RESEARCH INTEREST

NORTHEAST ASIAN AGRICULTURE: COOPERATION OR COMPETITION?

CHOI SEI-KYUN*

Key words
Northeast Asia, FTA, negotiation, cooperation, structural change, competitiveness, trade facilitation.

Abstract
This paper focuses on the role of the agricultural sector in achieving regional integration in Northeast Asia. Competition between Korea and China in the Japanese import market is increasing. China's agricultural export has significantly increased at the expense of domestic producers in Korea and Japan. All the three Northeast Asian countries have experienced similar structural changes in agriculture, with each country moving towards land saving, and labor or capital intensive farming. They have observed an increase in the share of products with high income elasticity. Each country tries to increase its export of horticultural and small animal products.
This paper suggests possible ways of achieving agricultural cooperation in Northeast Asia, while competing each other at the same time. Each country's role in agriculture (i.e. China as a source of food security in the region and a leading exporter, and Japan as a facilitator of trade through import) is stressed. Negotiations over loose form of economic integration are strongly required as a stepping stone for further economic integration to discuss agricultural issues such as trade facilitation, e.g. standards, labeling, customs procedures/ administration and economic and technology cooperation. The terminology of negotiation or bargaining, though not friendly to those in the losing sectors, is similar to the meaning of cooperation based on competition.

* Research Director, Korea Rural Economic Institute.

I. Deepening Regionalism and Reaction of Northeast Asia

1. Global Regionalism and Reaction of Northeast Asia

Recently, countries around the world are accelerating regional economic integration. The integration of European countries (The EU has expanded to have 25 member countries.) and the development of the NAFTA to the FTAA (Free Trade Area of the Americas, 34 countries) signify that the two axes of the global economy such as Europe and the America are forming a more closed regional economic bloc in each region. It is expected that the consolidation of East Asian countries which form another core of the global economy will strengthen in response to this trend.

Northeast Asian countries such as Korea, China and Japan have been unaffected by this regionalism trend. However, recently Northeast Asian countries are actively pursuing Free Trade Agreement (FTA) negotiations to respond to the global regionalism trend. After Korea concluded an FTA with Chile, it is negotiating with or has signed preliminary agreements with over 20 countries around the world.

After Japan concluded an FTA with Singapore, Japan has been actively pursuing FTAs with Korea and ASEAN countries such as Thailand. In particular, Japan's FTA with Korea has a great economic effect on both countries and Japan is showing a very aggressive attitude since it is expected that apart from economic aspects, it will greatly contribute to resolving the historical and national sentiment-related issues between the two countries as well as the concerns about Japan's past historical issues and hegemony in East Asia. The FTA with ASEAN countries also signifies the attempt to strengthen economic cooperation with Southeast Asian countries apart from economic interests.

China's FTA with ASEAN has started with tariff reductions from 2005 and is expected to create a Free Trade Area with 6 ASEAN countries by 2010 and with 4 other countries by 2015. China had a great interest in the Korea-Japan FTA and is showing an active interest in the tripartite FTA among Korea, China and Japan, while keeping an eye on the changes in the dynamics of the discussions for the Korea-Japan FTA. (At the 2003

ASEAN+3 Summit, Chinese Prime Minister Hu Jin Tao proposed a joint research for economic cooperation between the three Northeast Asian countries.)

China is strengthening economic cooperation through the FTA with ASEAN as an opportunity, and against these movements, Korea and Japan are hurrying to conclude FTAs for economic cooperation with ASEAN countries.. These movements will help economic cooperation in East Asia. When the East Asian region forms an economic bloc, the global economy can be reorganized into a three-axis structure.

2. Cooperation and Competition

The strengthening regionalism around the world is raising the need for cohesion in the Northeast Asian region. The often cited method of emphasizing cohesion is "economic cooperation." In this framework, many researches have been carried out, but the visible results are coming very slowly in only limited areas. The issues we should consider are to find out the meanings of "Economic Cooperation in Northeast Asia" and "Northeast Asian FTA."

The dictionary definition of cooperation is "gathering power with the intention of helping one another." The EU is the leader in regional community. The EU started from a regional trade agreement which had a loose form and then developed into a community and union or alliance. A regional trade agreement develops into a union or an alliance through the stages of liberalizing commodity trade and human resources, carrying out joint economic policies, and strengthening the cooperation in non-economic areas such as diplomacy and security. In order for the economic cooperation of Northeast Asian region to become more concrete, we need to find a way to start from a free trade agreement which is the initial stage of forming a regional community just like the path the EU has taken, and then gradually strengthen cohesion. However, the regional community starts from the concept of cooperation till we cannot deny that the dominant factor in the formation of a regional community is "competition."

Competition means "fighting with each other to advance or to win." In case of an FTA which is the early form of a regional trade agreement, an FTA is initiated for economic cooperation. But, ultimately, there is a hidden

strategy to pioneer the market of the other country based on a country's comparative advantage. Theoretically, free trade has a positive aspect of enhancing the welfare of both countries. However, when we look at the regional trade agreements that have been concluded so far, it is rare that both countries have opened the markets in all areas. The basic strategy of the FTA negotiations is to protect the weak industries of one's own country and to increase the exports of competitive industries. Of course through the mutual market opening, the goal of "cooperation" may be achieved ultimately through the enhanced welfare state of both countries. However, it is also true that cooperation and competition are the concepts which should be differentiated.

Cooperation or negotiation, or bargaining, refers to the type of activity where the interests are met from the aspects of cooperation and competition strategically to enhance one's own interest. Negotiation means the process of making compromises between two or more parties based on the understanding of differences in opinion and, through negotiations, the relevant parties enhance their common interests and make compromises on opposing positions. Although we use the concept of "economic cooperation" very often, we should think about whether it can be used like the concept of "negotiation" or "competition."

One way to create the regional community of the Northeast Asian region is to deepen the regional trade agreement. To realize this, there are some ways such as three FTAs can be made among the 3 Northeast Asian countries at the beginning, and then the trilateral FTA can be executed in the next stage or there can be immediate signing of the trilateral FTA. Currently, the negotiations for the Korea-Japan FTA have been under way, and the trilateral FTA talks among Korea, China, and Japan have begun, too. One of the biggest obstacles to the Northeast Asian FTA is the agricultural issues of Korea and Japan. In Korea and Japan, agriculture is classified as a weak industry, and both countries are very passive in opening their agricultural markets. China will try to make up for its weakness in the manufacturing sector partially through the agricultural area and will exert great pressure on the opening of the agricultural markets of Korea and Japan. It is assumed that the beginning for the realization of the Northeast Asian regional community is already in a framework of "competition" or "negotiation" rather than "cooperation." If the Northeast Asia FTA has the concept of economic cooperation, then the fear

and opposing opinions against market opening would not be as fierce as it is now.

This paper will analyze agricultural trade structure in order to find out the competing or complementary relationship in the Northeast Asian region and then the farming structure changes will be analyzed to foresee the Northeast Asian agricultural trade.. Then policy recommendations will be proposed for Northeast Asian economic cooperation or regional integration in this region.. Finding a way which starts from the concept of mutual competition but which can improve the welfare of all the countries negotiating to realize "cooperation" will become a very important starting point in realizing the Northeast Asian community.

II. Agricultural Trade Structure in Northeast Asia

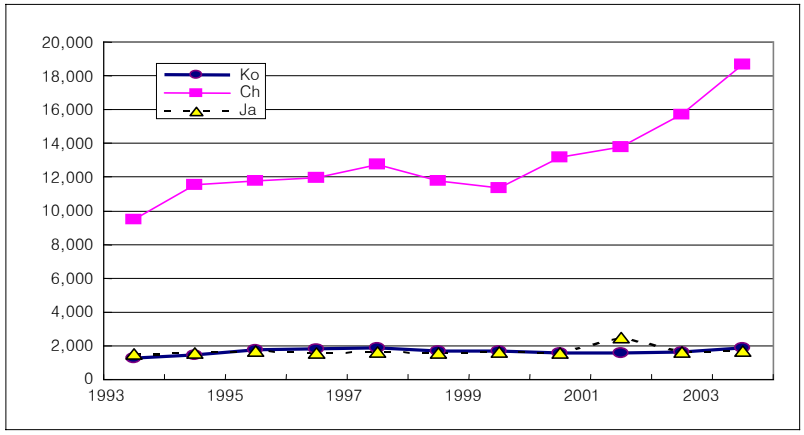
1. Trade Changes

The China's agricultural export growth is twice as much as that of Korea, and the Japan's growth rate is also higher than that of Korea. The agricultural exports of Korea and Japan have shown gradual growth, but are still below 2 billion dollars. However, the farm export growth rate of China is very high, and in particular from 2000, the growth rate is remarkably increasing.

Accordingly, the changes in the agricultural exports of the three Northeast Asian countries have been led by China, and the competition relationship and the degree of conflicts surrounding the farm product trade will be determined by what markets the Chinese farm exports will head for. For the recent 5 years (1999-2003), the market share of imported Chinese products in the Japan's farm and fisheries market increased from 10.9 percent to 13.2 percent. On the other hand, the market share of Korean farm products in Japan went down from 3.5 percent to 2.3 percent during the same period. We can see that China and Korea are deepening competition surrounding Japan, which is one of the biggest farm product importing countries, and the competition with Japanese domestic suppliers is also heating up.

FIGURE 1. Agricultural Export of Korea, Japan, and China

Million US $

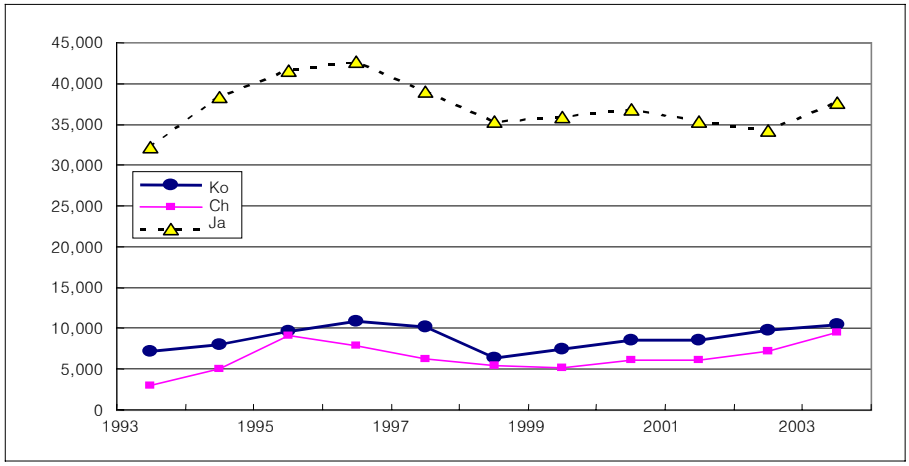


Source: Korea Marketing Corporation of Agriculture and Fisheries, (www.kati.net)
China Statistical Bureau, 『China Statistical Yearbook』, 2004.
Japan Ministry of Finance, 『Yearbook of Trade』, various years.

The increase rates of the farm product import by the three Northeast Asian countries during 1993-2003 was 44 percent for Korea, 220 percent for China and 10 percent for Japan. The import of farm products in Japan has been decreasing from the mid-1990s. This phenomenon is because the demand for Japanese farm products in areas other than fruits and dairy products has been in a standstill or decreasing in most areas. Accordingly, it will be difficult to expect the import to increase in Japan before their farm product market is additionally opened up. Therefore there is a high possibility that Korea and China will deepen their competitive relationship for the stalled Japanese import market. However, since China's farm product import growth rate is two times higher than its export increase rate, China's power to export is expected to decrease gradually. There is also a high possibility that China will specialize in the export and import of particular products.

FIGURE 2. Agricultural Products Import of Korea, Japan, and China

Millions of US $



Source: Korea Marketing Corporation of Agriculture and Fisheries, (www.kati.net)
China Statistical Bureau, 『China Statistical Yearbook』, 2004.
Japan Ministry of Finance, 『Yearbook of Trade』, various years.

2. Intra-Regional Agricultural Trade in Northeast Asia

The farm product trade in Northeast Asia shows a chronic deficit, and the amount marked 30 billion to 45 billion US dollars between 1993 and 2003. This trade deficit is caused by the fact that the self-sufficiency rates of farm products in Japan and Korea are very low. In order to increase the farm product self-sufficiency rate in the Northeast Asian region, the role of China is relatively important. But the self-sufficiency rate of food in China is decreasing and their import growth rate is higher than the export growth rate. So there is a low possibility that the food self-sufficiency rate will go up in this region without significant policy changes.

The agricultural trade for the three Northeast Asian countries in 1995 were 15.2 billion US dollars of exports and 6.1 billion US dollars of imports, 40 percent of which was intra-regional trade. The intra-regional export ratio was 48 percent (8.6 billion US dollars) in 2001; 39.6 percent (8.8 billion US dollars) in 2003; and is currently increasing. The ratio of intra-regional import

was 10 percent in 1995. It marked 17 percent in 2001 and 15 percent in 2003, and it is still increasing. When it comes to the agricultural product export amount, China's figure is the highest, which is 10 times that of Korea, and 5 times the combined figures of Korea and Japan.

The characteristic of the farm product trade among the three Northeast Asian countries is that Korea and Japan are classified into one group as net food importers while China is classified into another group as a net food exporter. China is increasing the export of farm products and its role as a farm product supplier to both Korea and Japan will become more prominent as import demand increases due to the opening of the Korean and Japanese markets. One characteristic of the Northeast Asian farm product trade is that in 2003 after the farm product imports had reached their height, the imports of farm products recovered to the 94 percent level of 1996 i.e.. before the financial crisis. Agricultural imports in the Northeast Asian region will increase as market opening in Korea and Japan progresses. In this process, the conflicting or cooperative relationship regarding farm trade will be established according to what China wants to export and what Korea and Japan want to import.

The proportions of Chinese and Japanese farm products in the Korean market are gradually increasing, and the proportions of Korean and Japanese farm products in the Chinese market are also increasing. However, the proportions of Korean and Chinese farm products in the Japanese market, which is the biggest import market, are gradually decreasing. In order to enhance the self-sufficiency rate of agricultural products and trade in the Northeast Asian region, there is a need to increase the market share of Korea and China in the Japanese market given the importance of Japan in the intra-regional agricultural market. We will be able to find a way to cooperate in the farming sector in Northeast Asia while expanding these discussions.

TABLE 1. Agricultural Trade for Korea, Japan, and China

Millions of US $

Year	Korea		China		Japan		Total	
	export	import	export	import	export	import	export	import
1993	1,263	7,269	9,505	2,953	1,487	32,194	12,255	42,416
1994	1,463	7,989	11,512	5,014	1,601	38,321	14,576	51,324
1995	1,747	9,677	11,778	9,131	1,722	41,661	15,247	60,469
1996	1,829	10,940	11,949	7,866	1,564	42,637	15,342	61,443
1997	1,853	10,231	12,771	6,308	1,633	38,964	16,257	55,503
1998	1,683	6,436	11,795	5,458	1,557	35,385	15,035	47,279
1999	1,715	7,459	11,361	5,194	1,660	35,934	14,736	48,587
2000	1,559	8,527	13,143	6,099	1,564	36,851	16,266	51,477
2001	1,600	8,591	13,761	6,151	2,485	35,376	17,846	50,118
2002	1,653	9,807	15,703	7,250	1,646	34,299	19,002	51,356
2003	1,870	10,501	18,665	9,450	1,690	37,689	22,225	57,640

Source: Korea Marketing Corporation of Agriculture and Fisheries, (www.kati.net)
China Statistical Bureau, 『China Statistical Yearbook』, 2004.
Japan Ministry of Finance, 『Yearbook of Trade』, various years.

TABLE 2. Intra-regional Agricultural Trade

Millions of US $

exporters \ importers		Korea			China			Japan		
		1995	2001	2003	1995	2001	2003	1995	2001	2003
Korea	agriculture				412.5	846.1	1,725.5	236.3	157.6	166.7
	livestock				35.2	32.3	38.5	14.6	38.2	39.0
	forestry				189.5	232.8	297.6	41.9	11.5	8.6
	total	-	-	-	637.2 (5.4)	1,111.2 (8.6)	2,061.6 (11.0)	292.8 (17.0)	207.3 (8.3)	214.3 (12.7)
China	agriculture	44.9	68.4	116.8				88	84	151.6
	livestock	1.1	3.8	3.3				-	80	-
	forestry	49.3	36.5	46.0				5	62	4.7
	total	95.3 (5.5)	108.7 (6.9)	166.1 (8.9)	-	-	-	93* (5.4)	227 (9.1)	156.3* (9.2)
Japan	agriculture	320.1	474.2	536.7	2,593	3,189	4,405			
	livestock	136.5	29.2	26.9	854	2,150	-*			
	forestry	388.8	135.0	93.9	689	955	1,159			
	total	845.4 (48.4)	638.4 (40.4)	657.5 (35.4)	4,136 (35.1)	6,294 (48.9)	5,564 (30.0)	-	-	-

Source: Eor et. al. (2004, 2003)

3. Intra-Regional Export Competition

The farm products that the three Northeast Asian countries are interested in for trade are mostly fresh products. In the case of processed foods, the trade of processed food, compared with fresh farm products, does not have much effect on agriculture in Korea and Japan where the proportion of domestic farm products utilized for making processed food is low. Accordingly, we will analyze the export competition relationship of the three Northeast Asian countries centered on the products which are fresh products or some fresh products which are to be directly related to fresh farm products (i.e. processed vegetables and fruits etc.) among the products that are classified as farm products according to the HS Classification table (HS 1 to 24 excluding 3, etc.). Accordingly, the products we wish to analyze here are the farm products classified as HS 1, 2, 4~13, and 20. Here we have analyzed HS 4 digits for convenience.

Grains are included in HS chapter 10. There is no Korean grain exported product which is in top 20 and one rice product of Japan is ranked in top 17. However, rice export of Japan cannot be seen as commercial export since most of them are for aid. On the other hand, corn and rice are ranked the first and the fourth respectively in China's export, and the export of wheat is in top 18, so China is playing a role as a grain exporter. Korea and Japan are large importers of grain and only China in the Northeastern Asian region is responding to the demand for imports by Korea and Japan. The role of China as a grain supplier has an important meaning for the balance of farm product trade in Northeast Asia, and this function should be strengthened.

Livestock products mostly fall into HS chapters 2 (meat) and 4 (dairy products). Korea's pork exports are in the 16th place among agricultural products exported. Japan does not have a livestock product which is in top 20 exported items. On the other hand, China's poultry and pork exports are respectively in 10th and 17th place. Accordingly, Korea and China are competing in terms of pork export. China is a large poultry exporter, but in the case of some processed products, there is a possibility that it will form a competitive relationship with Korea. It is estimated that there is no country which will become a supplier of beef and dairy products in this region. Accordingly, the characteristic of the livestock product trade in the Northeast Asian region is that Korea and China have a competitive relationship in the Japanese market and that China plays supplier role in the poultry market. For beef and dairy

products, this region will rely on outside the region.

Vegetables are mostly in HS chapter 7. Korea has three vegetables in top 20 exported items, so Korea is the most competitive in this area among agricultural products. China has 4 vegetables in top 20 exported items, so their global competitiveness in vegetables is high. Excluding the root vegetables such as starch, Japan has no product included in the top 20 exported items. The intra-regional trade in the Northeast Asian region in the case of vegetables is showing the structure that Korea exports to Japan, and China exports to Korea and Japan. Korea and China are expected to compete more in the Japanese vegetable market. China, on the other hand, is increasing its market share in the Korean vegetable market, so the Korean and Japanese producers have a sense of crisis about China's vegetable exports.

Fruits are mostly in HS chapter 8. Korea exports chestnuts, apples and pears, and they account for a high proportion of total export, so there are 2 products (one fot chestnuts and the other for apples and pears combined) which are included in top 20 exported items. In the case of Korea, the export of tangerines, other fruits, and frozen fruits are in top 30, so we can see that the proportion of fruits in farm product export is comparatively high compared to other products. Japan's apples, pears and tangerines are in top 20. Although China is a large-scale exporter, China's fruit export is not relatively active. Among its exported fruits, only one product (apples and pears) is included in top 20. Accordingly, the trade of apples and pears in the Northeast Asian region is the area competed by three countries, and the competition in tangerine trade is expected to be heated. Other than that, in chestnut trade, Korea and China are competing in the Japanese market.

Floricultural products are mostly in HS chapter 6. Korea's cut flowers and plants are in top 20, so it is an area where a high proportion of floricultural products is exported. On the other hand, China does not have a single floricultural product exported, which is in top 20. Japan's plant exports are in top 15. Accordingly, Korea has the highest competitiveness in the cut flower export among the three Northeast Asian countries. The intra-regional competition structure in Northeast Asia in floriculture products is looser compared to other farm products. Korea currently serves as a main floricultural exporter in the Northeast Asia, and this role will be influenced by the development of the China's floricultural industry.

TABLE 3. Top 30 Exported Items of Korea, China and Japan (HS 4 digit, 2003)

Unit: %

Rank	Korea		China		Japan	
	HS#	share	HS#	share	HS#	Share
1	2106	5.7	1005	11.5	2103	11.5
2	2005	5.0	2008	4.6	2106	10.6
3	1212	4.7	1006	3.2	1209	5.7
4	0709	3.4	0703	3.0	1101	5.0
5	0802	3.4	0712	2.9	0808	2.6
6	2103	2.9	2005	2.8	2101	1.5
7	1302	2.3	0504	2.6	2104	1.4
8	0808	2.0	0902	2.4	1302	1.3
9	2101	1.7	0713	2.3	2102	1.2
10	1211	1.7	0207	2.1	1212	1.0
11	0603	1.5	1202	2.1	2005	0.9
12	0602	0.9	2106	2.0	0902	0.9
13	1209	0.8	2003	2.0	0714	0.8
14	0505	0.8	0710	1.9	2008	0.6
15	1108	0.8	0808	1.9	0602	0.6
16	0203	0.7	2009	1.9	0910	0.4
17	0712	0.5	0203	1.7	1006	0.4
18	2003	0.4	1001	1.7	2009	0.3
19	0702	0.4	1212	1.5	0511	0.3
20	2105	0.4	0505	1.5	0805	0.3
21	0904	0.3	1211	1.5	0712	0.3
22	0403	0.3	0103	1.4	2105	0.3
23	1101	0.2	2002	1.4	0106	0.2
24	2008	0.2	0709	1.3	1108	0.2
25	0805	0.2	0711	1.1	1211	0.2
26	0810	0.2	2103	1.0	0101	0.2
27	0902	0.2	0802	1.0	0207	0.2
28	0707	0.2	0904	0.8	0802	0.2
29	0811	0.2	1207	0.7	0202	0.2
30	2009	0.2	0706	0.7	2001	0.1
Cumulative		42.4		66.3		49.5

Source : KITA(www.kati.net)

III. Structural Changes and Deepening Competition in Agriculture

The farming structure has changed in each of the three countries according to respective economic and historical situation, and the speed of changes also differs. The changes in the farming structure of Korea, China and Japan will influence the trade structure as well as the size of trade in the future. Accordingly, we will compare the farming structures of Korea, China and Japan, and will forecast how the changes in the farming structure will influence farm product trade.

Farming structure refers to the composition of farming products and the composition of the farmers, and the changes in the farming structure mean the changes in the characteristics and composition of the products produced and the characteristics of the farm households or farmers as business entities. In order for farmers to adjust to the changing economic environment, changes in the composition of commodities produced, division of labor and the flexibility of farmland should take place in a speedy manner. Korea and Japan's agricultural growth, unlike the developing countries, is limited due to demand factors rather than supply factors such as the utilization of inputs or technologies. This means that without growing demand for farm products with great income elasticity or the products with comparative edge that can be exported, it is difficult to expect farming growth (Lee 1998, p 13-18). It is normal that the income elasticity of vegetables and fruits grows higher than grains as the economy grows. Here, we will compare the changes in the composition of products which will directly influence the Northeast Asian farm trade and foresee the competitive relationship of the three Northeast Asian countries in the future.

For the farming situation, Korea, China and Japan lack arable land but have comparatively abundant capital and labor, and high technologies. Accordingly, they are heading toward land saving and capital intensive farming. Due to this, it can be assumed that the production resources are moving to vegetables and fruits from grains and from large livestock animals to small and mid-sized animals. If all the three Northeast Asian countries follow through this restructuring process, the farming structure of the Northeast Asian region is expected to become more competitive.

1. Korea

In terms of cultivation area and the number of livestock, the Korean farming structure is moving toward the land-saving, capital intensive pattern. Since 1995 when market opening accelerated, the farming structure has been fast changing with agricultural production decreasing on the whole.

The cultivation of Korean farm products shows a tendency to move from grains to fruits and vegetables. The cultivation area for food has decreased 16 percent from 2.41 million hectares to 2.02 million hectares between 1990 and 2002, which is higher than the decrease rate of the total cultivation area (11.7 percent). The cultivation area is decreasing but the utilization rate of cultivated land is decreasing at a faster pace. The grain cultivation area has

TABLE 4. Cultivation Land Changes in Korea

1,000 ha

	1990	1995	2000	2002	02/90 (percent)
Total	2,409(100.0)	2,197	2,098	2,020(100.0)	-16.1
grains	1,669(69.3)	1,347	1,317	1,299(64.3)	-22.2
- rice	1,244(51.6)	1,056	1,072	1,053(52.1)	-15.4
- barley	160(6.6)	90	68	81(4.0)	-49.4
- beans	188(7.8)	133	107	99(4.9)	-47.3
- others	77(3.2)	68	70	66(3.3)	-14.3
vegetables	311(12.9)	403	386	334(16.5)	7.4
- pepper	63(2.6)	87	74	72(3.6)	14.3
- garlic	44(1.8)	40	45	33(1.6)	-25.0
- onion	8(0.3)	16	17	15(0.7)	87.5
- greenhouse	35(1.5)	82	91	83(4.1)	137.1
- others	161(6.7)	178	159	131(6.5)	-18.6
fruits	132(5.5)	174	173	166(8.2)	25.8
- apple	49(2.0)	50	29	26(1.3)	-46.9
- pear	9(0.4)	16	26	25(1.2)	177.8
- grape	15(0.6)	26	29	26(1.3)	73.3
- peach	12(0.5)	10	14	16(0.8)	33.3
- mandarin	19(0.8)	24	27	26(1.3)	36.8
- others	28(1.2)	48	48	47(2.3)	67.9
Others	297(12.3)	273	222	221(10.9)	-25.6

Source: MAF, 「Handbook for Major Agricultural Statistics」, 2003.

gone down nearly 30 percent from 1.67 million hectares in 1990 to 1.3 million hectares in 2002, but the fruit and vegetable cultivation area increased 20 percent and 7 percent respectively. We can see that the importance of vegetables and fruits is growing among the plant farming focused on grains. Grains accounted for 69.3 percent of the total cultivation area in 1990 and went down to 64.3 percent in 2002. On the other hand, the proportions of vegetables and fruits during the same period increased to 16.5 percent and 8.2 percent from 12.9 percent and 5.5 percent respectively. This shows that the restructuring is being made to products which have high income elasticity.

The proportion of large livestock including beef cows and dairy cows among the total livestock was 2.6 percent in 1990 but went down to 1.8 percent in 2002. In particular, in the case of beef cows, the proportion went down steeply from 2 percent to 1.3 percent during the same period. Since the tariffs on dairy products were relatively high, the proportion of dairy cows went down only 0.1 percent point. On the other hand, the proportion of pigs among the total livestock greatly increased from 5.6 percent to 8 percent.

These results can be seen as the fact that for Korea, which has limited land resources compared with capital and technology, it was better to grow small and medium animals than large ones. The number of dairy cows increased but the number of beef cows went down sharply. Although there was the same shock of market opening, there was a difference in tariff rates and the trade potential. In the case of WTO concessionary tariffs (2004), it was 40 percent for beef and 176 percent for milk powder. Furthermore, fresh milk, which takes the largest proportion of dairy products, has low possibility of global trade.

TABLE 5. Changes in Composition of Livestock in Korea

Unit: 1,000 heads

	1990	1995	2000	2002	02/90 (percent)
beef cattle	1,622(2.0)	2,594	1,590	1,410(1.3)	-13.0
dairy cattle	504(0.6)	553	544	544(0.5)	7.9
pig	4,528(5.6)	6,461	8,214	8,974(8.0)	98.2
poultry	74,463(91.8)	85,800	102,547	101,693(90.2)	36.6

Source: MAF, 『Handbook for Major Agricultural Statistics』, 2003.

2. Japan

Japan has restructured the composition of its farm products, and the direction of restructuring is moving toward the land-saving form, although the move is very weak. The cultivation area in Japan decreased 19.6 percent between 1990 and 2002, but mostly it was due to the increase of set-aside land. The area cultivating fruits and grains has been reduced, but the rate of reduction is small. Japan's cultivation area for each product seems to have remained stable.

Between 1990 and 2002, the proportion of grains and fruits went down, but in the case of vegetables it went up. The composition ratio of grains went down a bit, since the rice composition ratio went up. The degree of protection of the Japanese rice market is stronger than other products, so there is high preference for rice cultivation in Japan.. Among grains, the products whose cultivation areas were reduced remarkably include barley and beans as in the case of Korea. Among vegetables, the products whose cultivation areas have expanded include fruits, vegetables, green vegetables and seasoning vegetables. The proportion of fruits among the total cultivation area went down slightly but the composition ratios of major fruits such as apples, pears and persimmons went up. Japan's restructuring direction seen through the changes in the composition ratio of products can be summarized as the decrease of grains excluding rice and the increase of major horticulture such as vegetables and fruits.

The number of livestock in Japan is declining, and the rate of decrease was 4.4 percent between 1990 and 2002. However, the number of beef cattle increased by 5 percent from 2.7 million to 2.84 million between 1990 and 2002. The number of other livestock such as dairy cows, pigs, and chickens greatly decreased. Pigs went down from 11.82 million to 8.79 million heads, 26 percent decrease, and the number of dairy cows went down 16 percent from 2.06 million to 1.73 million heads. The number of chickens went down 3 percent. Compared to Korea and China where the numbers of small and medium-sized livestock, such as pigs and chickens, are increasing, the number of large livestock is increasing in Japan. Accordingly, Japan is expected to have a complementary relationship rather than a competitive one with other Northeast Asian countries such as Korea and China in terms of livestock trade.

TABLE 6. Planted Land Changes in Japan

Unit: 1,000 ha

	1990	1995	2000	2002	02/90 (percent)
Total	3,784(100.0)	3,506	3,166	3,043(100.0)	-19.6
grains	2,791(73.8)	2,603	2,340	2,234(73.4)	-20.0
- rice	2,074(54.8)	2,118	1,770	1,688(55.5)	-18.6
- barley	369(9.8)	257	297	272(8.9)	-26.3
- beans	257(6.8)	156	192	192(6.3)	-25.3
- others	91(2.4)	72	81	82(2.7)	-9.9
vegetables	647(17.1)	588	540	540(17.7)	-16.5
- root vegetables	84(2.2)	78	68	63(2.1)	-25.0
- leaf vegetables	119(3.1)	114	107	103(3.4)	-13.4
- flavor vegetables	53(1.4)	52	52	49(1.6)	-7.5
- fruit vegetables	102(1.9)	90	80	76(2.5)	-25.5
- others	289(2.7)	254	233	249(8.2)	-13.8
fruits	346(9.1)	315	286	269(8.8)	-22.3
- apple	50(1.3)	48	44	43(1.4)	-14.0
- pear	18(0.5)	18	17	16(0.5)	-11.1
- grape	24(0.6)	23	20	20(0.7)	-16.7
- persimmon	26(0.7)	26	25	25(0.8)	-3.8
- tangerine	74(2.0)	65	58	56(1.8)	-24.3
- others	154(4.1)	135	122	109(3.6)	-29.2

Source: MAFF Japan, 『Statistical Yearbook of Agriculture, Forestry and Fisheries』, various years.

TABLE 7. Changes in Composition of Livestock in Japan

Unit: 1,000 heads

	1990	1995	2000	2002	02/90 (percent)
beef cattle	2,702(1.3)	2,965	2,823	2,838(1.5)	5.0
dairy cattle	2,058(1.0)	1,951	1,764	1,726(0.9)	-16.1
pig	11,817(5.8)	10,250	9,806	8,790(4.5)	-25.6
poultry	187,412(91.9)	193,854	187,382	181,746(93.1)	-3.0

Source: MAFF Japan, 『Statistical Yearbook of Agriculture, Forestry and Fisheries』, various years.

3. China

China's restructuring is under way in a similar way as Korea's. Between 1990 and 2002, the food cultivation area was reduced by 8.4 percent. But, the area for vegetables and fruits, on the other hand expanded by 174 percent and 76 percent respectively. The cultivation area reduction was significant for staple crops such as wheat and rice. However, the cultivation areas for corn and soybean are getting larger. The oilseed cultivation area expanded by 36 percent

The composition ratio of staple crops between 1990 and 2002 went down 10 percent, and the composition ratios of fruits and vegetables increased 2.4 percent points and 6.8 percent points respectively. The restructuring of China's crop cultivation is similar to Korea. Since the decrease in the composition ratio of grains is great, the composition ratios of fruits and vegetables are increasing.. But the composition ratio increase of vegetables is larger than that of fruits. This holds the meaning that there is a possibility that China's competition with Korea may deepen in the vegetable and fruit markets in the future.

TABLE 8. Planted Land Changes in China

Unit: 1,000 ha

	1990	1995	2000	2002	02/90 (percent)
Total	148,363(100.0)	149,879	156,300	154,636(100.0)	4.2
grains	113,466(76.5)	110,060	108,463	103,891(67.2)	-8.4
- rice	33,064(22.3)	30,744	29,962	28,202(18.2)	-14.7
- wheat	30,753(20.7)	28,860	26,653	23,908(15.5)	-22.3
- corn	21,401(14.4)	22,776	23,056	24,634(15.9)	15.1
- beans	9,163*(6.2)	11,232	12,660	12,543(8.1)	36.9
- potatoes	9,121(6.1)	9,519	10,538	9,881(6.4)	8.3
- others	9,964(6.7)	6,929	5,594	4,723(3.1)	-52.6
cotton	5,588(3.8)	5,422	4,041	4,184(2.7)	-25.1
oilseeds	10,900(7.3)	13,101	15,400	14,766(9.5)	35.5
hemp	495(0.3)	376	262	338(0.2)	-31.7
sugar	1,679(1.1)	1,820	1,514	1,818(1.2)	8.3
tobacco leaf	1,593(1.1)	1,470	1,437	1,328(0.9)	-16.6
vegetables	6,338(4.3)	9,515	15,237	17,353(11.2)	173.8
fruits	5,179(3.5)	8,098	8,932	9,098(5.9)	75.7
others	3,125(2.1)	17	1,014	1,860(1.2)	-40.5

Source: China Bureau of Statistics, 「China Statistical Yearbook」, 2004.

TABLE 9. Changes in Composition of Livestock in China

Unit: 10,000 heads

	1990	1995	2000	2002	02/90 (percent)
cattle	13,206(26.7)	12,866	12,824	13,085(22.0)	-0.9
pig	36,241(73.3)	44,169	44,681	46,292(78.0)	27.7

Source : China Bureau of Statistics, 『China Statistical Yearbook』, 2004.

In the case of livestock, China's proportion of small and medium-sized animals, rather than large ones, is increasing. The proportion of Cattle in the total number of livestock went down by 4.7 percent between 1999 and 2002, and the proportion of pigs went up. The number of pigs went up 27.7 percent during this period. This restructuring process of China in livestock is similar to Korea, so there is a high possibility that the competition relationship between Korea and China may deepen.

4. Structural Changes and Deepening Competition Relationship

The restructuring directions of the three countries in crops and horticultural products are greatly similar. The characteristic is simply summarized as the decrease in the composition ratio of grains and the increase in the composition ratio of fruits and vegetables. In particular, the composition ratio of vegetables is remarkably increasing. This restructuring Trend means the deepening competition in the intra-regional markets of vegetables and fruits and the growing dependence of grains to areas outside this region.

In the case of livestock, the restructuring direction of Japan is different from those of Korea and China. Korea and China have seen the decrease in the composition ratio of large livestock and the increase of small and mid-sized livestock. However, Japan is seeing the decrease in the composition ratio of small and mid-sized livestock and the increase in the composition ratio in large livestock. In the case of livestock, the intra-regional trade in Northeast Asia is expected to deepen the competition in Korea and China in the livestock market, and its dependence on outside the Northeast Asian region is expected to increase in case of large animals. The export potential of Korea and

Japan's beef and dairy products is expected to be comparatively lower than that of small and medium livestock.

Ultimately seen from the farming sector restructuring direction, the three countries in Northeast Asia are moving toward the land-saving, capital and technology intensive farming. In this process, there is a high possibility that it will develop into a competitive relationship rather than a mutually complementary or cooperative relationship. In particular, China and Korea are expected to face deeper competition in the Japanese market which is the biggest farm product import market in the world. China also has high possibility of deepening competitive relationship centering on vegetables and fruits in the Korean market.

The main imported farm products by Korea and Japan are grains and livestock products. On the other hand, the import amount of vegetables is relatively small. The proportion of grain and livestock imports is 55 percent among the total farm product imports (except for forest products) for Korea. In particular, the grains import is more than 30 percent of the total import. The fruit and vegetable import is comparatively smaller in size. On the other hand, the proportion of Japan's livestock imports is more than 30 percent of the total and above grains. Japan like Korea has a low proportion of imports of fruits and vegetables in total imports. Accordingly, if China, the biggest farm product exporter in the region, increases the export of grains and livestock products, it can maintain the complementary relationship with Korea and Japan. But if China increases its export of vegetables and fruits, the intra-regional trade relationship will become more competitive.

IV. Directions of Cooperation in Northeast Asia

1. Importance of Each Country's Role

If the three Northeast Asian countries can increase intra-regional agicultural trade in a mutually complementary way, the possibility of a regional trade agreement or a regional community to strengthen intra-regional economic cooperation will go up. However, if the Northeast Asian countries deepen a mutually

competitive relationship in the agricultural market, it will be difficult to form a regional community. In order to maintain a mutually complementary relationship and strengthen economic cooperation, the role of each country is important.

As previously analyzed, the agricultural sector in the three Northeast Asian countries is restructuring in a way that promotes land saving and capital or technology intensive farming with abundant labor. The composition ratio of horticulture rather than grains is going up, and the composition ratio of small and medium-sized livestock products rather than large animals is increasing. This restructuring in the Northeast Asian region has a high possibility of intensifying the mutually competitive relationship. However, we can also expect the relaxation of competition relationship according to the degree of role adjustment in each country.

China is the biggest farm product exporting country in this region and exerts the greatest influence in the intra-regional trade and competition structure. China is the exporter of main grains such as corn and rice, and Korea and Japan are the neighboring countries which import the largest amount of grains in the world. Accordingly, the role of China in grain trade is very important. If China increases its capacity to provide grains and increases the intra-regional grain self-sufficiency rate, then it can carry out a positive role for food security and relax the competition in the farm product market. However, China's agricultural restructuring is heading toward the path of less grain cultivation. It is expected that China's role as the provider of grains will decrease. On the other hand, as the cultivation areas for vegetables and fruits and their composition ratios are expected to increase, the competition relationship for horticulture in the region is expected to deepen. Northeast Asian countries' cooperation is needed in order for China to increase its role as a grain supplier. To this end, Korea and Japan, as food importers, need to consider providing quota amounts, investment, technical assistance, etc. to China and cooperate with China for its policy adjustment. Cooperation fund for the agricultural sector like EU's budget for Common Agricultural Policy should seriously be examined as a stepping stone of the region's economic integration.

The large-scaled farm product import market in Japan plays a buffer role for China's increasing farm product exports. Facilitating the farm product exports from Korea and China to the Japanese market will also help the intra-regional food security and agricultural cooperation. Northeast Asian coun-

tries need to harmonize inspections, customs, standards and markings for the facilitation of farm product trade. Japan needs to make improvements in such aspects as import charges, customs procedures, technology and standards related regulations including SPS, commercial practices and distribution systems. It is reported that there are around 50 mandatory technical regulations related laws such as food sanitation laws, plant quarantine laws and electrical equipment transaction laws. There are many cases when the certification system based on quality acts like a mandatory standard in reality. There are JIS (Japanese Industrial Standards), JAS (Japanese Agricultural Standards), S mark and G mark as the representative certification system managed by the private sector. As a result of Japan's non-tariff barriers posed on farm exporters (Choi et. al 2001), exporters feel that there are diverse non-tariff barriers including animal and plant inspections, protection policies, customs, and technical barriers.

Korea takes an important position in the global market in terms of grain import. Korea should take an interest in importing farm products that are highly import dependent on China. Of course in trade, commercial considerations are the highest priority. So in price and quality and other aspects, the improvement in the competitiveness of Chinese farm products should be made beforehand. Corn was a representative product imported from the United States, but now it is mostly imported from China and this can happen to other products as well. Korea should play the most central role in cooperating Northeast Asian countries to resolve North Korea's food shortage. Korea needs to work hard to export mass customized farm products to the niche market between the small-scale importer Japan and the large-scale exporter China to improve competitiveness and avoid the growing competition.

TABLE 10. Korean Exporting Companies' Complaints about Japan's Non-Tariff Barriers (15 companies)

	rules of origin	SPS	technical barrier	administrative barrier	custom	quota	protective policy
very high	1	4	1	-	-	2	2
high	4	7	5	1	8	2	9
medium	5	1	3	5	4	3	2
low	2	1	4	5	2	4	2
very low	1	-	-	-	-	1	-
total	13	13	14	11	14	12	15

Source: Choi et. al. 2001.

2. FTA, Tool For Strengthening Cooperation

The economic cooperation in Northeast Asia can be strengthened the most by forming a regional community like the EU. It can start from forming a lax regional economic bloc and then gradually increasing the degree of integration. It needs to start from the lax regional trade agreements like the FTA and then develop into stages like a tariff alliance, common market, economic community, economic union or alliance. It is important that this starts ultimately from the basic framework of competition.

Competition should be a negotiation rather than a game, and it should ultimately reap the same results as cooperation. It is important here to have the common thinking that we need to improve the Northeast Asia's inter-regional dependency. To this end, cooperation is the first priority for trade facilitation. That is to say that we need to harmonize the standards about the technical aspects called the diverse non-tariff barriers and share information. By harmonizing animal and plant inspections, customs procedures, markings and standards, and facilitating information exchanges between countries in Northeast Asia, the proportion of intra-regional trade will greatly rise.

For official and substantial discussions, inter-governmental cooperation rather than private-level cooperation is important. Regional trade agreements like FTA can be proposed as a realistic alternative. The regional trade agreement will contribute to the cooperation in farming through the discussions and conclusion of agreements in direct investment and technology transfer between countries.

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