

**Report regarding the progress status of studies and problems encountered in 2005, and proposals regarding the implementation of further studies.**

## (1) Studies on evaluation and food policies

### 1) Studies on the evaluation of agricultural, forestry and fishery policies

In 2005, as part of study related to policy evaluation, the economic impact of farm income stabilization programs on government expenditure and farm economy was analyzed, and a model to be used for quantitative analysis of direct payments was developed. In connection with direct payments, the main points at issue in the next U.S. Farm Bill were investigated. On the other hand, in order to evaluate the stability of the Japanese food supply system, development of a food supply network model started, by making clear preliminary food supply flow in Japan.

### 2) Studies on evaluation of the environment for food, agriculture and rural area policies

In 2005, in the project-type study on multifunctionality of agriculture, the development of “Agri-Environmental Activities Check Software” started, which enables evaluation of farmers’ activity for conservation of the environment and exertion of multifunctionality, by calculating the environmental burden of their present agricultural production activity.

And as part of study related to the evaluation of various types of measure to exert multifunctionality, agri-environmental policies in EU countries were investigated, and a study on utilization of local commons was carried out based on examples in some Asian countries.

### 3) Studies on the causes of changes in international and domestic food supply and demand, and on forecasting food supply and demand

In 2005, Japan-Korea comparative analysis on the production and distribution structure of vegetables continued, and in relation to trends in vegetable production in Korea, actual conditions of the expansion of vegetables under facilities and trends in the seed and seedling industry were analyzed. Moreover, as the starting year of the project-type study

on the changes in the food system and trade structure produced by food safety needs (study on food safety and consumer confidence), the impact on the international market of the beef import ban, imposed due to an outbreak of BSE in Canada and the U.S., was analyzed using a food supply-demand model.

### 4) Studies on food consumption trends and on food consumption policies

In recent studies on food consumption, the focus of analysis is shifting to food quality in addition to quantity and prices, and safety is the most important factor of food quality.

In 2005, as the starting year of the above-mentioned project-type study on food safety and consumer confidence, U.S. studies conducted on COI (Cost of Illness) were surveyed as part of study of the cost-benefit evaluation system of measures to secure food safety. Problems which would occur in its application to Japan were also examined. A joint study with external psychology specialists on the psychological evaluation of food safety by consumers and food industry and a study on the risk management process in the food industry was begun.

### 5) Studies on the efficiency and stability of food supply systems from production to consumption, and on related policies

In 2005, analysis of the food distribution system continued, and factors affecting the changes in trade margin rates of agricultural and fishery products and food industry products were analyzed. Analysis of the price transmission structure in the food system also continued. Studies on the food system were pursued in closer connection with the above-mentioned project-type study on food safety and consumer confidence.

## (2) Studies on rural development policies

### 1) Studies on policies for the development of management structure and operation of agriculture, forestry and fisheries

A study on farm business management for core farmers, a study on local reaction to “reform of rice policy” designed to shape the future of paddy farming, a study on the reorganization of vegetable production areas coping with an aging farmer population, and with increases

in vegetable imports, and prospects analysis of aged farmers' retirement and of farm size changes have been examined. Additionally, research has been carried out on a project for the modality of agricultural policies that develop and support the leading pioneers of food safety and environmentally friendly agriculture.

## **2) Studies on policies for stabilizing farming, forestry and fishing communities and for improvement in welfare of farmers, forest workers and fishermen**

A study on the welfare functions of rural communities, such as public nursing care insurance for the elderly; and on cultural functions in rural areas, such as theatrical activities, performed on an ongoing basis has been examined. A cultural function analysis of rural literature and rural artists, and investigation into activities of agricultural training were carried out.

## **3) Studies on policies for economic revitalization in farming, forestry and fishing districts, hilly and mountainous areas**

A research project titled "Studies on policy of building-up various lifestyles and revitalizing rural areas" has been carried out, which investigated actual conditions of urban-rural exchange as follows: a study on characteristics of people who have newly entered rural areas from urban areas and support systems, and measures on a local level to promote newcomers' settlement in Shimane prefecture; a study on farming volunteers' activities in the suburbs of Tokyo; a study on various types of green tourism in some regions, and a nationwide investigation of accession conditions of school-children in mountainous areas; and study on activities of direct agricultural marketing.

As a part of studies focusing on economic revitalization in hilly and mountainous areas, a statistical analysis of vanished agricultural communities have continuously been carried out.

## **4) Studies on policies for the conservation and better use of resources in farming, forestry and fishing districts, hilly and mountainous areas**

A case study on the behavior of non-agricultural enterprises which have newly entered farming has continuously been conducted to confirm the effects of promoting utilization of abandoned farmland, including them in Special Zones for Structural Reform. A study on the adoption mechanism of eco-friendly farming and an estimation analysis on reduction of environmental impact using organic resources such as livestock manure has been carried out.

# **(3) Studies on international policies**

## **1) Studies on trends in international relations concerning food, agriculture and rural areas, and on international adjustment policies**

As a part of studies on measures taken in the transformation of rural communities in developed nations, the new policies to accept urban people were investigated in France. In addition, as part of analyses of international trends with respect to the rapidly increased adoption of genetically modified crops, the situation regarding different national policy approaches causing international friction, the relationship between labeling regulation and WTO agreement, and the legal status of precautionary principles were clarified. New policy movement concerning bio-fuel crops in the US and Brazil were investigated. As part of studies on free trade agreements (FTAs) and economic partnership agreements (EPAs), the negotiating process was examined through the international trade model. In addition, the recent information about WTO panels on US cotton policy and EU sugar policy and review of agricultural modernization law in France was broadly gathered and analyzed.

## **2) Studies on trends in food, agriculture and rural areas and policy direction in Europe**

As part of a research project titled "Study on rural revitalization policy taking account of changes in lifestyle", trends in population movement in Europe and the US were clarified. In addition, the relationship between finance and rural development policy was investigated in these areas and compared with the Japanese situation. As part of the study on the geographical indication of agricultural products, zoning standards for AOC cheese were analyzed in France.

## **3) Studies on trends in food, agriculture and rural areas and policy direction in the Americas and Oceania**

As part of the research project titled "Studies on international trends of conflicts and harmonization of agro-biotechnology policies under the WTO system", information about policy development in the US, Brazil, and Australia was gathered. Characteristics of these countries with respect to agro-biotechnology situation were clarified, such as the US regulation system, Brazil's new bio-security act and Australia's domestic frictions over introducing genetically modified canola.

#### **4) Studies on trends in food, agriculture and rural areas, and policy direction in Asia and Africa**

Research projects to clarify the food and agriculture situation in Asia and Africa were continued as follows: an analysis of the structure of comparative advantage of agriculture and non-agriculture in China; a study on rural development policy and farm management in China; an investigation of structural changes of food trade and those factors in South East Asian countries; and a study on changes in food supply and demand in East Asia. Also, research on African countries revealed the mechanism of impact on agricultural land utilization caused by wars in neighboring countries and the economic benefits of developing a rice milling industry.

## ● Research into Measures for the Revitalization of Rural Communities in Response to Lifestyle Changes

The object of our study is to help revitalize agricultural, mountain and fishing villages through exchanges between cities and villages, so that the diverse hopes and expectations of consumers/nationals may be met. Our study is designed to make clear how to properly bring about conditions for successful future encouragement of the formation of diversified lifestyles or of new settlement in agricultural, mountain and fishing villages, and what influence/effects are to be exerted on or are produced in these communities.

### (1) Making clear how to properly bring about conditions for formation of diversified lifestyles and revitalization of agricultural, mountain and fishing villages

(a) We analyzed trends in population movements between cities and agricultural villages. While concentration of population in large urban areas has become the mainstream, there are cities, towns and villages where population inflow has actually been in excess of population outflow. These municipalities have had a common feature: they endeavored to make exchanges between cities and rural areas and to get people from cities to settle in their communities.

(b) We analyzed the true state of new entries into agriculture/farming villages by those from cities who seek new lifestyles and concluded that tasks to be tackled in order to facilitate their entry into agriculture should be to give them advice at the window more efficiently and to improve the loan/training systems. Concerning their joining these communities, it is important for such municipalities to implement a comprehensive settlement policy and utilize networks of people making the “I” turn.

(c) We considered community reactivation movements that have originated from within agricultural, mountain and fishing villages as these communities have undergone changes in their traditional lifestyles. Revealed were flexible measures to reorganize communities to prevent their social functions from degrading due to shrinking, and the effects of women entrepreneurs or women’s participation in social activities, and effects and problems of accepting children from outside the community (to get them to temporarily stay there for study etc.: Sansonryugaku).

(d) We considered how to improve the environ-

ment for two-way exchanges between cities and agricultural, mountain and fishing villages so that they may constitute part of yet another new lifestyle. What was revealed was the route some urban participants in these exchanges have followed: the exchanges take such forms as sale of agricultural products and operation of a system for participation in agriculture (volunteer work on a farm) based on cooperation between producers and consumers, and some of those from cities have taken up agriculture as their occupation and settled down in the communities concerned.

### (2) Studies on international comparison of conditions to develop various lifestyles in order to revitalize agricultural, mountain and fishing villages

(a) We studied the tendency to add new values to agricultural villages by changing lifestyles in society. In particular, we discussed the theory of “rurality” advocated in U.K. rural geography and found out that the phenomenon, which has been common to advanced countries, has been supported by the trend toward post-production-oriented thinking and by the positive representation of agricultural villages by the media.

(b) Concerning new entries into agriculture and related policies, we analyzed trends seen in France. Many of these entries from non-agricultural sectors tend to be seen in sectors other than crop cultivation, and new entrants from outside regions have tended to diversify their management.

(c) We examined the residents’ participation-type method of promoting regional development for agricultural villages. The LEADER program of the EU is characterized by the emphasis on non-agricultural activities, utilization of specialists from outside the community and reorganization of local autonomous entities. In Canada also, they have pursued a bottom-up type regional development policy.

(d) We contemplated population flow from cities back to agricultural villages in advanced countries. In America, population movement to non-urban areas cannot be explained by the agricultural factor alone, and measures to help attract population to the provinces have been taken not directly for the persons/households concerned but for the municipalities.

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## ● Multifaceted functions “Policy evaluation analysis for realizing the multifaceted functions of agriculture”

Amidst the call for rationalization of trade deregulation and agricultural protection, realizing the multifaceted functions of agriculture in various undertakings, such as assuring the safety and security of food, conserving national land, and preserving the environment, has become more crucial than ever. The project under consideration was launched in fiscal 2004 as a research project for examining how policy for supporting the multifaceted functions of agriculture should be implemented.

In this research project, the following items are examined to identify the foundation on which the policy of this multifaceted functionality stands, and an efficient way to implement it.

- 1 Development of an environmental accounting framework and environmental assessment in agriculture, forestry and fishing
- 2 Analysis of institutions and policies related to multifaceted functions
  - (1) Details of policies and measures related to multifaceted functions in developed countries, especially in Europe, and suggestions for Japan
  - (2) Clarification of schemes for conservation and preservation of multifaceted functions in developing countries, especially those in Asia, and suggestion for Japan
  - (3) Examination of the possibility of policies and measures for maintaining multifaceted functions in Japan

As a result of consultation and deliberation with concerned parties, it was concluded that to have a wide range of management entities in agriculture, forestry and fisheries industry adopt environmental accounting, for the time being, it is more important to understand the effects of environmental preservation than to ascertain its cost. Based on this conclusion, a decision was made to develop a tool with which management entities in agriculture, forestry and fisheries industry would be able to check environmental preservation activities for themselves. This is how “Software for Checking Agricultural Environment Activities” was developed. This PC software, targeting rice growers, calculates the burden on the environment caused by their current production activities and evaluates and inspects the effectiveness of efforts being made to realize environmen-

tal preservation and multifaceted functions. Though it will need to be improved in various ways in the days to come, the software is expected to help make farmers more aware of the environment and objectively indicate how well they are dealing with the issue of environmental preservation.

Analysis of institutions and policies related to the multifaceted functions of agriculture aims to study actual conditions in various countries regarding policies and measures related to multifaceted functions, and to derive suggestions on policies and measures pertinent to Japan.

Developed countries, centering on Germany, considered implementing the 2003 Common Agricultural Policy reform. The characteristic feature of Germany’s approach lies in its gradual implementation of the Single Farm Payment Scheme and strict adherence to cross compliance. With regard to the former, since 2005 Germany has established its unit cost under a scheme that “combines” a system based on past performance and a system that cuts across commodity items. In the future, the payment amount will gradually become fixed in accordance with future performance, and it is expected that from 2010 to 2013 adjustments will be made toward a unified price based on a system that cuts across commodity goods. The latter (i.e., strict adherence to cross compliance) is being implemented through the establishment of a “Direct Payment Obligation Provisions Law” regarding “appropriate farming and ecological condition”. If cross compliance is strictly enforced, there will be a call for an even stricter requirement and implementation of agro-environmental policy eclipsing the standards, thus raising fears that the number of farmers participating in the agro-environmental policy will decrease.

In France, a new Agricultural Orientation Law was adopted in 2006 to keep in step with the implementation of the Single Farm Payment Scheme. The new law, unlike the French Orientation Law of 1999 that attached importance to multifaceted functionality of agriculture, places emphasis on strengthening the competitiveness of management entities in agriculture.

In developing countries, centering on China and India, a survey on maintenance and management of shared resources in farming



villages was conducted. In China, a quantitative analysis of data collected in the Xishan district of Kunming City, Yunnan Province was conducted by using optimization theory and evolutionary game theory. As a result, it was found that, because there are few employment opportunities outside of agriculture, there is little income disparity between users, and constraints caused by limited resources are severe, concerted action for conservation of resources is promoted in communities where there are various social conversion games. Stated differently, communities where these conditions are not met tend to have a relatively high incidence of Prisoners' Dilemma and are more likely to see their efforts in preserving and managing shared resources end in tragedy. The survey also implies that equal distribution of income among users of resources (income transfer) is indispensable for realizing the multifaceted functions of agriculture.

In addition, a conceptual model was built concerning the relationship between management of resources shared by members of a farming community and its multifaceted functions. With the existence (or non-existence) and management form of irrigation and drainage canal in Japan's rural communities and those in rural China as targets, the model quantified the relationship between these targets and the prevailing socio-economic conditions, and on the basis of this quantification, examined how management of shared resources should contribute to the maintenance and realization of multifaceted functions. In China, the level of cooperation in managing shared resources was found to be high in regions where agriculture accounts for a high percentage of the economy or where there are many mountainous areas and the like that block or hinder market access, and low in regions where the ratio of agriculture to GDP is low or where jobs are available in surrounding areas. It was also discovered that the greater the total number of days community members take part in concerted action, the higher the level of cooperation in managing shared resources, thus indicating that strengthening the regulations helps raise the level of shared resources management. The same trend is seen in Japan's rural communities. Moreover, a quantitative analysis of the relationship between management of shared resources and socio-economic conditions based on agricultural census and individual data collected in rural community surveys shows that management of shared resources solely by rural communities brings about reduced multifunctionality, and greater heterogeneity of community members associated with growth in nonagricultural labor market lowers the level of shared resource management.

As for India, the subject taken up was the management of small reservoirs in the state

of Tamil Nadu. Small reservoirs constitute a typical example of shared resources found in rural communities. Rice growers, as beneficiaries of these irrigation facilities, have jointly managed them through the ages. The following factors were discovered to cause lack of activity in management of small reservoirs (i.e., insufficient investment in shared resources). (1) A high rate of privately owned wells in areas that benefit from pond irrigation. (2) A high percentage of high school graduates in the villages. And (3) a high degree of inequality in the ownership of cultivated land in areas that benefit from pond irrigation. However, (4) the number of owners of cultivated land in areas that benefit from pond irrigation does not have a significant impact on the level of small reservoir management. These findings indicate that the lack of involvement in the management of small reservoirs is due to a surge in privately owned wells and a rise in educational standard in rural communities, both brought about by India's recent economic growth. This suggests that the problem will not be solved so easily. Moreover, when small reservoirs are not properly managed, the gap in living standard widens between those families who can afford to use well water and those who cannot. This shows that management of such shared resources as small reservoirs helps reduce poverty and narrow the gap in income levels.

In Japan, the following are suggested by the results of several surveys – three community surveys plus a fact-finding survey of an urban-rural exchange program conducted in Ukiha City, Fukuoka Prefecture and a questionnaire survey conducted in Ukiha Michi-no-Eki:

- (1) It is rice fields that mainly provide multifaceted functions, so preserving paddies equals preserving multifaceted functions.
- (2) Since demand for functions is difficult to pinpoint and functions are never provided separately, multifaceted functions are always difficult to evaluate in economic terms and seldom lead to specific policies.
- (3) "Environmental functions" generated by conservation of farmland should be differentiated from "socio-cultural functions" resulting from positive action taken by farmers and the like.
- (4) With regard to environmental functions, promoting community conservation and developing a scheme for direct payment of environmental expenditure would be appropriate. A valid step for achieving the latter would be to adopt marketing policies and measures that promote sale of agricultural products and encourage urban dwellers to visit the community.

- (5) It is effective to divide and target activities of members of farm households in terms of those carried out in the farm field, those carried out in its periphery, and those carried out in the surrounding area, and it is necessary to implement measures that regard these activities as a unit in accordance with the situation in the local community.
- (6) Agriculture promotion can contribute to the maintenance of multifaceted functions, but it does not always lead directly to such maintenance.
- (7) Some communities should consider steps, including obligatory ones, to preserve their farmland.
- (8) Providing employment opportunities is a must.
- (9) There is an urgent need to consider implementing measures for promoting various ways to make use of farmland, including using it as a place to take working holidays or to engage in farming as a hobby after one retires.
- (10) There is a need to consider adopting a comprehensive measure that brings together activities done in the field, in its periphery, and in the surrounding area.

## ● Agrobiology “Clarification of movements in international friction over agrobiological restrictions under the WTO regime and direction of efforts at harmonization”

The project under consideration was launched in fiscal year 2004 as a three-year research project based on results of the “Study of overseas movements in policy planning concerning the production and distribution of genetically modified agricultural products”, conducted between fiscal years 2000 and 2003.

Agrobiotechnology, especially the rapid progress that has been made in recombinant DNA technology in recent years, has made it possible to greatly improve crops, microorganisms, and the like. But on the other hand, the general public, including consumers, are reluctant to embrace this technology. Or differences have emerged in the way countries regulate its application. For example, this difference in approach has triggered a serious trade friction between Europe and the U.S. Amid all this controversy, positive measures are being taken at OECD, CODEX and other international organizations to harmonize the international bio-regulatory oversight. Also, as a rule for settling trade disputes in the field of agrobiological application of various WTO agreements is emerging as an important challenge for the global community.

Under these circumstances, regarding overseas trends in agrobiological application, it is necessary to analyze the existing situation, background and impact from two perspectives: the situation involving policies adopted by different countries and production and distribution in these countries; and issues like trade disputes that cut across national boundaries. The present project will, by conducting research on these points, aim to contribute to the promotion of Japan’s appropriate response to the global debate and negotiations in the field of agrobiological application and to consistency of agrobiological policy across national boundaries.

The results gained in the research study of

policies adopted by different countries and production and distribution in these countries are presented below.

In the United States, a need has risen to review the current regulatory measures, which were established in 1986, to keep step with the subsequent progress and expanded range of applications. The USDA (United States Department of Agriculture) has proposed a complete overhaul of the regulatory regime, and is now preparing to assess the impact agrobiological application has on the environment. The Food and Drug Administration (FDA) has proposed guidelines on unintended interfusion at the experimental stage in the development of new proteins. On the other hand, groups and other entities opposed to growing genetically modified wheat for commercial purposes has raised issues concerning the relationship between federal government and state government on the question of who has regulatory authority over GM wheat. This dispute has attracted the attention of various organizations and research institutions. In addition, the U.S. is proactively implementing assistance measures to developing countries with an eye to promoting GMO, extending technical development assistance, and designing biosafety policies and the like.

The Australian Government, in accordance with the provisions of the Genetic Technology Law, which came into force in June 2001, approved the growing of carnations, cotton and canola for commercial purposes. However, because of the serious concern farmers voiced about canola, which until then had never been grown for commercial purposes, the various state governments imposed a freeze on the growing of GM canola for commercial purposes in their respective states. As a result of this distortion between federal and state governments, only GM cotton is grown for commercial

purposes in Australia.

In March 2005, the Biosecurity Act was issued, which placed authority over permission of research, growing, and marketing of genetically modified organisms with the Brazilian National Biosafety Committee. The enforcement regulations were set down in November. Today, only commercial growing of soybeans and cotton produced by Monsanto is permitted. However, thanks to the passage of the Biosecurity Act, production of GMO is expected to expand from here on. Other issues facing Brazil include the dispute over payment of royalties that has broken out between producers and Monsanto, the ban on exporting of GMO crops from main grain port of Paranagua by the Parana state governor, unauthorized farming of corn that have been detected in some areas, etc.

China has announced the following developments; large-scale commercial production of GMO in the area of cotton and vaccine for veterinary medicines, and commercial production of bell peppers, petunias, and tomatoes. Research and development of more than 100 kinds of GMO under the guidance of the government.

From 200 to 300 safety applications have been filed, and the development of GM rice, corn, wheat, and soybeans is at the stage of environmental discharge. With regard to rice, application for four varieties of rice stemming from two lineages with indica rice grown early in the south as genetic host have been submitted, and a careful examination of the effect on the environment, market, and so on is being conducted.

Taking a bird's eye view of Europe and the U.S indicates that a difference has emerged between the way EU and the EU member countries apply recombinant DNA technology for commercial purposes and the way U.S. applies the same technology. In the former, departments and agencies in charge of environmental policies regard the practical application of the recombinant DNA technology as a form of environmental discharge and therefore choose to regulate it, while the U.S., led primarily by departments and agencies in charge of agricultural policies, promotes the industrial use of the same technology as an integral part of its agricultural policy. The different positions on GMO taken by different countries can also be explained from this kind of comparison.

The study on issues affecting countries throughout the world obtained the following results:

First, following through on the analysis of

the significance of the general concept of the precautionary principle adopted in the previous fiscal year, the EU analyzed its involvement with GMO regulations and the precautionary principle and rigorously adopted the latter at the time it implemented a moratorium on GMO approvals. By contrast, from around 2000, when it released a document concerning the precautionary principle, the EU changed its position and adopted a policy that stressed the importance of science-based risk analysis. The EU revealed that this shift in policy reflected its 2004 decision to lift the moratorium and that behind this decision were the EU interpretation of the SPS Agreement and the precautionary principle that the WTO adopted in the beef-hormone case.

In addition, following through on the analysis of the previous year, the EU conducted an economics-based analysis on the precautionary principle and revealed that, as an option value of precautionary principle, there is a school of thought that stresses economic value of GMO, that is, even when an irreversible risk to the environment or human beings is expected, and there is not enough information based on scientific data on such a risk, rather than doing nothing and just waiting for such information to accumulate, steps should be taken to prevent the risk, even if their effectiveness is in doubt.

With respect to cases of disputes brought to the WTO over food safety and animal and plant quarantine measures, analysis was carried out on what issues were raised in each case and what sort of decision was handed down.

Furthermore, starting with research on the plant variety protection regime, which is important for the development of new plant varieties including GMO, other research studies were conducted on various trends in developing countries, specifically those in China, a country considered particularly important for addressing the challenges posed by developments in GMO. In China, where the plant variety protection regime is being installed with cooperation from Japan, the number of applications and registration has increased sharply in recent years. In China, suits against infringement of plant variety right may be filed with the government authority or the People's Court. Although there were around 200 such suits last year, since most involved domestic cases, when it comes to plant variety right, the situation in China is still far from being improved enough to gain the trust of the international community.



## ● Study on the Modality of Agriculture Policies that Develop and Support the Leading Pioneers of Food Safety and Environmentally-friendly Agriculture

To cope with the increasing market share of imported food, we should seek to qualitatively differentiate domestically produced foods from imported foods by (a) pursuing strategic development of sustainable agriculture to produce foods that meet consumer needs, including safety, high quality and reduced burden on the environment, and (b) establishing/expanding, without delay, traceability systems and Good Agricultural Practices (GAPs) with high cost performance that can help secure the confidence of consumers. The object of our study, therefore, is to find out what the conditions are to help develop farm management entities oriented toward such agricultural management, and what the policies for supporting such agriculture should be.

### (1) Concerning sustainable agriculture

#### (a) Development process of policies for sustainable agriculture

We first checked the development process of policies for sustainable agriculture at the Ministry of Agriculture, Forestry and Fisheries.

We also studied how effective these policies have been since the enforcement of the Law for Promoting the Introduction of Sustainable Agricultural Production Practices. Criteria for evaluating these policies were whether the quantity of organic substances applied/used has been maintained and whether the quantity of chemical fertilizers (nitrogen fertilizer) applied/used has been reduced. We found that that evaluation results have been unstable and that on the whole, they have been low. Next, we investigated the actual management conditions of projects to encourage sustainable agriculture by focusing on working expenses, while making a preliminary check as to how the execution of these projects and the trend in the number of certified organic farmers or the number of eco farmers have been related (execution has made a great contribution to the establishment of eco farmers).

#### (b) Leaders

Since 1995, an annual contest has been held to promote sustainable agriculture and honor outstanding cases recommended by Prefectural Councils to Promote Sustainable Agriculture. In the 10 contests held between 1995 and 2005, a total of 470 cases won official commendations. Concerning these cases, we checked, according to the pertinent recommendations, the trend of activity themes each of the farmers concerned has pursued over the years, as well as other factors.

#### (c) Management of sustainable rice cultivation

Concerning farming households engaged in

sustainable rice cultivation, we find out management peculiarities of these households, through the rearrangement of the data provided by the “report of survey on management analysis of farm households promoting eco-friendly farming(rice-crop)” (Statistics Dept., Ministry of Agriculture, Forestry and Fisheries; Sept. 2004) to execute management analysis by cultivation form and by size of acreage under cultivation/management.

The more environmental preservation-oriented the cultivation form is, the larger its gross revenue, operating expenses and earnings per 10a. However, because a similar tendency is seen of working hours per 10a, earnings per working hour in all the cultivation forms are almost on the same level. Also, in the case of organic cultivation households, the larger the planted area, the greater the income from both organic rice cultivation and conventional rice cultivation compared with those at households using reduced amounts of agricultural chemicals/chemical fertilizers.

The larger the size of acreage under cultivation/management of a farming household becomes, the smaller the ratio of land devoted to sustainable rice cultivation. It could be said, however, that the scale of this type of rice cultivation is quite large, as seen from the fact that in the group holding 10 hectares or more of land under cultivation, they adopt this type of rice cultivation for about 60% of all their land devoted to rice. Also, for farming households tackling sustainable rice cultivation, a relatively large percentage of their produce is not delivered to agricultural cooperatives, suggesting that they have their own markets.

#### (d) Policies for environment-friendly agriculture in Korea etc.

We confirmed (visually, by looking at graphs) that in Korea, the Sustainable Agriculture Promotion Act (1997), the direct payment system for environment-friendly agriculture (1999) and other laws and institutions and support policies that have been introduced have probably contributed greatly to the spread of such agriculture. Concerning the EU, about which there are fewer data restrictions, we built up and proved the hypothesis concerning “effects of introduction of laws, systems and support policies on the diffusion rate of specific agricultural methods”, and confirmed statistically that various measures to support organic farming have made contributions to expansion of planted areas.

#### (e) Demand for organic farm products

Using a more unified survey (General Social Survey) for an international comparison, we analyzed purchasing behaviors of consumers for or-

ganic farm products and confirmed that (i) women rather than men; the middle-aged and the elderly rather than young people; and consumers participating in consumer movement groups rather than those not participating, buy organically grown produce more often (ii) the higher a household's income is, the more often it buys such produce; and (iii) in Tosan and Kyushu, where they actively engage in sustainable rice/vegetable agriculture, consumers purchase such products relatively often.

## (2) Information gaps in traceability systems

Concerning traceability, we used results of the fiscal 2004 questionnaire sent to and collected from producers, distributors and consumers to find out, by a non-parametric inspection, what information gap for each of the tracing items exists between these food chain links or within each of the links.

Our findings revealed that between producers and wholesalers, there are few gaps between in-

formation needed and information disclosed, indicating that information conveyance between them is favorable. On the other hand, it was shown that there exists a big information gap between retailers and consumers, supporting our former hypothesis that along the food chain, information gaps are wider downstream.

As for the information gap within each of the food chain links which reflects the difference between information received and that sent within it, our findings showed that at the stage of distribution, the information gap is larger within retailers than within wholesalers. This suggested that, even if a certain amount of information is received by the link concerned, there is the possibility that only a smaller amount of it can be sent (disclosed) to the link downstream.

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# ● Understanding Changes in Food System and Food Trade Structure Brought About by the Need to Ensure Food Safety

The object of our studies is: to establish a Japanese-type cost-benefit evaluation system for measures to ensure food safety through analysis of systems actually adopted in Western countries; to quantitatively analyze effects of import prohibitions etc. to secure food safety in global food trade and the domestic food system; and to analyze awareness of food safety, and risk recognition and management by various constituent groups of the food system.

## (1) Study of a cost-benefit evaluation system for measures to ensure the safety of food

We surveyed a cost-benefit evaluation system for such measures, i.e. COI (Cost of Illness), which is used in the U.S. to evaluate food safety policies. Although COI values are sturdy and reliable, it would be necessary to adjust the number of victims concerned based on a scenario analysis in applying COI to evaluation of measures adopted in Japan, where estimated numbers of victims of various food poisoning cases based on epidemiological analyses are not available.

## (2) Quantitative analysis of effects of import prohibition etc. to secure food safety in global food trade structure and domestic food system

Using the AGLINK model, we forecast trends in international beef prices between 2004 and 2006 on the assumption that a beef embargo would be imposed during that period. We found

that, in comparison with the scenario in which no such embargo is in place, prices will rise significantly, and that, upon resumption of beef exports to countries other than NAFTA members, they will fall slightly. We also used the GTAP model to measure effects on various countries of the removal of the beef embargo.

## (3) Analysis of realities of ensuring safety of foods within the food system

We made, on an experimental basis, an analysis model for psychological evaluation by the constituent groups of the food system of food safety. Using a questionnaire, we confirmed that there are statistically significant differences in awareness among producers, distributors/processors and consumers. Concerning the seafood system, we obtained information as to how fishermen's cooperatives fix an order of priority concerning safety of marine products they handle and what effort they have been making to establish an appropriate traceability system for them. Further, concerning the risk management processes adopted by the above constituent groups of the general food system, we statistically verified results of a USDA analysis of how the ages of beef cattle are judged.

**Researchers:** Tomoo Higuchi, Junko Kinoshita, Atsuyuki Uebayashi, Kentaro Kawasaki, Tetsuro Yakushiji, Katsuya Takahashi, Tomoko Ichida, Yuichiro Takahashi, Kazuyo Hirakata

**Outside researcher:** Tomio Kinoshita, Makoto Fukui

## List of the Research Subjects

Name of Subject	Name of Researcher
<b>1. Studies on evaluation and food policies</b>	
<b>(1) Studies on the evaluation of agricultural, forestry and fishery policies</b>	
Study on economic impacts of farm income stabilization programs in US, Canada, EU and Japan	Kunihisa Yoshii, Tomoko Ichida
A study on evaluation of stability in the food supply system	Kunihisa Yoshii
Development and application of the model for quantitative analysis of direct payments	Kentaro Kawasaki
<b>(2) Studies on the evaluation of the environment for food, agriculture and rural area policies</b>	
Studies on environmental accounting for agriculture	Motoyuki Goda, Takashi Hayashi, Atsushi Tanaka, Yoshifumi Takahashi
Analyses of policy measures with respect to multifunctional roles of agriculture	Motoyuki Goda, Hiroki Sasaki, Junichi Ito, Tomoko Ichida, Takeshi Fujie, Fumiaki Suda, Takeshi Sakurai
<b>(3) Studies on the causes of changes in international and domestic food supply and demand and on forecasting of food supply and demand</b>	
A comparative study of vegetable production and distribution between Japan and Korea	Toshitaka Katsuki, Shigenori Kobayashi, Gyunghee You
An econometric analysis for the impact of trade ban/restriction measures due to food safety, on the structure of the international trade and on the domestic food system	Atsuyuki Uebayashi, Kentaro Kawasaki
<b>(4) Studies on food consumption trends and on food consumption policies</b>	
A study of cost benefit evaluation system for policy securing food safety	Tomoo Higuchi, Junko Kinoshita
Analysis of the actual condition of food safety and consumer confidence in the food system	Tetsuro Yakushiji, Katsuya Takahashi, Tomoo Higuchi, Tomoko Ichida, Yuichiro Takahashi, Kazuyo Hirakata
<b>(5) Studies on the efficiency and the stability of food supply systems from production to consumption and on related policies</b>	

Name of Subject	Name of Researcher
Economic analysis of Japanese food distribution system	Tetsuro Yakushiji
An empirical analysis of price transmission system in the Japanese food industry	Yasutomo Kojima
<b>2. Studies on rural development policies</b>	
<b>(1) Studies on policies for the development of management structure and operation of agriculture, forestry and fisheries</b>	
Study on the modality of agricultural policies that develop and support the leading pioneers of food safety and environmentally-friendly agriculture	Kyoichiro Adachi, Yoshihiko Aikawa, Yoshihisa Aita, Katsuya Takahashi, Kiyofumi Ishihara, Kenichi Atsuta, Koichi Sato
A study on regional reactions to new rice policy	Takaaki Watanabe
Studies on retirement of farm workers born in the 1926-1935 period	Tsutomu Matsuhisa
A study of farm business management on core farmers in Japan	Gentaro Suzumura
A structural analysis of vegetable farming areas	Yasutoshi Ideta, Toshitaka Katsuki, Tsutomu Matsuhisa, Shigenori Kobayashi, Gyunghee You
A study on domestic vegetable production systems responding to demand for food processing and food services	Toshitaka Katsuki, Shigenori Kobayashi, Gyunghee You
<b>(2) Studies on policies for stabilizing farming, forestry and fishing communities and for improvement in welfare of farmers, forest workers and fishers</b>	
A study of welfare, cultural and social functions in agriculture and rural society	Yoshihiko Aikawa
<b>(3) Studies on policies for economic revitalization in farming, forestry and fishing districts, hilly and mountainous areas</b>	
Studies on policy of building-up various lifestyles and revitalizing rural areas	Tomoaki Ono, Osamu Chiba, Toshitaka Katsuki, Tsutomu Matsuhisa, Noboru Hashizume, Akira Egawa, Gentaro Suzumura, Takeshi Fujie, Koichi Sato, Shigenori Kobayashi

Name of Subject	Name of Researcher
Studies on the change in the rural community and management of rural resource	Noboru Hashizume, Gentaro Suzumura, Takaaki Watanabe, Izumi Uzawa, Motoyuki Goda, Kiyofumi Ishihara
<b>(4) Studies on policies for conserving and the better use of resources in farming, forestry and fishing districts, hilly and mountainous areas</b>	
Case studies for nonagricultural business organizations' entry into farming	Tomoaki Ono
The adoption mechanism of eco-friendly farming: the role of social interactions	Takeshi Fujie
An economic analysis for recycling of livestock soil	Yoshifumi Takahashi
<b>3. Studies on international policies</b>	
<b>(1) Studies on the trend of international relations regarding food, agriculture and rural areas and on international adjustment policies</b>	
Comparative study on rural restructuring under the condition of local economic integration in advanced countries	Masashi Tachikawa, Fumiaki Suda, Tomoko Ichida
Analyses of international relations with respect to agribiotechnology policies	Masato Ito, Nobunori Kuga, Norio Fujioka, Yasuo Watanabe, Shoichiro Kawahara, Koichiro Akashi, Fumiaki Suda
Studies on the international agriculture and agricultural policy situation for the strategy of multilateral and bilateral agricultural negotiations	Masato Ito, Yasuo Watanabe, Nobunori Kuga, Shoichiro Kawahara, Koichiro Akashi, Ryuichi Fukuda, Atsuyuki Uebayashi, Kentaro Kawasaki, Junichi Shimizu, Tatsuji Koizumi, Takeshi Sakurai, Takashi Okae, Tomoo Higuchi, Gyunghee You
Theoretical Consideration for Free Trade Agreement Negotiation by International Trade Model	Ryuichi Fukuda
Survey for international bio-ethanol policies and impacts of bio-ethanol program on the world agricultural markets	Tatsuji Koizumi



Name of Subject	Name of Researcher
<b>(2) Studies on the trend of food, agriculture and rural areas and policy direction in Europe</b>	
International comparative study on conditions for building-up various lifestyles and for revitalizing rural areas	Masashi Tachikawa, Tomoko Ichida, Fumiaki Suda
Socioeconomic analysis of quality identifying arrangements for agricultural products: case study of France	Fumiaki Suda
<b>(3) Studies on the trend of food, agriculture and rural areas and policy direction in the America and Oceania regions</b>	
Analyses of social and economic factors with respect to agribiotechnology policies	Yasuo Watanabe, Fumiaki Suda, Junichi Shimizu, Masashi Tachikawa, Tatsuji Koizumi
<b>(4) Studies on the trend of food, agriculture and rural areas and policy direction in Asia and Africa regions</b>	
A study of the comparative advantage of Chinese economy	Junichi Ito
A study on the movement of agricultural and rural policies and farm management in China	Shoichiro Kawahara
Changes and driving forces in the food trade of Southeast Asian countries	Sotaro Inoue
Research on change of food demand and supply in East Asia Area and food trade trend that concern with the situations	Yoshihisa Aita
Fragility of the Sahelian farmers and soil degradation: A consideration of policy intervention	Takeshi Sakurai
Studies on policies for poverty alleviation by the enhancement of agricultural productivity in low-income, food-shortage countries	Takeshi Sakurai
The Impact of Participatory Forest Management in India: From the Viewpoint of Poverty Alleviation and Multifunctionality	Takeshi Sakurai
Studies on the influence of agricultural cooperatives and microcredit on peasants' economy in Vietnam	Takashi Okae