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How to feed Shanghai?

Shanghai is a hungry city. Hungry, because it has many mouths to feed, but also because the city is usurping the surrounding land. As is the case in many other megacities, a large part of agro-food production takes place in and around the city. Shanghai has therefore opted for an accelerated reform of food production, from small-scale agriculture to modern agroparks.

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The Chinese consider agroparks to be the solution to feed 'the hungry city'. An agropark is a cluster comprising agriculture, livestock farming, and sometimes even fisheries, all of which operate within one system. (Page 17. *Agroparks deal with scarcity*). Madeleine van Mansfeld from Wageningen University & Research Centre is involved in the development of Greenport Shanghai. "Because of our involvement in Greenport Shanghai, we are being approached to assist in the establishment of agroparks elsewhere in the world. We are also involved in projects in other parts of China, and in India and Mexico. It is entirely demand-driven." The scale of these projects is crucial, partly for reasons of efficiency, but mainly also because large investments are needed. Agroparks are only economically feasible when run on a sufficiently large scale.

One thousand truckfuls of vegetables needed daily to feed Shanghai

A typical wet market at Julu Road Shanghai

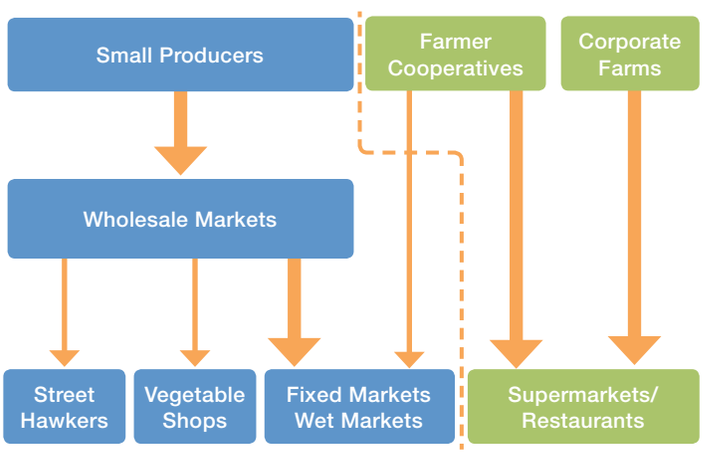
PHOTO SUNQUAIO AGROPARK

A greenhouse at Sunquaio Agropark

A glimpse at Shanghai, the fastest growing city in the world

According to the Brookings Institution, Shanghai is currently the fastest growing city in the world. The 2010 census put the total population numbers at 23 million: a country in itself. One fifth of Chinese industrial production is situated in Shanghai's surrounding areas. Both the city and its industry are rapidly usurping the surrounding space. What used to be agricultural land ten years ago has now become huge expansion areas and industrial zones.

Nine newly planned cities in the Shanghai region.

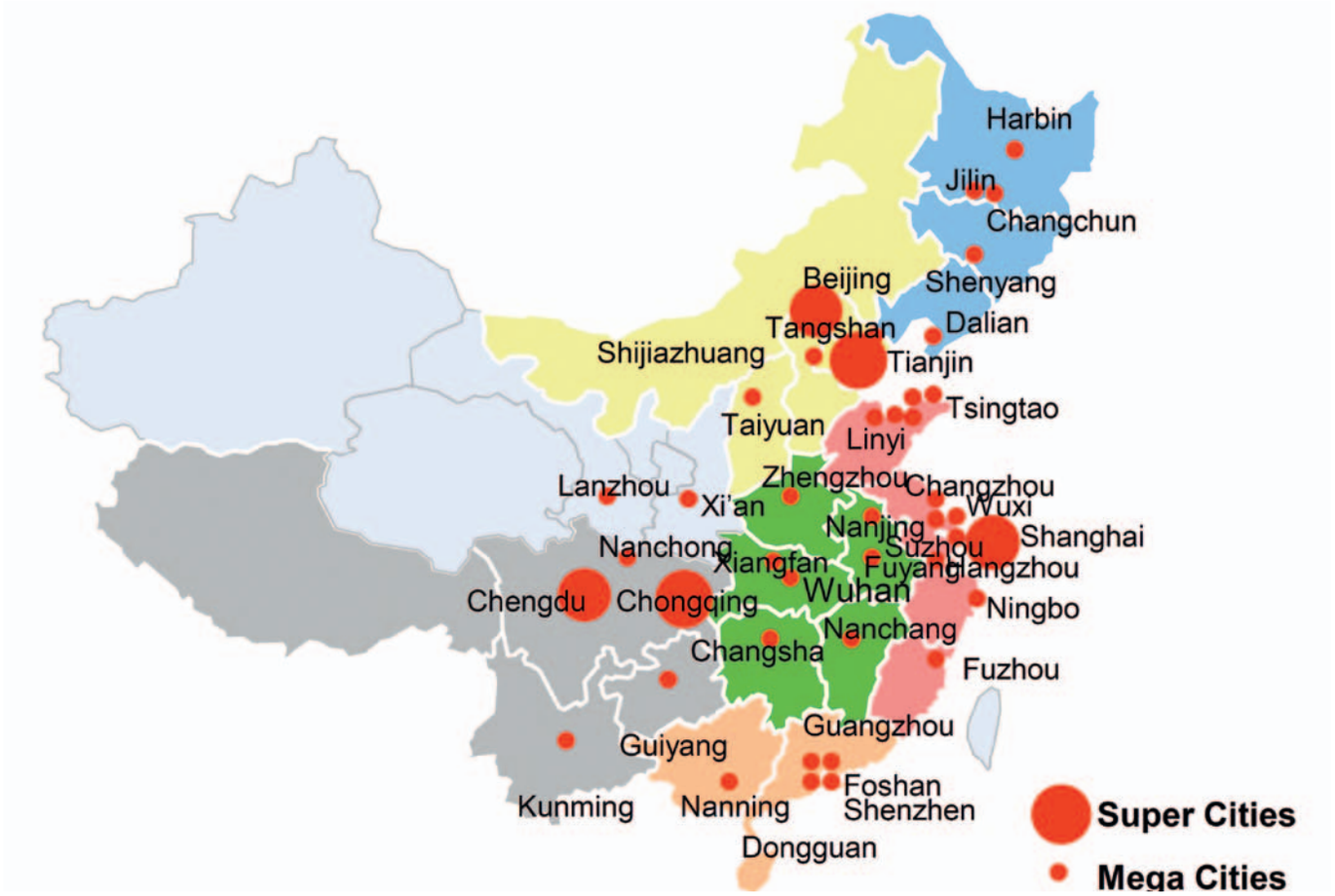


Shanghai's vegetable supply chain

It is currently estimated that 80% of vegetables come from small farmers and are distributed via ten vegetable wholesalers in Shanghai to the wet markets. On the right we see the development of large integrated chains, in which supermarkets buy directly from large producers. A government company such as Bright Food Group even partially manages a farm-to-table chain with large agriculture companies, processing industry and its own chain of supermarkets. Within these chains, it is easier to maintain food quality control. Currently, around 20% of food production and marketing takes place within this chain.

Source: Simplified diagram from Qian Forrest ZHANG, 2011

The available water is polluted from intensive use of agriculture, industry and population.



Source: Frost & Sullivan

Meanwhile, food production mainly still takes place in and around the city. Each year, Shanghai consumes about 5.6 million tonnes of vegetables, which are largely produced in the direct vicinity of the city. This equates to around one thousand truckfuls of vegetables needed daily to feed Shanghai. Efficiency, safety and ecological foot printing of food distribution clearly need to be improved in a sustainable way. This is also particularly the case for the position of producers within the chain.

According to Nick Hong, senior agrifood officer at the Dutch consulate in Shanghai, there is an emerging quality-control market. "At the moment, most vegetables still come from small farmers and are distributed via fifteen vegetable wholesalers in Shanghai to the 5,000 wet markets. However, over the last years there has been an increase in large-scale integrated chains, in which large supermarkets buy directly from large producers. A government company such as Bright Food Group even partially manages a farm-to-table chain with large agriculture companies, the processing industry and its own chain of supermarkets. "It is much easier to maintain quality control within these

The 12th five-year plan (2010–2015)

The Shanghai government's 12th five-year plan includes objectives related to the aforementioned analysis. Shanghai still needs to make the transfer to large-scale agriculture. This is mainly because until now it was able to employ a seemingly endless amount of cheap workers. But production costs are rising, less land is available, demands are going up and the workers also want their share of the new wealth. There remain few other options for the city than to become more efficient. On top of that comes the population's demand for reliable food – all the more reason for the government to quickly develop a new agricultural system.

Objectives

- **90% recycling of agricultural waste**
- **80% composition of leading agricultural enterprises and co-operations**
- **60% rise in farmers' income**
- **90% coverage of the safety and traceability system for entire food production**
- **integration of agriculture, production and trade (supply-chain integration)**
- **vegetable price insurance system, for security during reforms**

Greenport Shanghai

Greenport Shanghai was a master plan toward an entirely ecological agrocity on Chongming Island, in the vicinity of Shanghai. As master plans go, Greenport Shanghai was truly a work of art. It skillfully combined the most advanced knowledge in the fields of spatial planning, networks, ecological agriculture, integrated water management and process development. Scenery and panoramas reminiscent of Jules Verne completed the vision.

Unfortunately, Greenport Shanghai never got beyond the planning stage. The ambitious and visionary plan, drawn up in 2007, comes across as somewhat naive when read in 2012. At the same time, it would be too easy to make this judgement. Where better in the world than in China – and even more so in Shanghai just before the World Expo and the worldwide recession – could an experiment of this magnitude have taken shape?

Besides, it certainly wasn't all for nothing. The concepts and knowledge gained from the Greenport Shanghai master plan are now being applied in different parts of the world.

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China's urbanisation levels have recently exceeded 50%

chains of bigger players. Hong estimates that currently 20% of food production takes place in (green) quality-control chains. And as the City of Shanghai's last five-year plan shows, it is these kind of large companies and co-operations that will shape the future of food production in Shanghai (see 12th five-year plan Shanghai (2010-2015)).

Megacities all over the world are now rapidly expanding. They are often situated in delta areas where traditionally fertile soils are combined with a logistically practical location. What people often do not realise is that a large part of food production takes place in and around the city itself. That's how it used to be, and that's how it still is now. Because of the cities' rapid expansion in size, population and prosperity, it is becoming increasingly difficult to feed their populations. In China, traditionally an agricultural economy, urbanisation levels have recently exceeded 50%.

Shanghai faces scarcity

Shanghai, like many delta metropolises, faces scarcity. Despite the fact that the Yangtze River supplies a lot of water, the available water is polluted from intensive use of agriculture, industry and population. Fertile soils are sacrificed for urban development and economic activities that have a higher added value than agriculture. Although food production is consuming large areas, it only adds a few percent to the economy. Salaries in agriculture are going up, with an increase of 13% last year. The price of minerals such as phosphates, needed for a higher yield, is becoming higher and higher. Van Mansfeld: "China is a fast-paced and commercially oriented society with plenty of business opportunities, including in the food-supply sector. With the Chinese entrepreneurial spirit, this ensures the right conditions to earn a lot of money quickly. The costs to society have been at the lower end of the scale for a very long time."

The abuse of finite resources such as soil and water, and also humans, is not taken into account in China's attitude to food production. According to Van Mansfeld, only the consumers' recent demands for sustainable and safe food production can reverse this. If these are taken into account, a more sustainable development of the food-supply chain in China, with a more careful use of soil, water, minerals and human resources, could evolve. "This, however, requires the Chinese government to make tough choices with far-reaching consequences. It has to create the conditions needed to restore damaged resources. And on a social level, the government can build a more sustainable food-production chain by creating a more balanced distribution of power between the production, processing, wholesale and retail industries."

Growing awareness

The quality of food and food safety have become more important to the Chinese. A small avant-garde group is already focusing on ecological agricultural products, and a recent government survey showed that 90% of respondents expect the government to improve food quality control. Shanghai's government rose to the challenge in its 12th five-year plan. New ways of using water, soil, space and human capital should help to feed the Chinese cities now and in the future. ●