

Report regarding the progress status of studies and problems encountered in 2002, 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

Ahead of the other ministries, MAFF began the implementation of policy evaluation in 2000, and it is expected to continue implementation according to “The Basic Plans for Policy Evaluations by the Ministry of Agriculture, Forestry and Fisheries” and “The Execution Plans for Policy Evaluations by the Ministry of Agriculture, Forestry and Fisheries”, which are to be formulated based on the Government Policy Evaluation Act, which became effective in April 2001. Furthermore, with the intention of realizing these plans, the involvement of and collaboration between the Policy Research Institute (hereinafter referred to as the “Institute”) and MAFF in the development and improvement of evaluation methods has been clearly stipulated; thus, expectations for the Institute’s competence are growing.

Under such circumstances, comprehensive evaluation agendas for “The Execution Plans for Policy Evaluations by the Ministry of Agriculture, Forestry and Fisheries” currently involve research pertaining to the “rice policy”, as well as other studies in connection with management and safeguard policies. In 2002, A Study on Systematizing Food, Agriculture and Rural Area Policies was started and a paper with respect to a “Policy Hierarchy” was published.

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

On the matter of environmental evaluations, the Institute has been a pioneer in adopting methods to evaluate external economic effects, using methods such as the contingent valuation method (CVM) and the hedonic method. These studies have been endeavoring to simplify and improve the accuracy of these methods by positively applying them to activities such as the evaluation of rural settings. Furthermore, these studies have

been diligently engaged in the enhancement of public understanding of the importance of the multifunctionality of agriculture by utilizing research results as basic data to help illustrate the concept to local authorities in Japan and ASEAN nations, as well as to use in OECD discussions about agricultural multifunctionality. A study project begun in 2001, “Development of a Policy Evaluation Method Regarding the Promotion of the Cyclic Use of Organic Resources of Agricultural Origin”, was continued.

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

As part of the special research conducted on behalf of the government, many achievements were made in the field of the supply and demand analysis of rice, vegetables and fruits, and the results were reported to the Administrative Department. Especially with regards to research on the effect of price stabilization policy for vegetables, the effective findings were yielded using “cost benefit analysis”.

Also, a study project concerning “the Refinement of a Method to Predict World Food Supply and Demand” was continued, and the development of a model has been undertaken.

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

With studies on food consumption focusing on the quantities and prices of food products, as well as on the analysis of their quality, and with “safety” being of utmost importance, information regarding food labeling issues in Germany was forwarded to the Administrative Departments, based on the assumption that food safety analysis will be a key issue in food and agricultural policies. For this purpose, in 2002, a new research project, “Studies on the Development of Crisis-Management Systems for Food and Agriculture”, was started.

Also, research on the econometric analysis of dairy products consumption yielded many positive results.

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

Intensified by cases of BSE, growing concern among consumers about food safety has increased consumer awareness of product history labeling (i.e. food traceability), and has increased the demand for more research with a holistic approach -one that considers all stages of the “food system”, from production to consumption.

However, the results regarding the food system for vegetables were already completed in 2002. Also as part of the special research on behalf of the government, an analysis of food distribution costs was done using Input-Output Techniques.

(2) Studies on rural development policies

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

The New Fundamental Law was established with the aim of enabling us to sustainably develop agriculture while emphasizing nurturing of various types of leaders. As one of the strategies, the status of the initial stage of new start-ups, and support systems of new farmers were typified.

Simulations of farm-land use were run assuming three scenarios including the cases of the existence/lack of farm-successors. The results of the simulation showed a definitive correlation between supply and demand for farmland lease and the need for adjusting transaction consistency between simulated results and actual factors influencing farm-land lease was verified with statistical analysis.

Analysis of the agricultural census data has clarified the current conditions and movements of agricultural industry supporters (farmers, agricultural business organizations other than farmers, agricultural service organizations and agricultural hamlets) in a comprehensive manner, and these results have been published as a book.

Further, the shape of the future of rice agriculture was forecasted by districts in the mid-and-long term, by combining agricultural census data and other statistical data.

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

One cause of the decline in birthrate is the increase in unmarried people of young and

middle age. Further, a cause of the increase in unmarried people is a scarcity of unmarried women in rural areas. Another total of the results of the National Census in 2000 made it appear that rural districts clearly had more unmarried men than unmarried women, in comparison with urban areas.

With regard to issues on the welfare of the elderly, the current status of rural nursing-care services and job creation have been investigated by a comparative study between rural and urban circumstances. On a national basis, since the start of the nursing care insurance system, many business corporations have started supplying nursing-care services, but 2/3 of these did not break into rural areas. The supply of nursing-care services is in the process of changing.

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

In order to revitalize the rural economy in farming, forestry and fishing districts, the study explores a concrete way for coexistence of urban and rural communities. Firstly, the index of rural revitalization has been revised by incorporating forestry-related indicators. With the use of the revised index, a study set up some revitalization categories on a regional basis to create a diagnostic sheet.

Secondly, abandoned farmland is increasing in hilly and mountainous areas. Accordingly, a predictive model for the decrease in farmland was developed, and the precision of the model was improved by utilizing agricultural census and other data in this model.

Thirdly, a case study of green tourism was conducted, as it is one way of urban and rural interaction, and its social/economic effects on rural communities were explored.

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

The increase of abandoned farmlands and disappearance of villages have sounded the alarm for urgent action for the conservation of agricultural and forestry resources. As a countermeasure, a prediction model was developed to forecast the decrease of farmlands, and an actual condition survey was conducted to examine the model's effectiveness. The study has been finished by improving this prediction model by incorporating agricultural census data.

Toward realization of a low-loaded rural society, evaluations of environmental loads and measurements of the potential availability

of organic resources have been carried out in three Japanese regions. How to plan the use of organic resources in these three regions was also studied. Furthermore, the study estimates the extent of the reduction of environmental loads and the economical efficiency of these plans towards a systemized method, with the intention of proposing effective measures to vitalize both agricultural and industrial activities.

(3) Studies on international policies

1) Studies on the trend of international relations as to food, agriculture and rural areas and on international adjustment policies

In response to global food problems, research has been engaged in the development of a world food supply and demand model, and has been investigating the potential of food productivity in major regions around the world, taking environmental and resource-related factors and constraints into consideration. Also, information concerning food production in major production regions, i.e. the Asia-Pacific region and South America, has been accumulated. The study will be continued to analyze the present situation and the future trend of environmental resources there. The study will further its analysis using information about water and land.

The studies on the measures taken in the transformation of rural communities in developed nations have demonstrated an increasing emphasis on environmental conservation and the independent status of rural communities. Especially they showed the necessity of the following items for vitalizing rural areas: partnerships between individuals and various organizations, 'niche' markets, entrepreneurship and so on.

As to genetically modified organisms (GMOs), more information about policies and regulations of European countries, Australia, and China was gathered with field investigation. The analysis says after accession to the WTO, policy measures can be characterized as a guard for domestic agriculture.

Also, the relation between GMO labeling and the WTO agreement was clarified, and theoretical aspects of the relationship between changes in trade and the environment were discussed. The study was furthered by inclusion of field investigations and other relevant activities into its analysis.

In addition, the impact on agriculture of free trade agreements by two countries will be analyzed and allocation of the benefits pro-

duced through preserving genetic resources will be investigated.

2) Studies on the trends of food, agriculture and rural areas and policy direction in Europe

Through comparative studies on the revitalization of rural life in Europe, studies elucidated the current status of the operation of agro-environmental measures in France and agro-environmental policies in Germany and the Netherlands. Under the studies, a field investigation was made regarding the rural landscape and rural buildings in France. In 1994, the government published a report titled "Policies for preserving cultural patrimoine". In Germany, after Agenda 2000, policy change will be analyzed with special consideration of natural preservation programs and the difference among regions.

In relation to the food safety issue in France, research analyzed measures related to the BSE case, and developed an understanding of a systematic approach to risk management. Also, it clarified functions of independent surveyor's organizations and local responses to market globalization will be focused on.

As for the former Soviet republics, a study has confirmed that there are great differences among countries under the WTO regime as to policies taken after their independence and as to the development that followed. But in the 90's, in all the countries, new production leaders are appearing, and all equally want modernization of production machinery and equipment.

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

Information about circulation and policy framework concerning GM foods has been collected. In Australia, technology development, the implementation of a labeling scheme and GM cotton, which is only one of the products produced commercially, were investigated. In Brazil, a situation of illegal increase of GM production and de-regulation corresponding to producers' interests were indicated. Also, the importance of Brazil's agriculture was emphasized and research will be enlarged into the analysis of soybean production.

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

For Asia and Africa, a wide range of stud-

ies were conducted involving research of the formulation process of South Korea's environmentally-friendly agricultural policy, and the study of the change in the international price of rice, which showed a gradual decline synchronized with prices of other cereals. Repeated and periodical rises and falls of the price in South Asia were shown too. Also two analyses concerning China were implemented. One clarified the relation of the development of rural industries to the economic imbalance between regions, and the second showed the relation

between the reform of land ownership and performance of enterprises. Studies related to economic understanding of excess grazing in Mongol and North China will be conducted.

As to research of agriculture in developing countries and our cooperative activities, it was pointed out that Japan's ODA has put too much importance in terms of funds on agriculture infra-structure and must be re-oriented so as to make possible transfer of software-oriented technology, and that various kinds of agents must participate in the project.

Outline of Research **Project-type Research**

● **Research on the Practical Uses of Regional Resources for Rural Revitalization**

The National Institute for Rural Engineering played the chief roll in this project's research, with 30 topics divided among 5 research institutes. PRIMAFF was responsible for the following 5 topics.

(1) Analysis of the Factors in Rural Revitalization and Rural Development Planning for Advanced Nations

In planning for rural revitalization, one of the most important issues is maintenance of IT (information technology) hardware/software, which is lagging behind urban areas, and its application to industry and lifestyle.

In Japanese rural areas, the rate of spread of IT remains low compared to America. IT plays a large role in supporting the lifestyles of elderly, single people and in the education of children. The IT centers that can be seen in rural areas in the UK contribute to regional revitalization in the following forms. First, they create business for IT specialists, secondly they create employment for home-makers who have had IT training, and thirdly they support activities in the local community.

(2) Comparative Analysis of Institutional Construction Regarding Rural Development Policy Planning

Rural development policies and the local self-government systems of Japan and Europe, France in particular, will be comparatively studied. In support of the multifunctional aspect of agriculture as environmental conservation, France began the CTE (contrats territoriaux

iaux d'exploitation) from 1999 while Japan began a policy of direct payment to farms in hilly and mountainous areas from 2000.

As points shared in common by both, one can mention first that they both gave broad regional discretion with regards to policy implementation, second farms are not screened, and third both required group efforts. In France, roughly 36,000 small-scale communes exist as local authorities, but these are trying to form cooperative groups in order to take advantage of rural development policies.

(3) Prediction of Trends in Utilizing Regional Resources Including Land Affected by Social and Economic Changes in Rural Areas

With regards to changes in farmland, the most basic regional rural resource, panel data from 47 prefectures, was used to make predictions. The prediction model structure shows how the rate of population change, level of progress in land improvement, price index of agricultural products, rate of change in income of the prefectures' citizens, and percentage of the agricultural workforce held by senior citizens, exert influence on the conversion of farmland to uses other than farming and the abandonment of farming.

Regarding growth rates in regional economies and changes in the price index of agricultural products, when 5 scenarios were assumed and simulated, a decrease of between 12.9% and 15.2% in farmland area was forecast for 2015 as compared with 1999. The rate of decrease in farmland varies greatly depending on the region, and therefore rural

promotional policies will need to be implemented as appropriate to each region.

(4) Formulation of the Index for Rural Revitalization and Development of a Method of Regional Diagnosis

In order to appropriately conduct regional development policy for a given rural area, it is necessary to have a comprehensive and quantitative understanding of the socioeconomic dynamics of that area. Principal component analysis was conducted for 2,469 municipalities, excluding urbanized regions, bringing together 44 statistical indicators in the 4 fields of population upkeep, regional economic development, agricultural development and forestry development.

The level of revitalization in each municipality is shown on a single diagnosis sheet. From this, the rank of that region as compared with national and prefectural average values and policy issues for revitalization become clear.

(5) Analysis of the Revitalization Mechanism by Long-term Nursing-care Facilities in Rural Areas

The goals of the Nursing-care Insurance System, implemented in 2000 are first to put market mechanisms to work in caring for the

elderly, secondly to allow elderly in need of care to receive this care at home, rather than entering nursing institutions, and thirdly to change from the previous situation, in which the family mainly provided care, to a situation in which others/society takes on a higher ratio of the responsibility.

When a survey of nursing services was conducted in the urban areas of Kanto and the rural areas of Kyushu, the following became clear. First, in urban areas the number of business and medical corporations newly entering nursing-care service is remarkable, and the supply of service for the elderly population is increasing greatly. Secondly, business conditions in rural areas are favorable. Thirdly, an increasing employment effect was found to be conspicuous for women aged 40 and over, and nursing-care service institutions have great significance as places of local employment, particularly for rural areas.

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● Study on Overseas Movements Regarding the Development and Regulations of Genetically Modified Crops

Introduction

This research was carried out as part of the study, "Comprehensive Study on Ensuring Safety in the Industrial Use of Genetically Modified Products" (1999-2003) conducted by the Ministry of Agriculture, Forestry and Fisheries.

Over recent years, the development of biotechnology has been remarkable, and the application of genetic manipulation technology in the agricultural industry is rapidly on the increase. On the other hand, the social acceptance of genetically modified (GM) products in many countries around the world is in question. There are debates over the safety aspect of GM products as well as labelling regulations and trading rules not only between governmental bodies but also producers, consumers and others who are concerned in these issues. Considering such circumstances, this research was intended to interpret and analyze the actual overseas movements regarding the devel-

opment of GM crops and relevant regulations by means of social and economic analysis, and to clarify the influence and circumstances behind these movements.

In 2002, a field survey regarding movements of production, distribution and consumption of GM crops and food products as well as related regulations, was implemented in the UK, Germany, China and Australia. Information on relevant movements in some other advanced countries was also acquired by means of literature and the use of the Internet.

Among other countries, China is a mysterious country with regard to production and related regulations of GM products, even though it is the fourth largest country of area of GM crops. One of the project members visited China in December 2002 to interview government regulators and researchers. According to his report, Bt cotton is the predominant GM crop that is mainly produced in the Hwang Ho Basin. The Chinese government has been

rapidly investing the development of GM crops. However, it has introduced strict labelling regulations partly because of its intension to protect domestic products from increasing imports after joining the WTO. This attitude has caused trade friction with the US recently.

Table 1. Scale of Research on Biotechnology in China

	Number of staff	Budget (million US\$)
1986	740	4.2
1990	1,067	8.3
1995	1,447	10.5
2000	2,128	38.9

In addition to these country reports, a social and economic analysis was carried out in order to clarify the different policy approaches between the US and EU over GM crops and food products.

One of the project members returned from the University College London, and has started to analyse people's valuation of GM food, especially in comparison between Japan and the UK.

Table 2. Policy Approach to Ag-biotechnology: US/EU

	US	EU
Commercial production	Active registration	Moratorium since 1998
Substantial equivalence	Satisfactory	Not satisfactory
Precautionary principle	Negative	Positive
Labelling	Voluntary	Obligatory
Political attitude	Supply-driven	Demand-driven

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● World Food Demand and Supply Project

“Research on the refining of forecasting methods of world food demand and supply under environmental and/or resource constraint factors (FY 2001- 2003)”

It is important for Japan to plan a stable supply of food by adequate combination of domestic production, which is the most important element, with imports and/or stocks. This research aims at the development of a world food demand-supply model that takes into account environmental and/or resource constraint factors, and thereby contributes to policy planning for securing a stable supply of food for the nation. This research consisted of the following two items;

Item 1; “The development of a world food demand-supply model that takes into account environmental and/or resource constraint factors”. For developing a more refined world food supply and demand forecast model, which reflects environmental and/or resource constraint factors, firstly, the theoretical study of the structure of the model, secondly, the development of the model through data processing and programming, and thirdly, making the forecast using this developed model are carried out.

Item 2; “Research on the potential production capacity of food by taking into account environmental and/or resource constraint factors in important food production regions of the world”. As there are various environmental

and/or resource constraint factors which affect agricultural and food production in a number of regions of the world, country studies are carried out for the analysis of potential production capacity of agricultural and food production, by taking into account such environmental and/or resource constraint factors for the principal agricultural and food production regions and countries of the world.

In the Fiscal Year 2002, for Item 1, economic theories which consist of a background of introducing environmental and resource constraint factors into the world food supply and demand model were studied, and a pilot-model was developed in which the supply side of the model was defined as profit-maximization of the producers who produced multiple products under such constraint factors. As a result, the quantitative analysis of the effect of farm-land and irrigation capacity on principal cereals such as wheat, maize, and rice has become possible. After these studies, the regional and country classifications were decided to be 11 modules in the model, taking into account the availability of statistics.

For Item 2, the country studies that mainly focused on the current situation of agricultural and food production, and, land resources and availability of water resources for agriculture were carried out for China, Mongolia, South-East Asia, South Asia, South America, and Australia. Especially, the analyses were conducted for the determinative factors for

food production, taking into account environmental and/or resource constraint factors.

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

In recycling residues of foods and introducing sustainable agricultural production methods, and disposing animal welfare without environmental load, MAFF has already put forward many programs in order to support recycling processing of organic materials. But, there are still no clear and definitive methods to evaluate such programs and 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 organic materials, especially in rural areas. 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.

In the second year, three jobs were handled. The first was a comparison study between evaluations before and after. A conjoint analysis can be better than a simple CVM. The second was an estimation of waste account specially referring to organic wastes on the national level (Fig.1 & Table 1). As a result, it can be said that some amount of environmental load is reduced when all paddy straws produced in Japan are used as compost-fertilizer without import. The third job is a clear recognition of agro-environmental policy by MAFF for these four decades. It must be said that today, at last MAFF is at a crucial stage for taking decisive policy measures for recycling organic materials.

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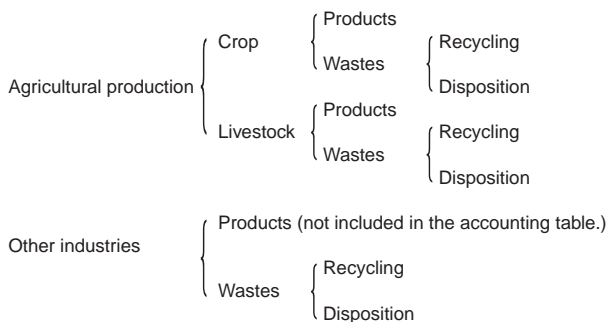


Fig. 1. Division of Industries and Economic Activities

Table 1. Change of Environmental Burden in Case of Not-using Imported Paddy Straws

	Paddy straw (1000t)		SPM(t)	CH ₄ (t)	N ₂ O(t)
	Recycling	Disposition	Discharge	Discharge	Discharge
In case of import of paddy straw	2,208.3	556.5	4,290.7	3,026.4	94.8
In case of non-import of paddy straw	2,618.1	146.7	1,131.4	649.7	70.2
Change of quantity	409.8	-409.8	-3,159.3	-2,376.7	-24.6

● Economic Analysis on Stabilization of Vegetable Supply and Demand

While demand for vegetables has been increasingly diversified and also the importation of vegetables has been increasing, the reduc-

tion of prices of vegetables has created considerable influence on Japan's domestic production. In such circumstances, this research

project has conducted research on the following four subjects in order to clarify the problems of stabilization of vegetable supply and demand and to indicate related policy implications.

(1) Demand analysis of vegetables by intended purposes

The objective of this research is to understand changes in demand for vegetables according to certain types of items and their intended purposes, plus whether they are domestically produced or imported. The intended purposes can be classified in three groups: for household consumption, for food manufacturing, and for business and services (catering and ready-to-eat meals industry). The proportional representation of the estimation of overall vegetable demands in 2000 by intended purposes in terms of gross food is 44% for household consumption, 15% for food manufacturing and 41% for business and services (see “PRIMAFF Annual Report 2001”, pp.22 ~ 23). Also, we estimate the proportion by items as shown by Table 1.

(2) Development of a method for the evaluation of the vegetable price stabilization program

The objective of this research is to evaluate and verify the vegetable price stabilization program by applying cost-benefit analysis.

Only DPAs (Designated Production Areas) are approved areas for the price supplement. The estimation is based on the assumption that the same measures apply to both DPAs and non-DPAs without the price stabilization program (i.e. the reduction of cropping acreage in both DPAs and non-DPAs in the following year due to the previous year’s price decline: see “PRIMAFF Annual Report 2001”, pp.19 ~ 20).

The estimated V/C value of the sum total of 13 major items from 1990 to 1999 is 7.0, which shows the program has performed efficiently.

(3) Establishment of a quantitative method for the evaluation of the impact on domestic industries created by the increase of vegetable imports

Recently Japanese vegetable production has been seriously affected by the increasing import of vegetables, particularly in the case of green onions. According to the estimated demand function of green onions in this study, the price elasticity of demand is -0.175 (see “PRIMAFF Annual Report 2001”, pp.20 ~ 21). This means that a 1% increase in supply invites a 5.7% decrease in price. The sharp drop in the price of green onions in 2000 due to import increase was caused by such demand characteristics. As a result, the grower’s income decreased to approximately half of that in the preceding years.

(4) Investigation and analysis regarding safeguard policies in other countries

This research organizes and analyzes actual safeguard measures applied by other WTO member countries and some findings made by panels and the Appellate Body in the WTO. Judging from the findings made by panels and the Appellate Body, and the actual situation of the relevant factors having a bearing on the situation of domestic industry evaluated by WTO members, before we apply safeguard measures, it is essential for us to establish strict interpretations of the like or directly competitive relationship of the products and to also establish methods of evaluating the relevant factors quantitatively and of assessing the effects of increased imports (see “PRIMAFF Annual Report 2002”, pp.24 ~ 25).

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Table 1. An Estimated Demand for Vegetables by Intended Purposes (2000)

(1000 t, %)

	gross food	for household	for manufacturing	for foodservice
Onions	1,442 100.0%	640 44.4%	298 20.7%	505 35.0%
Tomatoes	1,297 100.0%	527 40.6%	523 40.3%	248 19.1%
Carrots	781 100.0%	371 47.5%	171 21.9%	239 30.6%
Chinese cabbages	902 100.0%	428 47.5%	175 19.4%	298 33.0%

● Study on Overall Evaluation of Rice Policy in Japan

1. Research Objective

Comprehensive policy reforms with respect to the production and marketing of rice have been an important task for the Japanese government in recent years, due mainly to the overproduction of rice and continued price declines for farmers. For this reason, the overall evaluation of rice policy has been attempted in this research project for FY 2001-03. Three sub-themes have been selected to analyze and evaluate government rice policy in the 1990s, namely, (1) production control and set aside programs for rice; (2) changes in rice market and price analysis; and (3) analysis of rice production structure.

2. Major Findings

Major findings of this research project can be summarized as follows:

- (1) Production control measures have been effective in stabilizing rice prices for farmers and increasing production of soybeans and wheat which are diverted from rice production. However, these measures have not only increased the net social cost for consumers and/or taxpayers, but also hampered necessary structural reforms of rice production. Furthermore, according to the results of cost-benefit analysis, the B/C ratios have been declining sharply in the 1990s due to the increased finan-

cial burden to the government and decreased income of rice farmers coming from rice price decreases.

- (2) Price formation of voluntarily marketed rice (VMR) and its competition with the non-orderly marketed rice (non-OMR) have been analyzed. The newly introduced "price requesting system" has weakened the competitiveness of VMR with non-OMR, due to higher prices requested by VMR shippers irrespective of the real market situation. Furthermore, a rapid increase of non-OMR has negatively influenced the VMR sales by stronger market competition.
- (3) Rice production structure has changed enormously since the 1990s. The statistical analysis using the Census data has revealed an overall reduction of average farm size, drastic reduction of the number of farmers depending mainly on rice, the aging structure of the agricultural labor force, an increased number of farming entities other than farm households, and increased acreage of idle farmland. In addition, by means of the Markov matrix analysis, it is estimated that the rate of increase of the number of large-size farms will level off in the long run.

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● Research on the Establishment of a Risk Management System for Food and Agriculture

1. Research Objective

In order to satisfy consumers' expectations for food safety, it is indispensable for the government to establish a proper risk management system for food and agriculture. Recent food-related incidences including the outbreak of BSE in Japan have, however, increased uneasiness and fear about food safety among consumers. For this reason, the establishment of a risk management system for food and agriculture has become one of the most urgent and important policy reforms in Japan recently.

The main objective of this research project is to examine what alternative policy measures should be adopted to establish food-related risk management from the standpoint of social sciences. To this end, various economic

and econometric analytical tools will be applied in order to clarify the mechanism of the outbreak of food risk, to estimate the monetary values of economic influences derived from such disasters, and to conduct cost-benefit analyses of the adoption of risk management policy. Furthermore, various field surveys in Japan and research trips to the EU and USA will be carried out to make a comparison of food safety policies including the adoption of "from farm to table" traceability systems in those countries.

2. Research Outline and Major Findings

In order to fulfill the above research objective, the following four sub-themes and

research teams have been organized.

(1) Evaluation of Economic Impacts from Food Risks

By using mainly input-output analysis, various economic evaluation of the outbreak of food risks or hazards will be conducted on both regional and national levels, and by industrial sub-groups. This analysis will be applied to such cases of food poisoning as O-157, milk, and BSE (beef). For the year of 2002-03, using the case of rBST (recombinant bovine somatotropin), economic impacts of the adoption of biotechnology upon the industry structure have been estimated.

(2) Economic Analysis of Risks Related to Food and Agricultural Safety

Economic analysis on food risks is attempted from both demand and supply sides. On the demand side, consumers' risk aversive behaviors will be analyzed by means of econometric tools such as CVM and conjoint analysis.

On the supply side, monetary cost incurred to meet with food safety regulations by both private industry and governments will be estimated. Thereafter, cost-benefit analysis will be attempted based on these demand and supply analyses, and its policy implications will be discussed with respect to risk management systems.

(3) Development of Risk Communication Methods Related to Food Safety

In FY 2002-03, food risk-related incidences which took place in the post-war Japan are classified and analyzed from the standpoint of risk communications. Based on this analysis, the development of risk communication methods will be attempted by means of the concept of "study of failure".

(4) Comparison of Food Safety Policies and Institutions

The main purpose of this study is to examine the basic characteristics of institutional and policy arrangements related to food safety in Japan, which are compared to the other major Western countries. For FY 2002-03, risk management and quality assurance schemes with respect to the traceability of beef have been analyzed, based upon field surveys conducted in Iwate and Yamanashi Prefectures.

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● Price Prediction of Major Fruits Using Demand Functions

Though there has been an increase in fruit juice consumption, the decreasing tendency continues for consumption of fruits for fresh use in Japan. Especially, consumption of the *Unsyu* mandarin, which represented half the fruits used, has decreased largely. *Unsyu* mandarin consumption continued to decrease from a 19.0kg per capita in 1975 to 6.7kg in 2001. A decline like this of demand lead to a fall in prices.

Recently the role of fruits in human health has been noticed. However consumption shows a tendency to decrease, and the market price continues to decline, too. As a result, the farm economy is affected seriously.

Under this situation, with respect to major fruits, price stabilization programs are be-

ing enforced.

The objective of this study is the evaluation of the validity of these programs, especially the domestic production adjustment program.

For this purpose, the demand functions of major fruits using annual or monthly wholesale market data were estimated or used for the main fruits, and the price formation factors were analyzed. Furthermore, price prediction was done using estimated demand functions.

Major Findings are as follows.

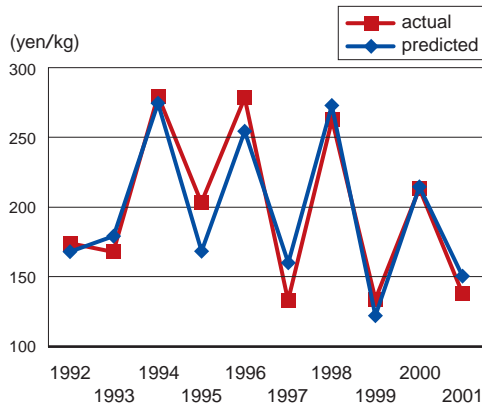


Fig. 1. Average Price of *Unsyu* Mandarins

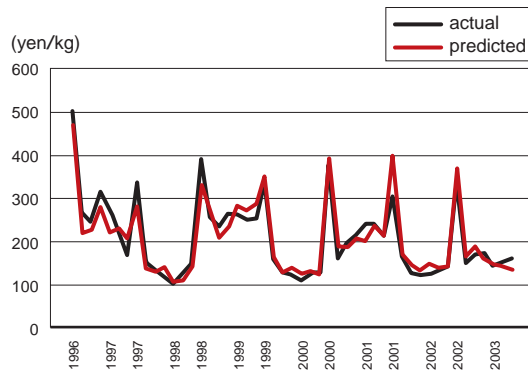


Fig. 2. Monthly Prices of *Unsyu* Mandarins
(except apr. - aug.)

$$\begin{aligned} \text{ALOG}(P1/\text{DEF} * 100.) = & -39.4113 + 2.63452 * \text{ALOG}(C) - .409246 * \text{ALOG}(Q1/\text{POP}) \\ & (-3.692) \quad (+2.988) \quad \quad \quad (-2.634) \\ & +.930900 * \text{ALOG}(P2/\text{DEF} * 100.) + .484881 * \text{ALOG}(P8/\text{DEF} * 100.) \\ & (+6.848) \quad \quad \quad (+2.187) \\ & +.917388 * \text{ALOG}(\text{TOUM}) + .503711 * \text{ALOG}(P21/\text{DEF} * 100.) + 1.17470 * Z9 \\ & (+3.222) \quad \quad \quad (+4.558) \quad \quad \quad (+5.227) \\ & +.681277 * Z10 + .880779 * Z11 + .478162 * Z12 + .675756 * Z1 + .858560 * Z2 \\ & (+2.010) \quad \quad \quad (+2.468) \quad \quad \quad (+1.130) \quad \quad \quad (+2.650) \quad \quad \quad (+3.651) \end{aligned}$$

ADJ/R * R/ = 0.885 S.E. = 0.1329 D.W. = 1.449
SAMPLE PERIOD: Sep.1996 - Mar.2003 except Apr. - Aug.

Notations:

C: Consumption Expenditure per capita in 2000 price
DEF: Consumer price index
POP: Estimated Total Population in Japan
Q1: Marketed Quantity of *Unsyu* Mandarins
P1: Marketed Price of *Unsyu* Mandarins
P2: Marketed price of Apples
P8: Marketed Price of Strawberries
P21: Marketed Price of Imported Oranges
TOUM: Degree of Sweetness
ZJ: Monthly Dummy Variables

● Economic Analysis on Distribution Costs of Food

Changes in the environment surrounding food distribution, such as diversification of food distribution channels and the increase in imported food, necessitate a reduction of food distribution costs in order to secure the farmers' income and to supply food to consumers at lower prices. This study is implemented to make clear the levels of distribution costs of agricultural, fishery and food industry products, effects of reducing these costs on consumer prices, and special characteristics of the Japanese food distribution system. This study

(1) The price formation factors of *Unsyu* mandarin (Fig. 1)

The price formation factors of *Unsyu* mandarins were analyzed by the estimation of the demand function using annual data.

The price of *Unsyu* mandarins in 2001 decreased by 35% in comparison with the previous year. The contribution by factor of this decline is as follows.

The quality (sweetness) factor :	20%
The population growth factor :	2%
The consumption factor :	-15%
The quantity increase (supply) factor :	-17%
The expected harvest quantity factor :	-25%

It became clear that the influence on consumption of deflation in the domestic economy was not serious. Important factors influencing price formation are the potential production and quality.

(2) The monthly price prediction of *Unsyu* mandarins (Fig. 2)

Monthly prices in 2002 were predicted by the following demand function using monthly data.

As for the estimated value by the demand function, actual values are almost traced. As for the average price in 2002, the actual data was 169 yen/kg, and the predicted value was 171 yen/kg.

List of Research Members

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is expected to be helpful in discussions about cutting down distribution costs.

The study consists of the following two sub-studies.

(1) Macro-economic Analysis of Food Distribution Costs

Estimation of margin rate (wholesale margin and retail margin) by using input-output tables reveals the following points.

Margin rates of food in Japan were:

- rising continuously from 1980 to 1995;
- however, not necessarily higher than manufactured products;
- slightly higher than in the United States,

but significantly lower for food industry products until around 1990.

When all of the distribution margins of agricultural, fishery and food industry products purchased by food industry, drinking and eating establishments and consumers falls by 1%, estimated reductions of consumer prices are 0.42% for agricultural and fishery products and food industry products, and 0.11% for drinking and eating establishments.

(2) Field Surveys on the Food Distribution System and Cost Structure

Under this sub-study two analyses are made: an analysis of the farmer's direct market and an analysis of purchasing behavior of consumers.

Comparing distribution costs including the transportation costs and sales commission in distributing some JA (agricultural cooperatives) products through the channel by way of farmers' shops managed by the JA, with those distributed through wholesale markets and re-

tailers, assuming transportation cost from shops to home borne by consumers is 40¥/kg in the case of farmer's markets, and 3 to 4¥/kg in the case of the wholesale markets and retailers. So it becomes clear that the distribution costs, when they include transportation costs borne by consumers, may be higher in the case of direct shopping at the farmer's market than the wholesale markets and retailers channel.

On the other side, a questionnaire survey on consumers' purchasing behavior in Fukuoka city reveals average time taken by consumers moving from home to shops is 6 minutes. Even in a region like Fukuoka city where cars are routinely used, consumers are reluctant to buy food at distant shops. Consumers' purchasing behavior in Japan is greatly different from in the United States, as Japanese consumers display frequent-small-quantity-purchasing behavior. Realizing a distribution system like that of the United States is not rational in Japan.

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List of the Research Subjects

Name of Subject	Name of Researcher
1. Studies on evaluation and food policies	
(1) Studies on the evaluation of agricultural, forestry and fishery policies	
Investigation and analysis regarding safeguard policies in other countries	Kentaro Katsumata, Takayoshi Horikoshi
Study on rice production control measures and needed policy reforms	Ryohei Kada
Study on the evaluation of farm income stabilization programs in the US and Canada	Kunihisa Yoshii
Studies on development and improvement of methods for the evaluation of MAFF programs	Kunihisa Yoshii, Kentaro Katsumata, Taiji Yoshida
(2) Studies on the evaluation of the environment for food, agriculture and rural area policies	
Development of a policy evaluation method regarding the promotion of the cyclic use of organic resources of agricultural origin	Kentaro Yoshida, Motoyuki Goda, Mitsuyasu Yabe, Takashi Hayashi
Studies on policies for mainstreaming recycling of organic resources and their effects on sustainable rural development	Akio Yamamoto, Mitsuyasu Yabe, Takashi Hayashi, Motoyuki Goda, Ryohei Kada
(3) Studies on the causes of changes in international and domestic food supply and demand and on forecasting of food supply and demand	
The development of a world food supply-demand model that takes into account environmental and/or resource constraint factors	Atsuyuki Uebayashi, Sotaro Inoue, Shunji Oniki
Development of a method for the evaluation of the vegetable price stabilization program by item analysis	Toshitaka Katsuki, Takaya Honma
Establishment of a quantitative method for the evaluation of the impact on domestic industries created by the increase of vegetable imports	Toshitaka Katsuki, Takaya Honma
Price prediction of Major Fruits using Demand Functions	Taiji Yoshida
Analysis of fruit prices and distribution costs	Toshitaka Katsuki, Satoshi Shimada
Studies on the market impact of food safety risks and incidents	Taiji Yoshida, Junko Kinoshita, Kyoko Sato

Name of Subject	Name of Researcher
Economic analysis on food safety and risks	Kunihisa Yoshii, Ryohei Kada, Mitsuyasu Yabe, Kentaro Yoshida, Takashi Hayashi, Koichiro Akashi
(4) Studies on food consumption trends and on food consumption policies	
Demand analysis of milk and milk products in Japan	Junko Kinoshita
Study on the development of risk communication methods related to food safety	Yuichiro Takahashi, Kyoko Sato
Comparative study on institutions and policies for food safety	Tomoko Ichida, Hiroshi Kondo, Takayoshi Horikoshi
(5) Studies on the efficiency and the stability of food supply systems from production to consumption and on related policies	
A study of market structure and its determinants in Japanese food manufacturing industries	Koichi Sato
Demand analysis of vegetables by intended purposes	Shigenori Kobayashi, Koichi Sato, Toshitaka Katsuki
Macro-economic analysis of food distribution costs	Tetsuro Yakushiji, Atsuyuki Uebayashi
An analysis of the food distribution system and cost structure	Koichi Sato, Yuichiro Takahashi
2. Studies on rural development policies	
(1) Studies on policies for the development of management structure and operation of agriculture, forestry and fisheries	
Clarification of the cost structure concerning agricultural corporations financed by local governments and agricultural cooperatives from the public viewpoint	Gentaro Suzumura
Study on local systems of farmland-use in villages	Tomoaki Ono
Econometric study on farm household behavior during the adjustment process of farmland transaction	Takeshi Fujie
Analysis of structural changes in rice-growing regions and factors in the revitalization of paddy agriculture	Noboru Hashizume, Junichi Ito

Name of Subject	Name of Researcher
Understanding the dynamic state of agricultural and rural structures and future prospects by analysis of agricultural census data	Osamu Chiba, Tetsuya Nakata, Toshitaka Katsuki, Tsutomu Matsuhisa, Gentaro Suzumura, Noboru Hashizume, Akira Egawa, Tomoaki Ono, Takeshi Fujie, Ryuichi Fukuda
Analysis of agricultural training systems corresponding to applicants for new entrants to agriculture	Akira Egawa
(2) Studies on policies for stabilizing farming, forestry and fishing communities and for improvement in welfare of farmers, forest workers and fishers	
Analysis of the revitalization mechanism in long-term nursing-care facilities in rural areas	Yoshihiko Aikawa, Tomoaki Ono, Osamu Chiba, Motoyuki Goda
Studies on the birthrate decline in rural communities	Tsutomu Matsuhisa
The study of reorganization of family relations and the rural community according to changes in women's way of living	Yoshihiko Aikawa, Noboru Hashizume, Tomoko Ichida, Masami Mizuno, Hitomi Nakamichi
(3) Studies on policies for economic revitalization in farming, forestry and fishing districts, hilly and mountainous areas	
Formulation of the index for rural revitalization and the development of a method of regional diagnosis	Noboru Hashizume, Gentaro Suzumura
Clarification of the co-operatives' roles for revitalization of rural economy	Osamu Chiba
(4) Studies on policies for conserving and the better use of resources in farming, forestry and fishing districts, hilly and mountainous areas	
A model of a recycling system for organic materials in rural communities	Motoyuki Goda
Prediction of trends in the use of regional resources including land affected by social and economic effects in rural areas	Takeshi Fujie, Akira Egawa, Ryuichi Fukuda
3. Studies on international policies	
(1) Studies on the trend of international relations regarding food, agriculture and rural areas and on international adjustment policies	

Name of Subject	Name of Researcher
Analysis of overseas movements in policy planning concerning the production, distribution and descriptive labelling of genetically modified agricultural products	Masami Mizuno, Yasuo Watanabe, Tsukasa Chiba, Masashi Tachikawa, Sotaro Inoue, Kyoichiro Adachi, Fumiaki Suda, Norio Fujioka, Mitsuyasu Yabe, Yoshihisa Aita, Ryohei Kada, Tetsuya Nakata, Akio Yamamoto, Yuichiro Takahashi
Studies on the potential food productivity in major world regions in consideration of environmental and resource constraints	Masami Mizuno, Takashi Okae, Junichi Shimizu, Kazuyoshi Shiraishi, Koichi Nobe, Toshitaka Katsuki, Shunji Oniki, Sotaro Inoue, Koichiro Akashi, Sou Ki, Satoshi Shimada
Some strategies of developing countries for the WTO and their agricultural development	Tsukasa Chiba
Study on the adaptation process of rural communities to social change in developed countries	Keiichi Ishii, Masashi Tachikawa, Fumiaki Suda, Tomoko Ichida, Koichi Nobe
(2) Studies on the trend of food, agriculture and rural areas and policy direction in Europe	
Analysis of the factors in rural revitalization and rural development planning for advanced nations	Motoyuki Goda, Yasuo Watanabe, Masashi Tachikawa, Tomoko Ichida, Junko Goto
A comparative study on the structure of policy making for European rural areas	Keiichi Ishii, Tomoko Ichida
Understanding production development in the former Soviet Union by comparative analysis of agricultural innovation	Koichi Nobe
Expansion of the “public zone” and agricultural policy planning	Fumiaki Suda

Name of Subject	Name of Researcher
(3) Studies on the trend of food, agriculture and rural areas and policy direction in the America and Oceania regions	
Clarification of overseas trends in production, distribution and consumption of genetically modified crops and the impact on the food system	Masami Mizuno, Yasuo Watanabe, Tsukasa Chiba, Masashi Tachikawa, Sotaro Inoue, Kyoichiro Adachi, Fumiaki Suda, Norio Fujioka, Mitsuyasu Yabe, Yoshihisa Aita, Ryohei Kada, Tetsuya Nakata, Akio Yamamoto, Yuichiro Takahashi
Clarification of the trading structure of agricultural commodities and trends in the Asia-Pacific region	Sotaro Inoue
Clarification of the trading structure of agricultural commodities and trends in Brazil	Junichi Shimizu
(4) Studies on the trend of food, agriculture and rural areas and policy direction in Asia and Africa regions	
Japan's new rural development cooperation	Masami Mizuno
Village structures and rural finance in Southeast Asia	Takashi Okae
Development of agricultural policies of overseas countries which grope for a survival strategy under the WTO system	Kyoichiro Adachi
An empirical study on township village enterprises in rural China and agricultural development	Junichi Ito
Econometric study on pastoral management and desertification of grassland in the Mongolia plateau	Shunji Oniki