000kg/ha for maize, 4500kg/ha for rice and 1500 kg/ha for soybean. Diseases seldom happen in these regions due to cold weather.

The southeast area of China, such as Zhejiang, Fujian, Jiangxi, Guangxi, is abundant in natural resource. Organic farming can be developed in an easy way, with organic tea, mushroom, wild collection products such as bamboo shoot and tea oil being the dominant products. The low-income and marginal areas are located in western regions, such as Guangxi, Guizhou, and Yunnan, which comprise the major areas of Yungui Plateau. Middle mountain area includes Jiangxi, Sichuan, Hunan Province and Northwest region includes Xinjiang, Shanxi, Gansu and Inner Mongolia area. Crop production is diversified in these regions and low input in agricultural production makes the products naturally organic. This situation can be improved with the development of organic agriculture. At present, organic farming is just emerging in this region and promoted by the government as a strategy to benefit the social, economic and environment development in the future.

The east coastal area, such as Hebei, Jiangsu, Shandong and Zhejiang provinces, is relatively developed. The farmers here are well educated and easy to accept new ideas. Although they are used to apply chemicals these years, they can implement new technologies to produce organic products, such as vegetables and fruit with high additive value.

### **2.3. Surplus labor in China rural area**

Organic operation is labor intensive, so organic agriculture can improve the employment especially for woman compared with the conventional production system. From the survey data of 2003, the employment rate with organic farming can be 25%–40% higher than conventional production and 20–60% higher for woman. This would be constrains for some developed countries with high labour cost. But for China, with 210 million surplus labours in rural area and relative labour cost for 10-30 Yuan/ day, organic agriculture would be an attractive business. Organic operation can also improve the incomes of the farmers. Normally the premium price of the organic products will be 20%–200% higher than the conventional ones. Research on “Comparison Benefits between Organic and Conventional Production” shows that organic farming increases woman’s income at about 25%–40% (GREENPEACE 2003). In Wanzai, Jiangxi Province, the average net income per capita is around 1000RMB in conventional agriculture before 1998, and now was increased to about 2200RMB after they converted to organic agriculture. This provides a good choice for rural development.

## **3. Constraints for the development of Chinese organic agriculture**

### **3.1 Lack of substantial and practical techniques**

Chinese organic production was promoted by the global trade; the increasing market makes the products to be certified in a short time, so the enterprises turn to the favorable area mentioned in part 2.2. Although the organizer of the organic production set up a set of quality control system to guarantee the conformity of the organic regulations, but the substantial technologies for pest and disease control, soil fertile maintenance were transferred to the farmers and were not well implemented. The essence technology of the traditional agriculture and new techniques was not well summarized, developed and implement, the farmers can not find practical techniques once they meet some problems which will cause crop failure.

### **3.2 Lack of persistence of organic production organizer**

For a long term, not all the organic production organizers - enterprises will do the organic farming continuously, especially for the companies who want to get benefit in

a short time. The enterprise should pay for 20,000–40,000 CNY for organic certification every year and spend much time and energy for the internal managements, the cost is too much for the enterprise to develop organic products. Most of the enterprises do not regard the organic certification as the tools or way to improve the production quality of the enterprise, they just want to get the certificate, so some of them will stop the organic certification after one or two years, especially when the foreign market is not good.

### **3.3 Organization mode of organic production was not assured**

Currently, organic food production in China are organized in three styles, 1) own lands with hired labour as western countries; 2) rent the lands from the farmers, with farmers only earning their salaries; 3) “Company + Farmers” pattern. For farmer organizations, most of them are small grower groups, so it is hard for the companies to control. Most of the farmers do not know the essence of organic production. They only know that no chemical substance is allowed in organic production, the economic aspects attract them to cooperate with the enterprises.

### **3.4 How much price premium can the farmer obtain?**

Generally, Chinese farmers are “too poor, too weak and too isolated to embark on conversion to organic agriculture”. As far as price premiums and their trends are concerned, Green Food (A grade) no longer earns Chinese farmers any significant price premium, but do provide a competitive advantage in the domestic market. In contrast, organic price premiums remain high for some products, while for others the premiums decrease as global competition escalates (IFAD 2005). In fact how much benefit the farmers can get is not known, but it will be better than the conventional production.

### **3.5 Lack of policy support**

Less support from government and enterprises is another constraint for the farmers to develop the organic farming. At the early stage of organic farming, crop yield will decrease greatly due to no inputs. The farmers will suffer during the conversion period, because no products will be traded and the farmers will get no benefits at this time. Chinese government is facing great tension in food security. It is forecasted that 550 million tones grain would be needed in 2010 which is 15% percent higher than real production. They are trying their best to ensure food production by encouraging the chemical input and controlling the grain planting area. This would be the vital constraint for the development of organic agriculture. There is just one way they can put great effort in organic agriculture if we prove scientifically that organic agriculture will not reduce grain production. So, research on scientific operation technology, reasonable management measures and standards and the demonstration of successful business model are necessary in next phase.

## **4 Some Strategies**

The secret of everlasting prosperousness of traditional Chinese Agriculture relies on Chinese farmers’ hardworking, frugality and intelligence. The farmers are good at spatial aspect, using dejection from human beings and animals, plus all sorts of trash, to improve soil fertility, and recycling useful substances to increase resource use efficiency. In order to achieve better organic agriculture in China, people should inherit and absorb the experience of traditional agriculture, combine the plantation with breeding and make use of crop straws, pasture and bean cake to transfer them into edible animal proteins, meanwhile provide a great deal of organic fertilizer, which will reduce fertilization and alleviate pollution. This approach can keep substances such as nutrient, energy and water in a closed cycling process and maintain soil fertility.

At present, major parts of Chinese organic agriculture production bases are located in remote areas with superior environmental conditions. The maintenance of soil fertility has to count on spontaneous rotation cropping, legume plantation and green manure plants. Prevention and cure of diseases and pests mainly rely on balance between natural enemy and application of biological pesticide, while this kind of system has very slow nutrient conversion rate, poor stability and low yield. People have very limited knowledge of the process of keeping yield which mainly base on the potential of natural system itself, particularly the processes of the material cycling and energy conversion. Consequently, people don't think deeper about natural potential of systems.

Thus, it is necessary to carry out research from technology point of view and make some modifications about traditional organic agriculture, to allow integration of each factor within the whole agricultural ecological economy domain, then building up systematic agricultural production, focusing on the self-replenishment of soil fertility. It is necessary to make appropriate use of multiple cultivation systems such as rotation cropping and inter-cropping to improve energy utilization efficiency, fertility, and use efficiency of water and nutrition, and to manage various diseases and pests by integrating physical and biological methods and natural compound.

There are huge gap between organic agriculture and traditional agriculture in terms of cost and production management, etc. As regards to changes of economic structure system and the energy transformation process, so far, no investigation has been performed in China. Therefore, enormous effort should be put into the following five major areas, including hydrology, soil, atmosphere, and plant and soil microbiology, to study the abiotic and biotic constituents within these systems. Based on multi-disciplinary theory and method, the mechanism of structure and functional changes will be deciphered behind the application of water resources, soil, fertilizer and gas. Analysis of ecological status will depend on the quantitative inspection system's structural change, as well as the observation of changing pattern which is influenced by the different manner of production based on historical data. At the same time, we should strengthen the comprehensive evaluation of production, cost and social benefits of organic agriculture by selecting circumstances such as energy transformation, cycling of nutrients and the ecological environment to evaluate the economic profit of organic agriculture, on the other hand, choosing the ratio of commercialization, the degree of opening and the product quality to evaluate the social benefits.

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