

Analysis of Organic and Green Food Production and Consumption Trends in China

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Abstract: The main objective of this review is to analyze the trends of organic and green food production and consumption in China. The organic and green food industry in China has experienced rapid development during the past decade. This development is incited by increase in disposable income, healthy consciousness of the society, consumer knowledge, promotion campaign and environmental concerns. However, the primary incentive for the development of the organic food market in China remains the export. Consequently, the consumption of organic products in the local market is low. High production costs, limited governmental subsidies, lengthy certification process and the belief that organic movement is a fashion introduced from foreign countries are the major impediments of organic food producers to survive in China.

Keywords: Agriculture, China, Green Food, Organic Food, Production, Consumption

1. Introduction

Nowadays, China is becoming a remarkable market where a small but increasing demand in green as well as certified organic food has been observed in the past ten years. Due to its utter size, China already has the fourth largest organic agricultural land area, and it added the largest number of hectares to its certified land area in 2011, more than any other country [34]. Even though the demand for organic product is high for export market, it appears that only 1.5% of total food consumption in China is organic. Organic food consumption has increased in popularity and is said to grow to 5% of the market by 2020 [16].

Since the early 1980s, the issue of environmental protection and a reduced use of chemical fertilizers and pesticides were promoted by the Chinese government [27, 9]. China's environmental concepts have become internationally the most serious agenda. Recent studies show that, China, as the world's largest manufacturer, will be facing considerable environmental problems along with the most development opportunities [9]. The country is considered as key part of the world's supply chain and consumer market due to its large

capacity in food item production. The appropriate development of green marketing concepts and practices can aid and involve joint efforts from all stakeholders [23, 43]. Therefore, for china to tackle its environmental problems it is a substantial reason to develop further the awareness of farmers on green cultivation.

Historically, in the year 1990, the first certified organic food product was produced in China. In the same year, the country took an initiative and exported its first organic product, certified organic tea, to different European countries. By the end of 2010, China became the country with the 6th largest area under certified organic agricultural cultivation and market worldwide [38]. The 1.39 million hectares under organic cultivation in the country represented 3.76% of the total organic area worldwide, but it only accounted for 0.27% of total agricultural land in China and most organic area belonged to small scale farms [15]. These days, local production of Chinese certified organic foods is mainly for export, serving international markets in North America, Europe, and Japan. These products include honey, soy powder,

beans, sesame, walnuts, pumpkin seeds, grains, oil, vegetables, fruits, beverages, dairy, poultry, and aquaculture.

From 1995 to 2006, the export value of organic foods rose from \$300,000 to \$350 million, with an annual growth rate of 30 percent. In 2007, more than 2,500 organic enterprises produced and sold organic products domestically and for export. The organic sector is still in its preliminary stages, and most exports are in raw form with minimal processing. In the last two years, a few highly processed products, such as organic chocolates, beverages, cleansers, and personal care products, have entered the domestic market [17, 23]. Although the majority of Chinese organic products are exported, domestic demand is also significantly increasing [32]. Market reports suggest that the rising demand for organic food in China is associated with increasing disposable income and a belief that imported food may provide protection from the various food scandals that have beset China. Actually, it is not only disposable income which affect the consumers purchasing intention, but also other factors which are explicitly discussed under a separate section in this review.

Interests in organic food rapidly increase throughout the world in response to concerns about intensive agricultural practices and their potential effects on human health and the environment. In China, like many other Asian countries, rapid socioeconomic development is supported by modernization and industrialization of agro food production [38]. The government of China has promoted an industrial agriculture characterized by heavy reliance on synthetic chemicals to protect crops against weeds, pests and diseases, thus leading to improved productivity. Nevertheless, the lack of sufficient training of farmers has resulted in the inadequate use of pesticides; that is, the recommended application levels and application frequency are not always followed, nor is the pre harvest interval strictly observed [37].

Concerning its distribution channels, Organic products are distributed through conventional supermarkets or specialty stores. In addition to this, online stores and home delivery are other mode of delivery. Among the organic products, Vegetables, beans, and rice comprise the majority of

domestically consumed products [35, 21]. In Beijing and Shanghai, imported organic lettuce and carrots may be found in upper class neighborhoods. Organic animal production has only recently begun. Pork is the only Chinese certified organic meat found in supermarkets. Imported organic meat may be found in high-end supermarkets, but this is rare as most imported product does not have Chinese certification. There have also been cases of unofficial (illegal) organic labels on chicken, lamb, fish, and beef [32]. Therefore, because of complex nature of supply chain of organic products, it needs strict supervision of agents and other actors of the supply chain.

In the context of the Chinese food market, it is paramount important to differentiate between ‘organic food’ and so-called ‘green food’ that has currently got popularity in China [29]. Green food is promoted as high quality food that is pollution-free, safe, and nutritious [19]. However, it is important to emphasize that green food is not identical with certified organic food. In China, the green food label is more widely known than the organic food label. In a recent survey, half of the participants did not know how to distinguish organic food from green food [42]. Similarly, [37] found that consumers’ knowledge on organic food is rather limited in China when compared to developed countries still; knowledge about organic food may differ between cities and food categories. A study in Chengdu showed that 91% of the participants knew about organic food in general while another study conducted in Shanghai and Nanjing showed that only 38% of the participants knew about organic pork [20].

The Green food label refers to a category of food that is grown in a safe and ecologically sound manner [23]. There are two standards for green food: the ‘A’ grade green which represents a transitional level between conventional and organic food, allowing restricted use of chemical fertilizers and pesticides, and the ‘AA’ grade green food, which represents full organic status. Additional explanation on the difference between organic food and green food of ‘A’ grade is given in the following table.

Table 1. Differences between organic food and green food with grade ‘A’.

Organic food	Green food grade ‘A’
No harmful chemicals or pesticides have been applied for at least two years for annual crops and three years for perennials.	Chemicals and pesticides can be used in a limited amount to improve soil quality and prevent pests.
Farms and processing plants are inspected annually in order to get their certificate extended.	Farms and processing plants are inspected every three years in order to get their certificate extended.
Certification of land and practices	Certification of products
No GMO	GMO tolerated

Source: [8]

The majority of food sold in the domestic market is of ‘A’ standard, not ‘AA’. In line with the trade literature, the study shows that fruit and vegetables are the most popular type of green food purchased and the main distribution channels are supermarkets [24].

This Review paper aimed at analyzing the trends of organic and green food in china both from both supply and demand sides. Accordingly, in this review, sections such as benefits of

green food marketing concept, motivating factors to purchase organic and green food, types of food categories available for consumers in China, factors that influence customer purchase intention of organic and green products, challenges and opportunities of organic agriculture and organic and green food certification system in China are included. Finally, concluding remark is also included in this paper.

2. Benefits of Green Food Marketing Concept

Green food in China is a response to different complex environmental and other factors as stated above. These factors include: environmental pollution; pesticide contaminations; the desirability of maintaining good health for the population of both farmers and consumers; the need to produce safe and nutritious food for the world's most populous nation; the goal of raising farm incomes; the excesses and eco-blowback of the so called "Green Revolution"; the desire to keep farmers on the land and stymie the drift of the workers to the cities; the bad press and image of China-produced food in both the local and the international market; and so called "green barriers" to China produced food in international trade [12, 21].

Green Food certification serves as a reassurance to both domestic consumers, and to international food manufacturers sourcing ingredients in China. The benefits of Green Food are multi factorial. Currently there is a substantial gap between rural-dweller and urban-dweller incomes, and this can be a potential source of social unrest, and creates an incentive for rural to urban migration [25]. In addition to this, Green food reduces chemical input costs, and delivers a 10% to 50% price premium to producers [18] without sacrificing productivity, and can thus serve to increase farmers' incomes.

On top of this, green food goes some of the way to resolving many problems and challenges for China - and benefits that accrue to China ultimately accrue to the world. China's Ministry of Agriculture states unequivocally that: "The food security in China will have an important bearing on world food security" [25] and it is food security that underpins every other form of security, safety, and global well-being.

Where others have failed [10], China has successfully created and implemented, on a massive scale and over nearly two decades, a certified food scheme that is a "half way house" between what originally characterized as "chemical farming" and "organic farming" [2].

This agricultural innovation has already led to ten million hectares of China's agricultural land being Green food certified [13]. With multiple issues driving the push to both Green and Organic food, this pathway to Green and to Organic in China can be expected to continue.

The greening of China's food is one element of a bigger vision and concern of the Chinese leadership. The Chinese Government has been attaching more importance to ecological development. For instance, China State Forestry is implementing a 50 year program to increase forest coverage in China, from 16% to 26% of land cover, and to rebuild a beautiful landscape while implementing the principle of giving the priority to ecological benefit [14].

3. What Motivate Consumers to Purchase Organic and Green Food

In the food marketing literature, there is a general consensus as to why people buy organic food. Many studies posit that

organic food purchase behavior is motivated by the perceived healthiness of such products [12].

Health concerns are based mostly on the presence of pesticides and additives in conventionally grown food as well as genetically modified ingredients. Together with personal health concern and concern about the degradation of the natural environment, product attributes such as taste and quality are important [22]. In a large-scale study of the adoption of organic food by Chinese consumers, healthiness, taste and environmental friendliness were found to be important attributes [31]. Health concerns outweigh environmental concerns in terms of influencing the purchase intentions of Chinese consumers [37].

While some studies conclude that ecological concerns (i.e., protection of water supplies, wildlife and overall balance of nature) are important in explaining consumption of organic foods (for example, [44], others show that they are not so important and environmental concern ranks slightly lower than healthy content [26]. In a study of Chinese consumers, consumers were driven more by self-oriented motives rather than altruistic or other-oriented motivations (i.e., support for small-holder farmers, animal welfare and environmental preservation).

Therefore, pulling the studies together, two basic positions are clearly advanced in the literatures. Accordingly, there are both personal (health consciousness) and environmentalist motives prevailing in the behavior of consumers of organic and green product buyers in china.

4. Food Categories Available for Consumers in China

In China there are three different types of food in terms of environmental friendliness and safety of consumption, owing to different standardization systems in place [36]: normal, green and organic. Normal food has measurable standards of quality and sanitation, yet these relate only to the primary production stage. Green food implies planting or breeding under zero environmental pollution conditions, and processing according to normal sanitary standards. Caught between the two, organic food develops slowly due to its unclear market positioning. Overall, while it might be questionable to claim that normal food is absolutely safe, this is not the case with green and organic food. Consequently, the terms green and organic are used by Chinese consumers interchangeably to simultaneously cease their environmental and safety concerns.

According to the other category stated in literature, there are three food categories in China that carry certification, and thus have some claim to being eco-food or eco-labeled food [13]. Two of these are Chinese standards, Green food and Hazard-Free food, and the third, Organic food, is certified to international standards.

The Organic food sector is jointly overseen by the Ministry of Agriculture (MOA) and the State Environment Protection Agency (SEPA). Some statistics and comparisons will be presented for each of these three schemes in the following figure.

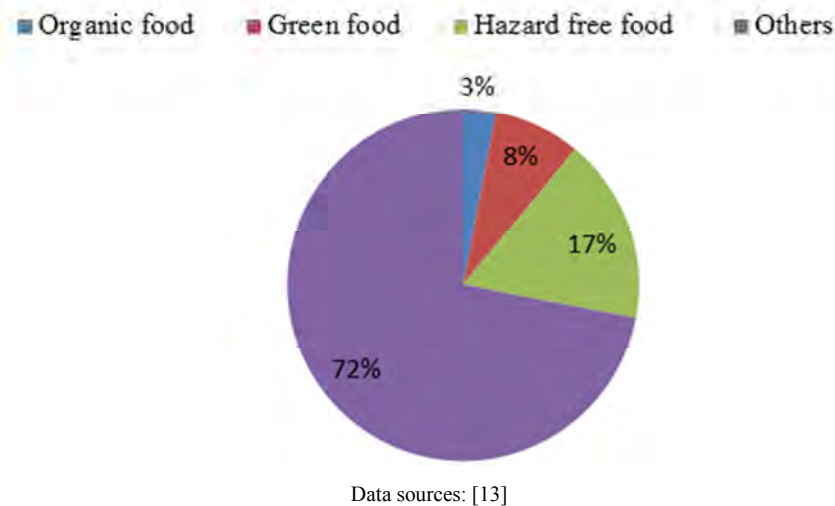


Figure 1. Distribution of Organic, Green and Hazard-Free production relative to the total (122m ha).

5. Factors Influencing Consumer Attitude Towards Organic and Green Foods

Several different factors have been found to have a certain influence on consumer attitude towards organic food. This part summarizes and discusses the influence of these factors on consumer attitude.

5.1. Health Consciousness

In regard to the context of organic food, [30] suggested that positive attitude towards organic food of consumers is originated from the belief that organic food is good for health, thereby they can consume without any fear and hesitation.

5.2. Consumer Knowledge

Consumer knowledge about organic food could be gained from different sources. [11] demonstrated that information about organic food which is showed in the market can have a significant influence on subjective knowledge of consumers. Apparently, knowledge regarding organic food is impacted by public administration such as local governments, social media, social networks, notifications from ecological organizations and advertisements. Subsequently, prior experience is also considered as essential factor that influence consumer knowledge towards organic food.

5.3. Environmental Concern

According to [6] consumers that are more involved in organic and environmental friendly related issues, such as environmental protection tend to have positive attitude towards organic food and strong intention to purchase.

5.4. Personal and Subjective Norms

[28] defined personal norms as an individual's beliefs that acting or behaving in a certain way is right or wrong. Studies suggest that personal norms have a strong impact on consumer

choice between organic and non-organic food, also influence on their attitude. In other words, consumer attitude towards an object is deemed to be influenced by consumer self-beliefs [31]. On the other hand, subjective norms are defined as the social pressure for an individual to engage or comply with a group behavior such as family and friends. These norms are normative beliefs and expectation that the groups or important referents have on this person [1]. In relation to attitude, subjective norms have a positive influence on consumer attitude towards organic food. It is aligned with the study by [3], who claimed an indirect effect of social norms on consumer attitude.

5.5. Social Norm

Social norm is based on normative beliefs and motivation to comply with other persons' wishes [1]. Normative belief refers to the significant others like family and friends regarding whether one should/should not do something. The motivation to comply with others' wishes means the willingness of someone to behave according to expectations of family and friends [1]. Previous studies found that there was a critical relationship between consumer social norms and organic food purchase intention [6]. If the people who are significant to consumers have positive attitudes and opinions towards organic food, consumers are more likely to have positive intention to buy organic food [2].

5.6. Income Levels

Consumers pay attention to higher food quality with increasing income, such as the growth of the middle class in China and income growth is likely to boost food demand considerably in China [43]. Because the price of green food is 10 to 50% higher than the normal food, middle and high income consumers are likely to afford to buy it.

5.7. Education Levels

Consumers with higher education are more likely tend to buy green food. This is due to the fact that they are more aware

of the advantages of the health aspects as well as the fact that there is little or no use of chemicals. Simultaneously, it means there is not enough environmental and green consumption education of the public in China [33].

5.8. Promotion

In order to promote consumers' buying green food intention, it is necessary to do promotion activities. Others have argued high purchasing convenience tends to more likely bring green food consumption [21]. Certainly, a good green food selling channel is an important reason for green food consumption. A previous study shows that 30% of consumers cannot translate their green food consumption intention into real purchases due to purchasing inconvenience [39]. Therefore, food producers need to seek more convenient channels for consumers to buy green food.

In addition to the above, a number of studies have examined Chinese consumer behavior towards organic food [2]. These first results show that consumers hold positive attitudes towards organic food, are willing to pay a price premium [10], and that Chinese consumers make inferences about organic food that differ from conventional counterparts. [4] identified organic labeling as a main determinant of Chinese attitudes and beliefs about organic food which in turn influences consumers' inferences about taste, health, price, and quality expectations. Furthermore, underlying reasons for rejecting organic food in China pertain to higher prices and limited availability [37].

Consumer demographics are also considered to be one of the most important aspects of consumer characteristics. [33] have pointed that demographic profiles of consumers such as their gender, age; education level and income significantly impact their purchase behavior of organic food. In terms of gender, the majority of studies show that women have more positive attitudes towards organic food than men (for example, [5]). Women eat fruits and vegetables more frequently than do men. They are also more willing to follow recommendations given by health experts than men do.

Finally, the younger the consumers, the stronger the willingness they have to purchase organic food. This is because young people can easily accept new things, and their consumption concept is considerably advanced [37].

6. Challenges and Opportunities of Organic Agriculture

In the recent ten years coinciding with global trends for growing organic markets China has managed to establish a considerably large sector of organic agriculture.

In 2005, the major breakthrough was achieved when a national institution for accreditation of certification bodies was established and relevant regulations have been passed. It was also the time when Ministry of Agriculture changed its policies and became more supportive towards organic agriculture [29].

However, it will need some more years for the sector to

overcome its teething troubles. In suburban areas severe pollution problems of water, soil and air make it difficult to obtain organic standards and questions remain whether the stipulated conversion period of up to three years is sufficient in peri-urban areas.

Additionally, high production costs and a limited domestic market make it difficult to survive for organic producers as long as there are no or only limited governmental subsidies. Moreover, producers aiming at the international market complain about the costly need of multiple organic certifications for different regions. Overshadowed by recent scandals the sector suffers from the poor image of China's food safety and still has to win consumers' trust. This is especially the case for the development of a domestic market which exists only in bigger cities. To many Chinese consumers the modern organic movement appears as an expensive concept or fashion introduced from foreign countries. However, recent food safety scandals have increased the demand for reliable and healthy food, this opens new opportunities for organic markets provided they are transparent and reliable [7] and [29].

7. Organic and Green Food Certification System in China

Food safety and sustainability are two important dimensions in food quality, so that green or organic food with less chemical residuals has become more popular across the world [37]. China is no exception. After a series of severe food safety scandals (e.g. adulteration of Melamine in milk in 2008 and the recent gutter oil scandal), the Chinese government has adopted a comprehensive food certification system to enhance and ensure safety [40]. For instance, criteria to be followed for the certification of green food are given in the following table.

Table 2. Green food production environmental criteria need to be met for certification.

S.N	Criteria for certification
1	Area should meet the highest grade of air standards in China
2	Heavy metal residues are restricted in irrigation, water and soil (tests for mercury, cadmium, arsenic, lead, chrome, etc.)
3	Processing water must meet the National Drinking Water Standard
4	Chemical applications are restricted and regulated, and some of the most poisonous pesticides and herbicides are banned

Source: [10].

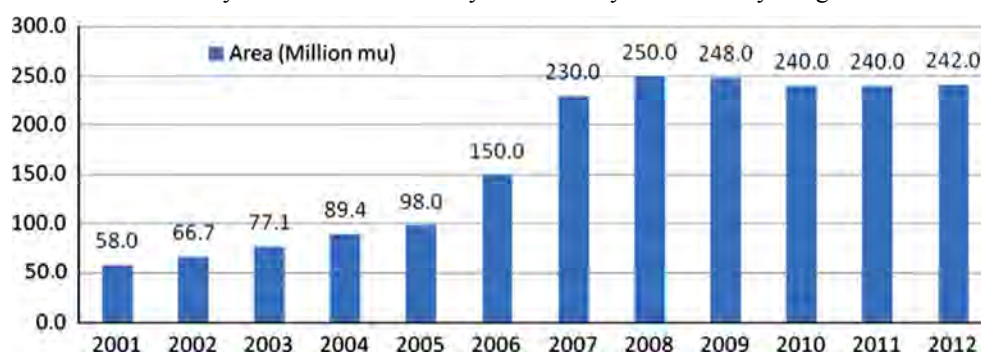
According to the stringency of standards, the certification system is made up of three levels for food production: Safe food certification, green food certification and organic food certification. In comparison with the unified international standard of organic food, the Chinese food certification system is multi-leveled and tedious.

Safe Food and Green Food are two certifications unique in China. Their certification is managed by government agencies under the Ministry of Agriculture. The Chinese government realizes that most food products in China, as a developing country, cannot reach the stringent standards of organic food

elsewhere and that it would be more practical to develop some less stringent certifications to fulfill the market demand. Though the certification of Green Food has a long history and is widely accepted by consumers in China, studies on consumer preference for it are only conducted in a very

limited way [41].

The farm land covered by green products tremendously increased from the year 2001 to 2012 (see figure 2) as the demand continuously increased and the certification process smoothly facilitated by the government.



Data source: Annual Statistical Report of Green Food (2001–2012)

Figure 2. Covered farmland of certified green food products.

The certification of Green Food can be divided into two different levels: Grade ‘A’ (allowing the use of a certain amount of chemical materials) and Grade ‘AA’ (equivalent to organic food). The Grade ‘A’ Green Food lays the foundations for the development of grade ‘AA’. However, due the intensification of the Organic Food Certification, China Green Food Development Center officially suspended the certification of Grade ‘AA’ Green Food in June 2008. Certification of Green Food is only valid for three years, and the firms should reapply for certification before the expiration.

Since the initiation of Green Food in 1989, both the numbers of certified firms and the certified products have steadily increased, however this has leveled off in recent years. It evidences that the certification market of Green Food in China is relatively mature now. In the year of 2012, China newly certified 2614 firms and 6862 products. Until 2012, a total of 6196 firms obtained Green Food certifications covering 17,125 products [41].

8. Concluding Remarks

China has recorded astonishing progress since 1960s in all aspects of development. Along with this development, Chinese organic and green food production and market has been grown. Nowadays, the demand for organic and green products tremendously increased throughout the world as income of people raised, increase in healthy consciousness and environmental protection got top priority. In addition to this, consumers’ socioeconomic factors affect the consumption of these green and organic products as per different studies conducted in China.

Chinese consumers purchase organic and green products motivated by two basic things. First, as far as inorganic products comprise different chemicals which affect health of society, some of them in the short run and others in the long run, consumers want to be safe from this consequence. Second, these days Chinese government gave considerable attention to environment protection. As a result, government promoted

green product cultivation and market. In line with this, consumers who are fundamentally environmentalist tend to use green product for the welfare of the environment.

Conflict of Interests

The authors have not declared any conflict of interests.

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