July in the same year. Also, direct payments have been promoted in environmentally controlled areas since 1999, so have they in paddy agriculture since 2001 nationwide.

Organic agriculture in South Korea is not particularly export-orientated like China, Australia, New Zealand and the U.S.A., but it is thought that South Korea is increasingly under pressure to promote the exportation of her products to the Japanese organic food market in order to protect her organic agriculture from the inflow of Chinese green food products within the country.

(3) As far as organic agriculture is concerned, Japanese organic farmers have no power of competitiveness due to high land prices, high labour costs and high costs of other production materials. Farmers are therefore urging for governmental support such as a direct payment program which is already implemented in South Korea.

However, it is necessary to ensure that consumers will, or will not, support farmers with such a proposal. A questionnaire survey was conducted, and the Contingent Valuation Method was employed[1]. The following are the findings from this survey.

"It is 230 billion yen according to a majority decision rule, i.e. supported by 50% of the whole consumers, and it is 47 billion yen by applying a stricter rule, i.e. supported by 80% of the whole consumers. The results suggest that the consumers will agree governmental support such as a direct payment program for the farmers."

note 1) Kyoichiro ADACHI, Kaplan-Meier Survival Estimate of the Consumer's Evaluation Function for Organic Agriculture, *Quarterly Journal of Agricultural Economy* 54(2), April 2000.

Research on Refining the Methods of Forecasting Global Demand and Supply for Food, given Environmental and Resource Constraints

1. Objective

With domestic agriculture production as the base, appropriately matching imports and stockpile to provide a stable supply of food to the Japanese people is an important issue for Japan. Given this, our research aims to develop a more refined model for global demand and supply of food, which takes into consideration environmental and resource constraints.

2. Consisting studies

(1) Development of the economic model for global demand and supply of food that takes into consideration environmental and resource constraints.

A more refined model for global demand and supply of food, which takes into consideration environmental and resource constraints, and a forecast of trends in the global demand and supply of food by using this model.

(2) Research for potential food production capacities in principal regions of the world that takes into consideration of the constraints for environment and resources.

Environmental and resource constraint factors that impact on agriculture and food production are regionally diverse. Our objective is to understand the impacts of these environmental and resource constraint factors on agriculture and food production for each of the principal regions of the world, and then contribute to refining the demand and supply forecast, which is derived from the new global model to be developed under the study 2-(1), which is described earlier.

3. Outline of the results

(1) Survey of preceding studies

Survey on the preceding studies regarding integrated approaches for the international agricultural commodity markets and resource and environmental issues. It was found that there were not many related studies in this field. Moreover, the most distinctive study by IFPRI, IMPACT-WATER, still treats the water market prospects as an exogenous factor to their quantitative study on commodity markets. Therefore it is concluded that there were a number of issues to tackle for the theoretical and empirical integration of the food supply-demand analysis and resource-environmental issues.

(2) Development of a new system for commodity market forecasting

The existing world grain model has been improved. The major improvements are 1) transplantation to from MS-EXCEL VBA to VB system, 2) the development of interface and 3) an increase in the calculation speed.

In order to properly integrate the resource and environmental conditions to market analysis, a food supply and demand study by region was undertaken for China's maize and rice and Myanmar's rice. It is thought that the different supply responses in each region, reflect mostly the regions' production conditions such as climate, water availability and soil. The results of estimated supply price elasticities are shown in Table 1 to Table 3.

Research members

Tetsuya Nakata, Sotaro Inoue, Shunji Oniki, Masami Mizuno, Kazuyoshi Shiraishi, Koichi Nobe, Toshitaka Katsuki, Takashi Okae, Masashi Tachikawa, Kyoichiro Adachi, Junichi Shimizu, Fumiaki Suda and Akira Ishida

Table 1. Price Elasticities by Economic Region (China, Maize)

region	price elasticity	region	price elasticity
Northeast	0.465	Central-South	0.303
Central-North	0.722	Southwest	0.240
Central-East	0.293	Northwest	0.320

Table 2. Price Elasticities by Economic Area (China, Rice)

region	price elasticity	region	price elasticity
Northeast	1.215	Central-South	0.220
Central-North	1.679	Southwest	0.115
Central-East	0.354	Northwest	0.446

Table 3. Price Elasticities by Economic Area (Myanmar, Rice)

region	price elasticity	region	price elasticity
delta	0.20	coastal	0.01
lower Myanmar	0.07	highland	0.01
central	0.09		

Research on Evaluation Methods for Policies on Recycling and reuse of Organic Materials Originating from Agriculture

The MAFF is now establishing various policies on recycling of organic materials. In regard to the food industry, a law has already been enacted, which stipulates that each industry must reduce organic wastes by 20% within 5 years. In addition, other laws were enacted to ensure that livestock farms install equipment to prevent pollutants from animal manure. However, there are still no clear and definitive methods to evaluate such policies. Although there are many aspects to be dealt with, we have classified the issue points of many past discussions into three groups. The first is to establish a systematic view toward the objectives of the policies; the second is how to evaluate policies; and the third is examining what results have actually been produced.

In the first year, we tried to clarify the concept of recycling of organic materials, especially in rural areas (Fig.1). The second task was to develop an evaluation method. This was done through benefit transfer and conjoint analysis by means of a questionnaire survey. The result shows the evaluation can be transferred from one survey site to another in some situations. It helps to evaluate environmental policies in different locations.

Research members

Ryohei Kada, Motoyuki Goda, Kentaro Yoshida and Mitsuyasu Yabe