

Is Chinese agricultural industrialization policy successful?

Goro Takahashi¹

Abstract

The Chinese agricultural industrialization policy was started taking advantage of reform of domestic agriculture, conclusion of ASEAN and FTA, etc. The agricultural company was born, and increased and agricultural industrialization promoted the situation which farmland and farmers transfer to companies. Should we think that the Chinese agricultural industrialization policy was successful? There are many plus effects in agricultural industrialization. On the other hand, there are problems, such as water-for-agricultural-use contamination, soil pollution, aggravation of the freshness of food, and the premodern wholesale market system, in it. We cannot conclude that Chinese agricultural industrialization policy was successful at the present stage through the case study of an agricultural company. From now on, probably, agricultural industrialization should begin to solve many unsolved problems.

Keywords: Chinese agriculture, agricultural industrialization, agricultural company, organic vegetable, water pollution, soil pollution

I. Introduction

The result of the success or failure of the agricultural industrialization policy of China [1] which started around in 2000 is in the stage which cannot be concluded yet. Although this paper thinks that the possibility of a success of it is high, I point out that there are many problems which should still be examined. My case study of agricultural companies can also prove that the agricultural industrialization policy carried out many contributions to the change of Chinese agriculture [2].

In order to consider the success or failure of the agricultural industrialization policy, this paper considers the effect and points out some problems through case analysis of agricultural companies

further. And I perform the proposal for solution of many of these problems.

II. Farmers to Enterprise—Changing Chinese agriculture

1. The reason which company replaces with farmer

Chinese agricultural style has been continuing as “Small farming by contract” since economic reform policy in 1980’s after open door policy had operated in 1978. The number of small family farm is about 200 million in 2011, and the number of farmers, not rural population, is about 290 million in the same year, which is decreasing every year after the peak of 2002. The main factors of the decrease is

1) Immigration to urban area of rural young labor force,

ICCS Journal of Modern Chinese Studies Vol.4 (1) 2011
dition, China started to conclude agreements with
foreign countries for going out policy, namely
FTA and other policies of globalization [3].

China conducted some FTA agreements with
ASEAN, Chile, New Zealand, Singapore, Peru,
Costa Rica, and under negotiation is with Gulf,
Australia, Norway. Among these countries, China
focus on ASEAN as the most important partner as
for as political economy is concern. China and
ASEAN's FTA went into effect in 2010. By the
FTA, China made zero the rate of import duties of
agricultural products with ASEAN. As a result,
the agricultural products from ASEAN went into
the Chinese market in large quantities. Therefore,
it cannot be overemphasized that the Chinese
farmer suffered serious damage [4]. From before,
the prices of agricultural products hung low and
the farmer's agricultural volition was declining.

The external competitiveness of Chinese ag-
ricultural products was lost quickly. However,
this was a skillful measure for reforming the do-
mestic small-scale agriculture by the Chinese
government. The Chinese agricultural industriali-
zation policy built the new agricultural output
system which replaced with small-scale agricul-
ture, and was expected beforehand. The concrete
form is a company style agricultural system.

The company style agriculture has started to
expand from the beginning of 21century. The
number of agricultural companies in China is
about 200 thousand in 2011 increasing from
40,000 of 4 years ago[5].

Although there are several kinds of forms of
organization of the companies, it is common to
perform broad management, such as agricultural
output, processing, keeping in a refrigerator and
sale. There is an essential difference as compared
with family farming.

2) Transfer of rural work force to village and
township enterprises in the near place.

While the number of family farm and farmer
has been decreasing, alternative agricultural style,
namely enterprise style of agriculture has been
increasing in the same local area. The movement
of this new style of Chinese agriculture started at
almost the end of 1990's when Jiang Ze Min era.
The movement was promoted by so called agri-
cultural industrialization policy which was started
by Chinese central government in the mid of
1990's. The purpose of this policy was

1) Improvement of agricultural productivity
through realization of economies of scale,

2) To create a new mechanism of Chinese ag-
riculture, which is including not only agricultural
output, while adding management of the business,
transportation system, storage system, processing
technology, sale management, export business
and others are related the business.

As far as Chinese small family farming is
concern, they have a lot of problems like as too
small scale of farming and low agricultural pro-
ductivity, high productive cost, sprinkling human
waste fertilizer, agricultural pesticide contamina-
tion, low agricultural technology and so on. But
the style of agriculture of China so far certain
evolution has realized, for instance, the amount of
food especially grain production has been in-
creasing for these 30 years. The production of
grain is more than 500 million tons per year after
1998's bumper crop. Other agricultural products
for instance vegetables, fruits, nuts are also in-
creasing. Benefiting from economic development,
the diet of current Chinese has been becoming
rich and rich. This is one of the contributions to
citizens from Chinese small scale farmers.

On the other hand, the reason of reform of ag-
riculture above mentioned has to conduct. In ad-

2. The meaning of agricultural industrialization—The great transformation to a capitalistic agricultural system

The meaning of agricultural industrialization is what company manages agriculture including processing and management of food. Not only the farm management scale itself became large, but the kind of business was expanded. The kind of business was expanded from agricultural output to processing, export, etc.

Figure 1 shows that the more detailed explanation about Chinese agricultural industrialization. The triangle on the right-hand side of figure 1 shows the enterprise of an agricultural company. The height of this figure shows the grade of the scope of industrial business of an agricultural company. Ordinary agricultural companies make not only farm management but a company + farmer + base + food-processing + sale. At the end, the sold food is consumed and activity circulation completes it. The size of the area of the inverse triangle on the left-hand side of the graph expresses the active grade of an agricultural company. That is, if the area of an inverse triangle is not large, and the grade of agricultural industrialization is low, and if it is large, it is shown that the level is high.

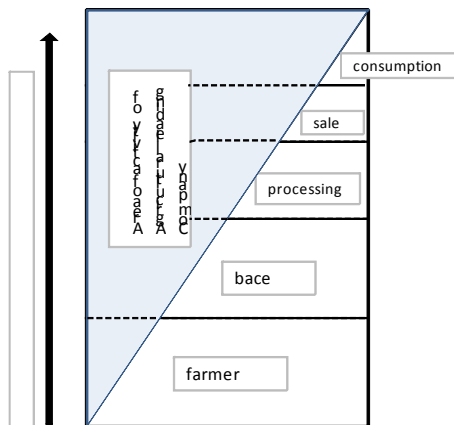


figure 1 Structure of China's Agricultural Industrialization

If such a view is adopted as a measure, the present condition of agricultural industrialization of present China is evaluated, so I can give considerable high evaluation it.

The person in charge of the China agriculture is being clearly divided into the following three systems now.

They are

- 1) agricultural company,
- 2) the small farm management of a scale, and
- 3) the comparatively big farmer management of a scale.

50% of them are company form, 40% is the small farm management of a scale, and 10% is the comparatively big farmer management of a scale. However, 50% of the small farm management of the scale which occupies 40% of the whole is carrying out contract cultivation under management of agricultural companies. Therefore, we can say that 90% of Chinese farm management is unified by corporate management directly or indirectly.

If the land ownership system was not taken into our consideration, we can say that Chinese agricultural system transformed itself from socialistic agriculture, and turned into a capitalist system. The requirements for a capitalist agricultural system are that the owner or manager of the company can fulfill the freedom of agricultural-products selection, and the freedom of sale. The Chinese company which manages the present agriculture is satisfying these requirements. However, in farmland, ownership belongs to rural group economy, and a farm management body only still has a farmland right of use for agriculture. In this meaning, the institutional substance of the Chinese agriculture is still socialistic one. Besides we have to consider that the transforming of the older agricultural style to market oriented style confront with much corruption by the rural boss.

3. The effects of integration

Chinese agricultural industrialization is equal to agricultural integration in the meaning which unifies two or more types of industry to agricultural sector. A traditional agricultural sector has an integrated economical process which from a primary sector to tertiary industry.

The company which is the farm operator object came to have the following economical effects.

- Integrated effect of a farmer's individual management (unification of management):
- Accumulation effect of land area:
- Unification of agricultural items / standardization effect:
- Reliance effect from the brand formation effect:
- Cost reduction effect:
- Unification / improvement effect of agricultural technology:
- Farmer employment effect:
- Productivity improvement effect:
- Land rent revenue effect for farmers:

(1) Integrated effect of a farmer's individual management

It is an effect which unifies the dispersed management on one management object (agricultural leading company) through unifying much small-scale farmer management. For instance, 1000 small scale farming into unify one large scale capitalist company.

(2) Accumulation effect of land area

It is an effect which integration converts into large-scale management by unifying small-scale land. Farmland of individual farmers is readjust the division of farmland and is used more effectively. And an irrigation institution of the area is

(3) Unification of agricultural items standardization effect

It is an effect which unifies agricultural output items and carries out a quantitative scale. Since Chinese family farm management is self-sustaining, small-quantity multi-item production system becomes common style. Therefore, it is subdivided by the small division and working efficiency of land is bad. Readjust the division of farmland is very effective. Unification of items is realized by readjust the division of farmland.

(4) Reliance effect from the brand formation effect

It is an effect which forms the brand in the area through realizing improvement in a scale expansion and quality. Also in the Chinese agricultural products, branding is progressing gradually. Since the consumers more than the middle class do not buy vegetables or grain other than brand goods, branding is indispensable to management strategy of agricultural companies.

(5) Cost reduction effect

It is the effect of lowering management cost through demonstrating economies of scale. The above effects gather and also are effective in lowering management cost. Since there is no incentive which reduces cost in family management, company style management is the only economic method of reducing cost in Chinese agriculture.

(6) Unification improvement effect of agricultural technology

It is the effect of realizing improvement, unification, and standardization of the agricultural

technology of a management object. Since there is no incentive which carries out technical improvement in family management, industrializing management is the only economic method of improving agricultural technology.

(7) Farmer employment effect

Since it is those who former farmers are those who offered land to the agricultural company, and lost farm land, the economic effect of employment is large for them. Since farmers lose land, they have no choice but to work in the company which they provide their farmland. If the agricultural company employs them, it becomes unnecessary to go to work away from home place, and they can make a living in the same village [7].

(8) Productivity improvement effect

The agricultural productivity of agricultural company improves through economies of scale being demonstrated and the improved technology being standardized compared with each past peasant-folk system. There are land productivity, capital productivity, and labor productivity in the definition of agricultural productivity. Land productivity is realized by accumulation of land. Improvement in capital productivity is realized by modernization and expansion of agricultural equipment. By these investments, the company can realize this. Labor productivity is realized in training and educating the employed farmer. In order to realize this, the company is creating the farmer program of instruction.

(9) Land rent revenue effect for farmers

Since land rent income goes into farmers, instead of lending land to agricultural companies, there is the increase effect in income of farmers[8].

ICCS Journal of Modern Chinese Studies Vol.4 (1) 2011
The one-year land rent per 6.7a. is the average of 500 to 800 Chinese Yuan (80-120US\$). Since one family farming has lent an average of 30a., land rent income will change to 2000 to 3200 Chinese Yuan (300-500US\$) in one year. Since land rent income does not have cost, the all become profits of the farmhouse.

III.The case study—Au Tai Kee Farm Products Processing Co.,Ltd.

One of the typical companies which is born with Chinese agricultural industrialization is Au Tai Kee Farm Products Processing Co., Ltd. (following, Au Tai Farm) which have the head office in Hong Kong. Although the head office of this company is located in Hong Kong, business of farming base is located in every place in China, and the business actual condition is the suitable case in order to study an agricultural company. Hereafter, I consider the effects of integration about the company, and analyze the subject on management.

(1) Short history of Tai Kee Farm

Mr. Ou Jingtai of the founder of Au Tai Farm was born in Guangzhou in China in 1950.His life was poor although his parents were performing small-scale vegetable dealings business. In 1960, when he was 10 years old, the family got off to Hong Kong at last. When Ou Jingtai was 25 years old, the turning point of life visited in 1975. He also imitated parents' work and began vegetable dealings. Then he performed management begun from small-scale dealings by becoming large gradually.

Table 1 shows that short history of the founder of the company. In 1985 when 10 years have passed since that time, he started an agricul-

table 1 Short history of the company

Year	Incidents
1975	Ou Jingtai created the Hong Kong Outajji Vegetable and started the agriculture business
1985	Leased 3ha land at the foot of Wutong Mountain in Shenzhen and started planting vegetables
1988	Established more than 40ha vegetable plating base in Hengli, Dongguan
1994	Invested 20 million yuan and established 100ha vegetable planting base in Shibi, Panyu, and established "Guangdong Dongsheng Agriculture Products Co., Ltd."
1995	Established "Hong Kong Outajji Agriculture Products Processing Co., Ltd." in Kowloon, Hong Kong
2001	Invested 35 million yuan and established "Outajji Agriculture Products Processing (Guangzhou) Co., Ltd." in Lingshan.
2002	Established 267ha vegetable planting base in Lingshan, Panyu, and registered the "Guangzhou Dongsheng Farm Co., Ltd."
2003	Established "Beijing Dongsheng Fangyuan Agriculture Planting Development Co., Ltd." in Tongzhou District in Beijing and the base covered more than 120ha.
2003	Invested 10 million yuan and established "Guangzhou Dongsheng Organic Planting Co., Ltd." in Conghua, and the base covered more than 100ha.
2003	Established "Shaoguan Dongsheng Agriculture Development Co., Ltd." in Shaoguan in north Guangdong
2008	Dongsheng Farm passed the provincial and national agriculture standardization demonstration examination and became national agriculture standardization base.

source: writer's interview.

tural-products processing company in Hong Kong. And the same year, he began to borrow about 3ha land in Shenzhen China to grow Chinese vegetables, and to sell it to overseas. The business is successful gradually and its volume of sales of vegetables also began to increase. As it became impossible to give satisfied demand to the markets, he began vegetable cultivation in 33ha land in Guangzhou. More over the company established more than 40ha vegetable plating base in Hengli, Dongguan province in 1988, also invested 35million Chinese Yuan(5.5MUS\$)to establish Ou Taiji Agricultural Products processing Co.,Ltd. In 2001. They established 267ha vegetable planting base as Guangzhou Dongsheng Farm Co.,Ltd.in 2002, then in 2003 they invested 10million Yuan(1.5MUS\$) to build Guangzhou Dongsheng Organic Planting Co.,Ltd. In Songhua which covers more than 100ha and they built Shangguan Dongsheng Agricultural Development Co.,Ltd.in Shaoguan city.

In 30 years, Tai Kee Farm grew up to be an agricultural leading company consisting mainly of the greatest organically grown vegetable cultivation, processing, and sale in China. Ou Jingtai obtained honor not only in Guangzhou but in the whole country as a farm management success.

The key to a success is that he concentrated management resources on organically grown vegetable cultivation, according to the safe needs of food of Chinese consumers. In the Guangzhou Asian Games (2010), the company became the main suppliers of vegetables to players and spectators who participated from each country.

The Asian games committee conducted the residual-agricultural-chemicals inspection of vegetables severely, and the company cleared all. This led the branding accompanied by the safe image of the company to the success.

The yearly turnover in 2010 of the company exceeded 100 million dollars. The company has expanded the export place of vegetables and the processed goods to Canada, Japan, South Korea, the United States, Britain, Singapore, etc. Now, it grew up to be an international food company.

(2) The organization and company group

Figure 2 shows the organization of the company. According to this figure, in the company, the group company of 12 is located by making AU Tai Kee Farm into the top head office. This figure is roughly divided into three portions. The top portion is a company in Hong Kong, seven companies in the portion of middle are companies which are performing cultivation, processing, sale, etc. in mainland China, and the bottom portion is companies which do not do cultivation but makes processing a specialty. The company which proc-

esses it makes a specialty work which processes the raw material supplied from the companies which do vegetable cultivation.

Seven companies which do vegetable cultivation are located in large consumer cities of vegetables, such as Hong Kong, Guangzhou[9], and Beijing. The purpose of management is to expand market to the oversea market where the demand of organically grown vegetables is large, besides supplying vegetables to these domestic large consumer cities.

When considering the enterprise group of the company, some important points which are common in the agricultural company become clear.

- There is no company which performs only cultivation of vegetables. Most companies unite and make processing, storage, and a sale.
- In order to collect lands on a large scale, establish farms in many places exceeding Provinces[10].
- As for the company which performs large-scale farm management, it is common that the founder of management is an individual, and the company is not an exception, either.
- It is common to prepare two or more farms. However, the company has prepared at least one place for the large farm (in the case of the company organic farm in Guangzhou) used as a base.
- Management strategy is clear that they have a promoting differentiation of agricultural products and processed goods etc.

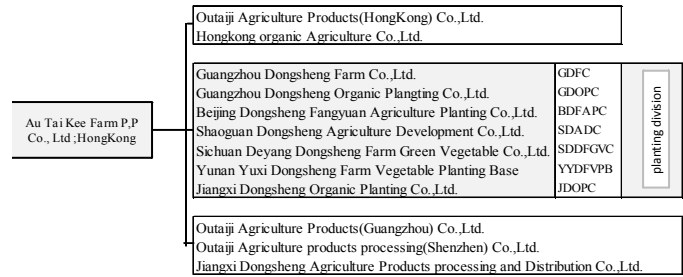


figure 2 structure of Dongsheng Farm group

(3) Outline of Business of the group

Table 2 shows that outline of business of Au Tai Kee Farm group. The method of the agricultural business of the company is not company itself, and includes a farmer's land and the labor force in the farm called a base. By legal regulation, although a company can have a farmland royalty, the company itself cannot reclaim land in China with little land. Therefore, the way of a company concentrates farmer's farmland royalty is adopted. There two cases, one is farmland royalty transfers to a company, and other one is a royalty does not transfer.

In the case of the company, these two cases exist about farmland royalty system. The area of the farmland royalty which the company has independently amounts to total of 1016ha of the seven companies. And farmer's farmland royalty area which the company borrows is 667ha. This 667ha farmland belongs to GDFC. The farm pays 1200 Yuan (185 US \$) of land rent per year to 6.7a. Therefore, if it totals, the company has paid the land rent of 1.8MUS\$ in one year. The part of the land rent contributes farmers to the increase in income. Moreover, since a farmer is employed by the company and has an income of an average of 6 US\$ per day, if an annual working day is made into 250 days, he has got the income of 1500 US\$ or more. In addition, the wages of 6 US\$ per day are a little low level as farm labor force.

ICCS Journal of Modern Chinese Studies Vol.4 (1) 2011 by which residual agricultural chemicals are not detected from all products[11]. Therefore, the company installs modernistic and large residual-agricultural-chemicals inspecting rooms, employs special engineers, always inspects, and is performing computer management. The situation of an inspection is exhibited, and the data of test results also makes booklets and are exhibited in a facility of the company.

Since the average income of a farmer of this district is 930 US\$ per year, even if it removes a land rent income, it is 1.6 times the income level of this. Thus, as a result of agricultural industrialization, the farmer also increased the income earning opportunity and has got the benefit of the substantial increase of acquisition. Since the number of the farmers whom the company has employed at the same time is seasonal migrant labor, it is unstable, but at least 1000 or more persons are conjectured in the seven company sum totals.

Therefore, the total payment wages amount for one year for the company is about 1.5MUS\$, and is a labor expense burden which is not few.

Capital institution equipment of the company is modernistic and has the refrigerators of agricultural products besides farms, green houses, freezers, large size container tracks with Hong Kong and the Macao transportation permit, vegetable processing equipments and warehouses, residual-agricultural-chemicals inspecting rooms, etc.

They have about 50 cultivation items. The main items which disregarded seasonality are tomato, lettuce, Chinese broccoli, Chinese green soybean, corn, Chinese cabbage, Chinese green cabbage, Naibai cabbage, Douhai cabbage, bean, sweet potato, bitter gourd, eggplant, green pepper, sugar pea, string bean, loofah, cucumber, carrot, radish, leek, onion, spinach burdock, garlic, burdock root etc.

(4) Concentrating management resources on organic crops

The management strategy of the company manufactures organically grown vegetable cultivation and quality processed foods, and is conducting strict agricultural-chemicals inspection,

table 2 Business outline of the Company (as of 2010)

foundation	style	land (ha)	company's integrated (farmer's)	facilities	employee	processing	sale	export	products
GDFC	2002	campan base+ farmer	200	667	green house -refrigerator	100/day	20MS		Chinese beecock Chinese green soybean Corn
GDOFC	2003	campan base+ farmer	133		green house -refrigerator -sprinkler -chemicals inspection		372/year	1.7MS	Chinese cabbage Chinese green cabbage Naibai cabbage Douhai cabbage Bean
BDFAPC	2002		400		green house -refrigerator	165 60/day	30MS	9.8MS	Sweet potato Bitter gourd Eggplant Tomato
SDADC	2003	comapa technology	130		green house -refrigerator				Green pepper Sugar pea String bean
SDDFGVC	2006		73		green house -refrigerator	270		0.23MS	Loofah Cucumber Carrot
YYDFVPB	2001		13		green house -refrigerator	70			Radish Leek Onion
JDOFC	2009		67		green house -refrigerator	10/day			Spinach Burdock

source: writer's interview

An investment for that is investing a large sum also in several million Yuan(several 100 thousand or more), and the education and training for the specialist for maintaining the safety of food. If the agricultural company does not raise the image that it is severe about the safety of food, according to raising of the safety consciousness about consumers' food, it is impossible to develop a sales track record. Since the company had assigned the head office in Hong Kong, it was able to become sensitive earlier to change of civic eating habits [12].

And the company rode on the wave of change of the China society, developed achievements till today, and has succeeded in the expansion of the company. It can say the result in which the company has concentrated the management resources consisting mainly of fund, talented people, farmland, Management publicity etc. for organically

grown vegetable production, processing, and inspection institution construction.

Moreover, the local government has supported fund, land accumulation, market expansion, etc. in the factor of a success of the company. Probably, the company was not able to concentrate management resources on these without the supports.

IV. Discussion

About the economical effects of agricultural industrialization, I already pointed out above. Finally, I can extract the problems which should improve through actual condition analysis of a Chinese agricultural industrialization policy and an agricultural corporate management objects. Hereafter, I perform consideration which focused on this point.

(1) Improve a relation with a farmer and create a stable system with companies

In many agricultural companies, although the relation between a farmer and a company has become like the general manufacturing industry, but normal management labor relation is still not built. In some companies, there is the actual condition that the farmer has received treatment like a peasant by the company which offered his farmland royalty. A required thing is that a company and a farmer build a stable relation in an equal position, and the local indifferent organization which should be built should perform instruction to companies. And the farmer itself needs to try hard to free himself from old peasant-folk consciousness. For that purpose, the companies and the local government are united and it is necessary to increase the educational opportunity to

ICCS Journal of Modern Chinese Studies Vol.4 (1) 2011 farmers. So that the productivity will may increase also [13].

(2) Freshness maintenance of products and the improvement of the wholesale markets and consumer markets access

As for Chinese fresh vegetables, there is a problem in physical distribution functions, such as un-fixing of a cold chain system. Therefore, the Chinese government announced in June, 2010 that not less than 20% has rotted during transportation or storage. This point is applied also for many agricultural companies.

According to my field survey, the refrigeration facilities of many agricultural companies are outdated, and a track and its container are also outdated. If this point is not improved from now on, the safety of the organically grown vegetables or the processed foods will be threatened.

(3) Pollution control of water for agricultural use, and soil pollution prevention

China water for agricultural use continues running short every year, and, moreover, its groundwater dependence is high [14]. In the agricultural area of the central part and a western part, suspension of water supply every day, and is lifting water with the pump from 200m of underground. And a domestic waste, agricultural waste water, and also industrial waste water are polluting groundwater [15]. The influence by contamination of human manure is especially great.

The methods of preventing contamination of water for agricultural use are advancing the spread of flush toilets to rural society, forbidding human manure, and advancing purification of domestic waste or industrial effluent strictly.

The cause of contamination of soil has clarified. Agricultural chemicals use too much, a

chemical fertilizer uses too much, and it is lack of an organic fertilizer. According to my soil observation, the soil of the farmland in China is hard, there is little oxygen, there are few benign microbes, and there are many harmful bacteria. In order to solve this problem, you should adopt the method of continuing throwing the high manure of an organic matter into farmland by mixing farmland agriculture and livestock agriculture in the same area.

(4) Prohibition of the PET bottle refrigeration under transportation and sale

Since China's area is large, the transportation distance of vegetables is long and they require time. In addition, the latest highway is congested with cars and, usually it takes three to four days from a place of production to consumer places. But, since there is no equipment of transportation system of refrigerated food instead, the present condition is the company's having cooled the PET bottles into which put water, having made it ice, and having put about ten of them on the bottom of the box of vegetables(see picture: photo by Takahashi,2011at Guangzhou). This method delays modernization of equipment of transportation system of refrigerated food (so-called "cold chain system"), and deceives the weight of vegetables and food. Since PET bottles are under a box in many cases, nobody can discover it.



Cooling of the vegetables by PET bottles induces not only the problem that deceives weight but the humidity inside a track, and bacterial breeding, and there is a sanitary problem. It is necessary to strengthen the eye of the authorities' surveillance to such a method. Probably, the authorities should forbid the ice of the PET bottle, if surveillance system is not made.

V. Conclusion

Chinese agricultural industrialization is progressing with rapid vigor. The company not only treating agricultural-products production but processing, storage, and sale was born.

As a result, birth of agricultural companies continues and the centralization of farmland and farmer's enclosure by agricultural companies are progressing. Modernization of Chinese agriculture progressed and improvement in productivity, improvement in the safety of agricultural products, and branding of agricultural products and processing goods progressed.

However, agricultural companies have many problems which also arisen. There are many issues which should be corrected. For example, they are construction of the normal relationship between companies and farmers, the improvement of the market access of agricultural products, prevention of water and soil pollution, abolition of agricultural-products cooling on PET bottle ice, etc.

We conducted the above macroscopic and micro analysis, and reached the conclusion that we could not conclude yet that the Chinese agricultural industrialization policy was successful.

Footnote*

¹ Director, Professor, International Center for Chinese Studies, Aichi University, Japan
E-mail: takaha@vaga.aichi-u.ac.jp

***References**

- [1] Shao xi Wu et al. A study on agricultural industrialization and expansion of the technology of leading company. *Scientific technology and education*,4: 87-89. 2011.
- [2] Qihao Weng. Land use change analysis in the Zhujiang Delta of China using satellite remote sensing, GIS and stochastic modeling. *Journal of Environmental Management*, 64: 273-284. 2007.
- [3] Huanguang Qiu. Impact of China-ASEAN Free Trade Area on China's International Agricultural Trade and Its Regional Development. *China & World Economy*, 4(5): 77-90. 2007.
- [4] Goro Takahashi. The need of East Asian Agricultural Community and the Framework. *Agriculture and Agricultural Science Procedia*, 1: 311-320. 2010.
- [5] Goro Takahashi. *Transforming of Chinese Economy and Agriculture*. Japan Economic Critique Publisher. 2008.
- [6] Goro Takahashi. Industrialization of Chinese agriculture and domination to farmland by agricultural company. *Toa*, 3: 20-27. 2009.
- [7] Jacob Eyferth et al (eds). *Rural Development in Transitional China: The New Agriculture*, Routledge. 2004.
- [8] Shujie Yao. *Economic Growth, Income Distribution and Poverty Reduction in Contemporary China*, Routledge. 2005
- [9] Huansheng Chi. A analysis on the development of modern agriculture in Guangdong. *Southern Village*, 6: 53-55. 2010.
- [10] Zhang han lu jie. A study on influence to accumulation of Agricultural industry. *Agricultural Technology and Economy*, 2: 85-91. 2011.
- [11] Tain Shi et al. Developing effective policies for the sustainable development of ecological agriculture in China: the case study of Jinshan county with a systems dynamics model. *Ecological Economics*, 53: 223-246. 2005.
- [12] Klaus Hubacek et al. Economic and social changes in China and their Effects on water Use. *Journal of Industrial Ecology*, 9: 187-200. 2007.
- [13] Shenggen Fan et al. Production and Productivity Growth in Chinese agriculture: New National and regional Measures. *Economic Development and Cultural Change*, 4: 819-838. 2002.
- [14] Biao Huang et al. Environmental Assessment of small-scale vegetable farming systems in peri-urban area of the Yantze River Delta region, China. *Agriculture, Ecosystems & Environment*, 112: 391-402. 2006.
- [15] Amelia Blanke et al. Water Saving technology and Saving water in China. *Agricultural Water Management*, 86: 139-150. 2007.

(Acceptance, Sept., 2011)