

THE ABSTRACTS OF  
KREI REPORTS

2008

## PREFACE

In 2008, the Korea Rural Economic Institute carried out 108 research projects to seek new ways of revitalizing the Korean agriculture and rural communities. The research projects were defined based on the following five key research themes: production and distribution system to cope with changes in the consumer market, structural improvement and human resources development to raise the competitiveness of agricultural sector, farm policy transition in response to globalization, regional development to empower innovation capability in rural areas, and expansion of social safety net to cope with the diversifying populace in rural areas.

This abstract collection is a summary of core research results obtained from the research projects completed in 2008. The abstracts are published to help readers grasp key contents and promote wider readership among the people concerned.

The compiled abstracts are classified into nine sections based on the research tasks selected in line with the basic research direction of 2008. The nine research fields and the number of research tasks assigned for each research field are as follows: “The Impacts of Climate Change on the Agricultural Sector in Korea” (1st year of two-year project) and 19 other research tasks in the field of agricultural industry and economy; “A Study on Establishing Statistics on Agro-Food Loss and Waste” and 12 other research tasks in food policy; “Rural Policy Reorientation Scheme for Making Livable Rural Areas” (2nd

year of two-year project) and 22 other research tasks in rural development; “A Study on Risk Management Strategies for Specialized Farm Households” and 19 other research tasks in agricultural structure and business management research; “East Asian FTA and the Agricultural Sector” (2nd year of two-year project) and 15 other research tasks in international agricultural trade; “Agricultural Outlook for 2009” and 10 other research tasks in agricultural outlook and information; and “A Study of Modeling Supply-Demand System and Outlook of Korean Timber” and 9 other research tasks in forest policy research. In addition, “World Agriculture Online Reports” and “2008 Survey of Public’s Understanding of Agriculture and Rural Society” are compiled.

Great guidance and advice were provided by many people concerned and I am grateful to them for their full support. My thanks also go to the farmers who have actively participated in the survey and the researchers who have done their best despite difficult circumstances. I hope this abstract collection can serve as a beneficial guide for finding out more about the research reports published by our institute.

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AGRICULTURAL INDUSTRY AND  
AGRIBUSINESS RESEARCH

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## 1.1 Korea Agricultural Simulation Model

KREI-ASMO (Korea Rural Economic Institute - Agricultural Simulation Model) was developed by the Korea Rural Economic Institute in 1995, and has been used for mid- and long-term outlook as well as to analyze external shocks or various alternative policies for the Korean agricultural sector. The model is a partial equilibrium model that adopts a structural/recursive simulation method.

KREI-ASMO includes five sub-models: 1) sub-model for forecasting of macro-economic variables, 2) agricultural input price sub-model, 3) plants sub-model, 4) livestock sub-model, and 5) sub-model for agriculture macro variables.

This 2-year research project aims to upgrade the KREI-ASMO, and we named the new model KASMO (Korean Agricultural Simulation Model). The main features of KASMO are 1) replacing the supply and demand estimation for 18 large commodity groups to 45 specific commodities, 2) finding the equilibrium prices through simultaneous equilibrium of supply and demand instead of recursive method, 3) switching calendar year average to marketing year average of supply and demand for grain and fruits, 4) switching econometric equation to Cohort method to forecast agricultural population, and 5) each commodity group submodel can be operated independently, and aggregated and provided with feedback easily in the Excel spreadsheet.

Ex post simulation of KASMO was performed to test the fitness for the sample period of 2000~2006. The average root mean square percentage errors (RMSPE) are as low as 2% for the equations in the submodel of macro-economic variables, agricultural input, and the agricultural macro variables, so that the model fitness seems quite good.

The RMSPEs of the plant submodel may be considered as

acceptable. The average RMSPEs are less than 5% for the grain acreage equations except for wheat, less than 10% for the grain demand equations except for corn, and less than 3% for the grain import demand equations except for wheat. The average RMSPEs are less than 10% for the demand and supply equations of vegetables except for the import demand equations of cabbage and Chinese cabbage, acreage equation of fresh pepper, and demand equation of eggplant.

The RMSPEs of the fruits and special crops are poor. The average RMSPEs are less than 10% for the demand and supply equations of fruits except for the import demand equations of grape and persimmon, acreage equations of grape and tangerine, and demand equations of pear, peach and persimmon. The average RMSPEs are 10% for the acreage demand and supply equations of special crops except for the import demand equations of ginseng, green tea and mushrooms, acreage equation of green tea, and demand equation of flowers.

The RMSPEs of the livestock submodel are poor. While the average RMSPEs are less than 3% for the supply equation, those are more than 20% for the meat demand equations and 15% for the meat import equations.

Baseline forecast to the year 2018 was performed under the following assumptions:

- Tariff and tariff rate quota (TRQ) of 2005 stand still, except the TRQ of rice increased until 2014, and tariffed thereafter.
- Average exchange rate of 2008 of 1,050 won per US dollar, and the yearly average international crude oil price of 105 US dollars per gallon continues.
- GDP growth rate is quoted from the Global Insight forecast.
- World grain price is quoted from the FAPRI forecast.

The agricultural population is forecasted to decrease 3% per annum. While the nominal agricultural production will increase 0.8%, the value added of agriculture will decrease 0.1% per annum. Income per household from farming will increase

1.1% per annum, and non-farm income will increase 3.5%.

Two sensitivity analyses are performed to test the model stability. One is exchange rate shock, and the other is FTA shock.

If exchange rate will be 1,200 won per US dollar, which is 14.3% higher than the baseline, agricultural production in 2018 will inelastically increase 3.9% from the baseline as agricultural import will decrease. And the value added will increase only 1.7% as the main intermediate goods like oil will be imported more.

If we assume that the free trade agreement between Korea and US will start from 2010, agricultural production in 2018 will decrease 3.5% from the baseline as agricultural import will increase by tariff cuts. And the value added will decrease 4.7% as there will be less demand for intermediate goods than the baseline. The result is quite consistent with the recent analyses.

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## 1.2 Environment-Friendly Agro-Materials in Korea: Present and Future

Environment-friendly agro-materials are agricultural materials used in environment-friendly farming, not the fertilizers and agro-chemicals used in the conventional modern agriculture. The agro-materials commonly used in environment-friendly agriculture include organic fertilizers, compost, manure, organic soil, bio agro-chemicals, natural enemies, and bio micro-organisms. Nevertheless, it is difficult to clearly define the concept and scope of environment-friendly agro-materials. Moreover, the accompanying legal basis is inadequate. Many problems arose in the process of production, distribution and utilization of environment-friendly agro-materials. However, no significant effort has been made so far to examine and solve the problems. Since environment-friendly agro-materials are an essential element of organic agriculture, they are projected to be an important variable in the continuous advancement of organic agriculture in the future.

The '5-Year Plan to Promote Environment-Friendly Agriculture for 2006-2010' is the basic framework of the government policy to promote environment-friendly farming. It comprises projects that aim to support environment-friendly agro-materials. However, the scope of the current system and accompanying projects is limited and entails various problems in real life. The fundamental reason for such problems is thought to be attributable to the lack of comprehensive promotional contents and a long-term plan. Therefore, this study aimed to examine the current status of environment-friendly agro-materials and related problems ranging from the efficient utilization on the consumption side to the production and distribution on the supply side. The study also discussed the current situation and problems on the institutional side and presented measures to improve the problems



in all aspects.

In solving the problems found in the research, policy improvement is a prerequisite. As for the direction of the improvement, the concept of environment-friendly agro-materials should be defined within a legal framework while the laws and institutions that support the government policies should be systematically arranged. To alleviate the problems that arise from the production and distribution aspects of environment-friendly agro-materials, concerned parties need to play a proper role. In the first place, the government should 1) set up a direction to foster environment-friendly agro-materials and fix the overall policy and management system, 2) expand necessary financial aid, 3) coordinate conflicting policies during implementation, 4) reinforce management and supervision in partnership with private organizations and provide tailored support in different management stages, and 5) introduce a trademark system.

In the case of related organizations and groups, it is necessary for them to 1) seek ways to unify their own channels for importing raw materials, 2) improve competitiveness by strengthening voluntary management and supervision, and 3) delegate parts of its duties in cooperation with the government.

Individual firms should play adequate roles on the supply side of producing and distributing environment-friendly agro-materials. First, producing companies need to 1) actively take part in improving pending problems of the domestic agro-materials industry, 2) foster experts and improve product quality, and 3) secure credibility through improved after-sales management. As for distribution companies, they need to consider 1) mandating their workers to be enrolled in specialized educational programs of a certain level since they act as transmitters of information to farmers in the process of selling the products or 2) consider introducing a registration system for managing the sales outlets specializing in environment-friendly agro-materials. To alleviate the problems that may arise when using the agro-materials, they need to consider adopting programs

educating workers on related information and knowledge or set up call centers for accidents and damages. They could also consider adopting programs that reinforce the management of price and effect of environment-friendly agro-materials.

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### 1.3 Impacts of Climate Change on the Agricultural Sector in Korea

It is analyzed that, because of global warming, the average temperature has risen  $1.5^{\circ}\text{C}$  ( $1.9^{\circ}\text{C}$  in winter and  $0.3^{\circ}\text{C}$  in summer) for the past 100 years and winter has shortened while summer has lengthened, and thus advancing the flowering season in spring. As a result, the agricultural cultivation area has been extended northward and the damage by blight and harmful insects during the winter has increased, resulting in the decrease in agricultural productivity.

Scientific diagnosis and evaluation of climate change impacts on the agricultural sector is very important in establishing future visions of the agricultural industry and the direction of its policies. It especially provides useful information for establishing adaptive long-term regional agricultural plans.

The purpose of this study is to present a systematic and step-by-step strategy for the agricultural sector by making a diagnosis of the climate change and carrying out an in-depth analysis of its impacts on the agricultural sector. Of the 2-year project launched to achieve this purpose, the first-year study completed this year focused on analyzing the impacts of climate change on the agricultural sector, and the second-year study to be executed next year will present strategies for coping with the impacts based on the result of the analysis.

In this report, Chapter I presents an introduction covering the necessity of this study and a review of previous studies; Chapter 2 describes the actual conditions of climate change along with future prospects; Chapter 3 reviews a theoretical approach to analyze the impacts of climate change on the agricultural sector; Chapter 4 presents the agricultural industry's reactions to climate change based on the results of a survey of farmers and the people in charge of agricultural policies; Chapter 5 analyzes the impacts

of climate change on agricultural productivity and agricultural economy; Chapter 6 examines the cases of major countries such as Japan, US, and EU with regard to analyzing the impacts on the agricultural sector; and Chapter 7 summarizes and concludes this study.

The highlights of the study are summarized as follows:

First, according to the results of a climate change forecast by the National Institute of Meteorological Research (NIMR), it is suggested that the average temperature will rise 1.5°C by 2020, 3.0°C by 2050 and 5.0°C by 2080 from that of the past 30 years (1971~2000). As for the precipitation, it is estimated to have an increase of 5% by 2020, 7% by 2050 and 15% by 2080.

Second, the temperature rise due to climate change gives rise to new harmful insects, resulting in increased damages to crops. In particular, it appears that the damages caused by brown grasshoppers to apples, peaches, grapes and beans have increased. As for rice crops, the areas affected by rice stripe virus appear to have moved northward and spread all over the country.

Third, in order to identify the level of recognition of climate change, a survey was conducted on farmers and experts. According to the result of the survey, it appeared that the farmers had generally recognized climate change for 5 years and had been seriously worried about its negative impacts. It was shown that the experts had also recognized the negative impacts to a considerable extent. They expressed their deep concerns about the occurrence of harmful insects caused by global warming and said that the problems of abnormal weather conditions and water shortage are important issues.

Fourth, for the analysis of agricultural productivity under the influence of climate change, non- and semi-parametric kernel analysis methods were applied to rice, Korean cabbage, radish and apples based on the agricultural product and weather data obtained from the crops' major producing districts for the period from 1975 to 2007. In the case of rice, the most representative crop of Korea, a temperature rise of 1°C increased the yield of

rice per unit area (10a, approximately 1,000m<sup>2</sup>) by 24.4kg when the average temperature during the cultivation period was 19°C or lower. When the average temperature was higher than 19°C, however, the yield of rice per unit area decreased by about 6.2kg. It appeared that the productivities of Korean cabbage, radish, and apple were affected by different factors of crops and districts.

Fifth, to analyze the impact of climate change on the property of farm households, the Ricardian model was applied. The result showed that the rise of 1°C in the annual average temperature (12.4°C) brought down the price of farmland per ha by approximately KRW 14.5~19.2 million, which is equivalent to a 5.7~7.5% drop in the average farmland price. On the other hand, an increase of 1mm in the monthly average precipitation (110.8mm) was estimated to increase the farmland price per ha by KRW 330~360 thousand.

Sixth, on the assumption that the average temperature would rise by about 1.2°C in 2020 and the precipitation would increase by 11% (applying the forecast by NIMR) in the same year, it was estimated that the temperature rise would reduce the farmland price per ha by KRW 14.5~19.2 million; but the increase in the precipitation, on the other hand, is estimated to raise the farmland price per ha by KRW 4.0~4.4 million, thus resulting in the fall of about KRW 13.4~18.7 million per ha in farmland price.

Lastly, according to the Ricardian analysis of the impact of climate change on the property of farm households, it appeared that the temperature rise in April had a positive influence on the farm household's total income whereas it had a negative influence in August and December. When such seasonal influences were considered collectively, it was shown that the temperature rise of 1°C reduced the farm household's total income by KRW 2.6~4 million per ha, equivalent to about 15~23% of KRW 17 million of the average farm household's total income. This implies that climate change has a bigger impact on the farm household's total income than on the farmland price.

When the Ricardian analysis results of the economic impacts of climate change on the agricultural sector were put together, it appeared that climate change, including both temperature and precipitation, had predominantly negative impacts as suggested by previous studies conducted by major countries. Therefore, in order to minimize negative impacts of climate change, proper adaptive measures are needed, which include insurance system for risk management, breed improvement, introduction of new breeds and modification of cultivation methods. Based on the results of the impact analysis conducted in the first-year study, the second-year study will focus on developing core policies and phased-out implementation strategies (short-, mid- and long-term strategies) to effectively cope with climate change.

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## 1.4 A Study of Strategies to Promote Premium Brands of Agricultural Products

This study is designed to draw up strategies to promote premium brands of agricultural products. For this purpose, the study analyzed the current status of domestic brands of agricultural products, conducting both a survey of consumers' attitude toward domestic agricultural product brands and case studies of domestic and imported premium brands of agricultural products.

Chapter 2 summarizes the theoretical definitions of brand and brand equity. On top of that, this chapter shows a strategic management process of agricultural product brands. The management process is divided into 4 steps: brand development and promotion (step 1), brand positioning and brand value constructing (step 2), planning and conducting of an integrated brand marketing program (step 3), and the growth and maintenance of brand equity (step 4).

Chapter 3 introduces the current situation of and domestic policies for agricultural product brands. On the basis of previous results, general problems of and government policy mistakes on agricultural product brands are drawn. As the domestic market structure is rapidly changing into an oversupplied market, the branding of products is being pursued as the core means of differentiating products. However, the current domestic branding strategies come short of building a solid foundation and do not meet necessary conditions.

Chapter 4 analyzes consumers' attitude toward domestic agricultural product brands and describes their problems from the standpoints of consumers and marketing companies. The result of an analysis on consumers' purchasing pattern shows that the most important source of information consumers turn to in purchasing agricultural products was the recommendation of acquaintances. With respect to product factors affecting the purchase, it was

shown that in the case of rice, consumers chose a product brand after carefully considering the place of origin and product safety. In the case of fruit, consumers' primary concerns were freshness and sugar content. However, more than 65 percent of surveyed respondents said that they do not buy same brand products repeatedly. This shows how insecure consumers' brand recognition and loyalty toward agricultural products are.

Chapter 5 presents case studies of domestic and imported premium brands of agricultural products. When domestic brand products are compared with imported ones, it was shown that domestic product brands fared poorly with respect to management system, marketing strategy, and education of producers.

Chapter 6 suggests promotional strategies and measures to build premium brands of agricultural products. In order to foster premium brands, it is necessary to 1) build a solid managing organization with a powerful driving force, 2) determine a suitable promotion type and a scale, 3) design a rational promotion system, 4) develop differentiated brands, 5) construct a quality management and control system, 6) secure effective marketing strategies and integrated managing ability, and 7) develop efficient coordination with related organizations. On top of that, even though the roles of producers and local governments are absolutely important, it is necessary for the government to amend the current support policies.

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## 1.5 A Study on the Present State and Development Strategies of Duck, Honeybee, Goat, and Deer Industries

This study focuses on duck, honeybee, goat, and deer industries that have not attracted much interest from the government and researchers. Known as “specialized” livestock, these livestock animals are relatively uncommon compared to cattle, hog, and poultry. Although the industries are believed to be not so important, many farms in fact own such livestock and earn a considerable income from them.

Since only a little research was done on these industries, this study conducted field surveys and interviews on farmers, producers’ associations, and other related institutes. This study also performed consumer surveys on each industry to confirm how consumers consume and spend their money on the industries. After gathering available information from the interviews and surveys, this study conducted a SWOT analysis to show how the industries can be improved in the future.

The so-called specialized livestock industry has several advantages as an industry. First, the industry is well adjusted to the Korean climate and geographical conditions. Second, there is the growing food industry and the chance to introduce new meat products. Third, the industry has its own virtues of requiring less labor, acquiring mixed feed, and discharging less excretion compared to common livestock.

This study identified several weak points of the industry such as less systematic industry structure, weak disease control system, low level of animal improvement, low political power of producers’ association to realize its own interests, and so on. With all the consideration, this study provides different strategies to each industry

for future success. For example, the duck industry needs to follow a path of integration to be a leading industry. The honeybee industry has to be prepared to overcome DDA and FTAs with structural reform, develop new markets, and focus on food safety. The goat industry needs to make the most of the growing consumers' interest in goat products and make them a part of the usual meal. The deer industry has to focus on how to gain a firm foothold in the market with rational process and distribution channels.

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## 1.6 Consumers' Attitudes and Marketing Strategies for Environmentally Friendly Agricultural Products

The supply of environment-friendly agricultural products (EFAPs) is on an increasing trend, but the consumption rate of the products does not match the supply due to high premiums and safety concerns. Recently, the overall domestic market is rapidly changing into a consumer-oriented market with the consumers' preference for branded produce, large retailers, and e-commerce increasing. In order to cope with the marketing shift and develop environmentally friendly farming, marketing strategies should be properly prepared on the basis of consumption trends, purchase patterns, and the interlinked sectors of production, distribution, and consumption.

The purpose of this study is to present marketing strategies for stimulating the consumption of EFAPs based on consumption trends and purchase patterns. To this end, an online survey was carried out on 1,000 housewives living in the capital region and five metropolitan cities.

The contents of this report include the following: Chapter 1) the purpose, scope, methods, and necessity of study and previous studies; Chapter 2) trends of production volume and pricing, distribution situation, and the market volume of EFAPs for 2020; Chapter 3) consumption trends and purchase patterns, and marketing conditions based on the survey results; Chapter 4) basic directions for revitalizing the market, purchase strategies, shipment in producing areas, and marketing distributors and policies; and Chapter 5) summary and conclusion.

The volume of certified EFAPs recorded 35,406 tons in 1999 and 1,785,874 tons in 2007, up about 67 times compared to the base year with an annual increase rate of 69% on average. The prices vary depending on certification types and distributors. Compared to conventional agricultural products, the average price

of EFAPs amounted to two times for onions, 1.8 times for cucumber and tangerines, 1.6 times for rice and pepper, and 1.5 times for lettuce and tomatoes.

It is assumed that the market volume of EFAPs reached about 1.9 trillion won in 2007, a 45% increase from the previous year to account for about 6.2% of the overall market volume of agricultural products. It is estimated that the volume will roughly amount to 2.4 trillion won in 2008 (a 24% increase from the previous year), 2.9 trillion won in 2009, 2.1 trillion won in 2010 (a decline from the previous year due to the scheduled abolition of the need to certify low-pesticide products), and 6.1 trillion won in 2020 to account for 20% of the overall transaction amount of the agricultural retail market in the same year.

The major targeted consumers are middle-class consumers in the 40s and 50s in Seoul and metropolitan areas and large-income earners in the 20s and 30s; and EFAPs are being purchased at hypermarkets (45%), discount stores (21.8%) such as Hanaro Club and Hanaro Mart run by agricultural cooperatives, specialty stores of organic products (10.8%), department stores (5.6%), and through direct trading (6.7%).

The consumers seemed to be hesitant to purchase EFAPs mainly due to higher prices (45.5%) and low confidence in the production and distribution process (31%). Some consumers (59.9%) preferred branded products, but others (40.1%) did not. This report shows that consumers prefer brands from famous producing areas, choosing specialty stores for grains, large distributors and consumer groups' retail shops for vegetables, and specialty stores and cooperative discount stores for fruit.

The most important tasks in exploring marketing channels for EFAPs are to extend the supply of EFAPs to schools for meal services (58.1%), develop processed foods using organic materials (9.5%), and encourage promotional activities (3.6%). The consumers preferred to get information on EFAPs through TV and radio (27.3%), hypermarkets (24%), the Internet (20.3%), and newspapers and magazines (11.5%).

According to the survey, most respondents thought that the EFAP exhibitions or events, which were held by the central or local governments to promote the consumption of EFAPs, are helpful: 6.1% of the respondents said they are very helpful, and 42.3% thought the events to be more or less helpful while 38.6% said they are helpful in a moderate way.

The key tasks for stimulating the demand for EFAPs are outlined as follows: classification of buyers (segmentation of markets), provision of information and safety assurance, labelling of brands and reference prices, shopping convenience for consumers, and low pricing.

In order to motivate consumers to buy more EFAPs, the products' safety should be verified and they should be made to sell at specialty stores and department stores.

To lower the prices of EFAPs, production units should be systematized to improve marketability and reduce the costs. The marketability should be raised through the standardization of environmentally-friendly farming, and the costs should be lessened by joint purchase of environmentally-friendly resources. Consumers appraise the reliability of products based on suppliers (distributors), and they prefer the brands of large distributors; thus it is necessary to use agricultural cooperatives in producing and consuming areas for popular marketing. The suppliers should set up marketing strategies on consumer trust, special handling of EFAPs, and convenient shopping in cooperation with themselves.

The certification system should be thoroughly managed, and a history tracking system should be established to ensure consumers' trust on EFAPs. The production and distribution sectors should take measures to ensure that the prices are lowered by 20~30%. A distribution center should be built to reduce distribution costs, raise reliability, and revitalize the wholesale and retail sectors. Agricultural cooperatives should play their respective roles in maintaining the premium and exploring marketing channels in producing and consuming regions.

Meal services at schools play an important role in

exploring marketing channels for EFAPs. Many parents could afford to pay a 10% overcharge if EFAPs are used for lunch at schools, and the plans should be properly prepared and carried out.

Taking into account the fact that agricultural products are less consumed in Korea nowadays, EFAPs will drive consumers to purchase more of the products if their safety is verified and if the premium is maintained at a reasonable level. For the continued consumption of EFAPs, marketing strategies should be established based on a consumer-oriented marketing environment, and feasible programs should be carried out accordingly.

It is necessary that policy makers, producers, consumers, academic researchers and distributors play their respective roles in developing feasible programs for marketing EFAPs. The survey showed that the roles and brands of agricultural cooperatives are very important in consumer markets. Innovative plans are under deliberation by a number of groups, and if the groups can serve as the key leader in implementing marketing strategies for EFAPs, they will greatly contribute to the development of environmentally-friendly farming and to raising their standings.

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## 1.7 Case Studies on Customer Oriented Marketing of Agricultural Produce

The purpose of this study is to provide useful information about customer-oriented marketing of agricultural products for farmers' marketing organizations.

Marketing is the process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods and services, organizations, and events to create and maintain relationships that will satisfy individual and organizational objectives. Customer-oriented marketing is evolved from production-oriented marketing which appeared in the late nineteenth century and sales-oriented marketing.

Customer-oriented marketing is all those associated with the identifying of particular wants and needs of a target market of customers, and then going about satisfying those customers better than competitors. This involves doing market research on customers, analyzing their needs, and then making strategic decisions about product design, pricing, promotion and distribution.

The main methods of analyzing customer-oriented marketing are summarized as follows:

First, if customer-oriented marketing sufficiently satisfies customers' needs, a new product to be introduced in a market can be developed through simple manufacturing only.

Second, the chance that customer-oriented marketing can create a market could be fostered by quickly recognizing and corresponding to the discordant between necessity and market.

Third, in order to meet customer preference, it is effective to magnify the range of customers' selection and differentiate the quality and prices of products.

Fourth, it can create a new value by delivering information about production and distribution to the customer.

Fifth, it can maximize customer satisfaction by selecting distribution channels properly according to the needs of customers and characteristics of goods.

Lastly, in order for customer-oriented marketing to grow continuously, it is necessary to construct an efficient management system that can properly respond to market changes.

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## 1.8 Economic Impacts of and Countermeasures to Highly Pathogenic Avian Influenza

The purpose of this study is to estimate the economic impacts of HPAI (Highly Pathogenic Avian Influenza) and discuss how to improve the current animal disease surveillance system. This study finds that the economic loss from the outbreak of HPAI amounts to more than 630 billion won. This amount includes losses from all related industries and fields.

This study also reviewed the current animal disease surveillance system of Korea. Introducing an early warning system for HPAI is important to reduce the potential loss that can be caused by an HPAI outbreak. Several systematic changes are recommended to establish an early warning system.

This study consists of five chapters. Chapter 2 introduces cases of HPAI outbreaks and HPAI surveillance system. Chapter 3 calculates economic losses from HPAI and Chapter 4 discusses ways to improve the current surveillance system. Finally, Chapter 5 recommends several policies for reducing the economic impacts of an HPAI outbreak.

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## 1.9 Measures for Coping with Drastic Changes in Agricultural Input Prices

In 2008, agricultural input prices including those of fertilizer and livestock feed have surged dramatically mainly due to increases in international oil and raw material prices, and the devaluation of the Korean currency. In turn, the farm management cost for major products also significantly went up. As a result, it is expected that the condition of farm economy has worsened compared with those of other years.

This study is carried out to analyze the trend of agricultural input price, find out the factors contributing to the changes in agricultural input prices, and suggest selective countermeasures. The major findings of this study are as follows:

First, most of agricultural input prices have increased at a fast rate especially after 2005. The prices of fertilizer, fuel, and livestock feed, in particular, rose at a relatively higher rate.

Second, the share of prime cost in product sales ranged from 74% to 84%. Most raw materials of agricultural inputs are imported, which makes agricultural input prices vulnerable to changes in the international price of raw materials including feed grain and exchange rate. Accordingly, the level of international price of raw materials, as well as exchanges rates, heavily influences agricultural input prices. This point was also confirmed by the simulation results of the impact of changes in international fuel price and exchange rates on agricultural input prices.

Third, it is suggested that immediate or short-term measures for cushioning the shock caused by drastic changes in agricultural input prices are needed continuously. Strengthening the agricultural input industry through structural adjustment and expanding agricultural input export are also emphasized.

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## 1.10 Analysis of Policy Linkage and Evaluation Using Agricultural Environmental Indicators

Agricultural environmental indicators refers to what is related to environmental factors such as soil, water and air which are absolutely essential for farming, and is systematically and comprehensively incorporated into the agricultural environmental resources indicators system. It is necessary that the system be established for solving agriculture related problems and for promoting sound eco-friendly farming. This study is intended to address the question of how the policies concerning agricultural environmental indicators should be applied.

This report consists of the following chapters: Chapter 1 presents the necessity, purpose and scope of the study including a review of previous studies; Chapter 2 introduces the concept and system of agricultural environmental indicators; Chapter 3 presents a diagnosis of the environment's status using agricultural environmental indicators; Chapter 4 analyzes the policy linkage using agricultural environmental indicators; Chapter 5 evaluates environmental policies using agricultural environmental indicators; and the final Chapter 6 suggests directions for future work.

In brief, the major findings of the study are described as follows:

First, a survey was conducted to determine how land utilization indicators are being applied by the users; it is shown that farmers mostly use the data on optimal cultivation of land, and policy makers the data on land use areas by land category, and specialists the optimal cultivation of land and cultivation areas.

Second, in regard to what extent the land related data is being used, farmers are found to be using mostly the data on soil fertility, nutrient contents, chemical residues, and heavy metal contents, whereas administrators use mostly heavy metal contents

and chemical residues; and specialists soil fertility, nutrient contents, and heavy metals. Soil data was utilized at the following intervals: one year for nutrient contents, 2 to 3 years for heavy metal contents and soil fertility, and 4 to 5 years for the distribution of microorganisms in soil.

Third, regarding nutrients, this study shows that farmers and administrators mostly use data on chemical fertilizers and excess nutrients. Nutrient data was referred to at the following intervals; one year for consumption of chemicals and numbers of livestock, and about 2 to 3 years for others.

Fourth, it was examined how much farmers contributed to providing agricultural resources indicators: farming practices accounted for 35.6%, environmental perception 29.2%, local environmental evaluation 23.5%, and consumer promotions 10.2%. The agricultural environment resources indicators are provided to farmers through various means: farming techniques related institutions (50.5%), farmers and eco-friendly agricultural organizations (22.3%), agriculture journals and articles (16.8%), internet (5.0%), etc.

Fifth, agricultural environmental indicators are applied locally through the soil indicators system (of physical and chemical properties of soil, optimal cultivation areas, and soil fitness) provided by the National Institute of Agricultural Science and Technology (NIAST) and the rural topography and integrated farmland indicators system by the Ministry of Agriculture and Forestry (MAF) and Korea Agricultural and Rural Infrastructure Corporation (KARICO) for the efficient conservation and management of farmland.

Sixth, foreign cases of using agricultural environmental indicators are as follows: geographical positioning system for farming and rural development by the Japanese Ministry of Agriculture, Forestry and Fisheries and the soil indicators system (including surveys of soil) by Agriculture & Environment Technology Research Center in Japan; STONE model of the Netherlands for the extensive management of nutrients; and the

IRENA Project initiated by the European Environment Agency for the integrated management of agricultural environment concerns in 15 EC countries.

Seventh, approaches to agriculture and environment related policies include utilization of simulations and DSR, (drive-status-response) provided by the OECD. Policy models were evaluated using agricultural environmental indicators: directional non-circular graphics and standardized agriculture and environmental models discussed by OECD Agriculture & Environment Agency.

Eighth, an agricultural environmental indicator was presented by comparing farming conditions among OECD members, and pre- and post-evaluations of agricultural environmental policies were reviewed by using agricultural environmental indicators. A nutrients loading system was presented by using nutrient purchase and consumption indicators.

Lastly, for an agricultural environmental policy to be effective, it is necessary to appropriately assign roles to administrators, experts, and farmers. Administrators need to have interest and provide financial support to R&D so that reliable and highly practical agriculture and an environmental indicators system can be established.

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### 1.11 Study on the Development Strategies and Protection of Intellectual Properties in Korean Agriculture

This study's objective is three-fold: review the institutional aspects of intellectual property rights and the genetic resources situation, evaluate the economic value of intellectual property rights in agricultural sector, and suggest strategies to develop and protect intellectual property rights. The main intellectual property rights in agricultural sector include patents on plants, protection of new plant varieties and geographical indications.

The plant variety protection was established by the Seed Industry Law along with the 1991 UPOV Act. The purpose of the Law is to develop the seed industry and stabilize agriculture, forestry, and fishery by enacting provisions regarding protection of breeder's rights, management of variety performance, seed production, certification, marketing, etc. The National Seed Management Office was reorganized in 1998 as an implementing agency for plant variety protection.

The economic values of plant patents and geographical indications and trademarks for specific crops were evaluated by econometric methods. For example, this study estimated consumer's marginal willingness to pay for geographical indication of Seongju melon. The result indicates that the estimated marginal willingness to pay for geographical indication is very meaningful. Consumers are willing to purchase products with geographical indication even if the price is higher than ordinary agricultural products. Therefore, it can be concluded that consumers have a very high reliability towards geographically indicated products.

The concerns for intellectual property rights are increasing in the agricultural sector, thus making it necessary to seek policies protecting intellectual property rights. Accordingly, this

study suggested strategies to strengthen the protection of new plant varieties, apply R&D results for agricultural production, and promote the geographical indication for regional economy.

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## 1.12 A Study on the Systematization of Regional-Based Recycling Agriculture

Currently, a large amount of agricultural by-products, household waste and various other waste materials are produced in agricultural regions. These waste resources can be used to promote environmental preservation, develop alternative energy, enhance the industry-agriculture linkage, and ultimately strengthen the system for local self-reliance. Lately, the Resource Recycling Agricultural System has been recognized as an effective alternative for the reuse and recycling of resources.

The purpose of this study is to develop a recycling system centering around local farming including rice cultivation, dry-field farming and livestock farming for resource conservation, ecosystem protection, and the production of safe agricultural products through the recycling of organic materials.

To build the Resource Cycling Agricultural System, it is necessary to establish a strong link among those who produce by-products, those who recycle them into new resources, and those who use them. At present, agricultural by-products are widely generated in each local area. However, it is difficult to collect and make use of them for economic gain. Furthermore, no proper linkage is established between suppliers and users.

Secondly, it is necessary to develop technologies that can facilitate the conversion of agricultural by-products into fertilizer, feed, gas and alternative fuels.

Finally, it is also important to establish a utilization system based on the by-products and main crop products in each local area.

Local agriculture must be actively pursued and supported first to facilitate this process. Thus, it is crucial to maintain close cooperation and coordination between agricultural communities and organizations by developing local leaders and setting up goals

that are suitable to the local situation.

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### 1.13 A Study on the Construction of an Exclusive Auction Market at the Ojeong Agricultural and Marine Products Wholesale Market

Twenty years have passed since the opening of the Ojeongdong Agricultural and Marine Products Wholesale Market in Daejeon. Because of the old facilities, the market's fundamental problems cannot be solved by partially repairing the facilities. Also, the demand for new facilities such as low temperature and packing facilities makes it necessary to establish a comprehensive systematic plan for improving insufficient facilities.

Consequently, this study was conducted to improve the O-jeong wholesale market as a wholesale distribution center in the central Daejeon. This study presents a development direction for the wholesale market by accurately analyzing and predicting the role changes in the future. The study was carried out to improve the facilities and make them suitable for a more convenient and sensible shopping culture, so that it will contribute to the creation of new product values alongside a reduction of physical distribution cost. Another aim of this study is to increase producers' income and promote the advancement of civic life in the city. The O-jeong market which quickly supplies fresh and safe agricultural produce will provide good services to producers and consumers.

The objectives of this study are as follows:

- 1) To present a development direction for the wholesale market by accurately analyzing the agricultural product distribution system in Daejeon and by accurately predicting the market's role changes in the future.
- 2) To design basic strategies for improving outdated and insufficient facilities and secure the market's adequate functioning and convenient shopping culture.

- 3) To formulate a reasonable plan to improve the wholesale market facilities and operate them more efficiently.

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## 1.14 Sustainable Development Strategies to Cope with Climate Change

As a result of climate change, the main production areas of agriculture are changing, affecting the productivity and quality of crops. And the damages by blight and harmful insects have increased and the agricultural ecosystem is disturbed. After all, the method and time of cultivation, fertilization methods, irrigation management, and crop species will be changed. The purposes of this research are to analyze the impacts of climate change on agriculture, livestock, forestry and the regional festival of Hwacheon and to derive long-term countermeasures.

The main contents of this research are as follows: the present condition and the prospect of climate change at home and abroad, impacts of climate change on agriculture, the current condition and the future outlook of Hwacheon's main products, pending issues of Sancheoneo Festival and methods to improve the event, and its future direction.

This research also investigated farmhouses cultivating the main crops of Hwacheon and tried to grasp changes in production amount, income, the damage level caused by blight and harmful insects, flowering time, harvest time, etc. due to climate change.

The Sancheoneo Festival, which takes place every year in Hwacheon, was the first of all "festivals" held in Korea and it is the country's most popular winter festival. But the change in ice thickness due to the recent rise in temperature has raised concerns that it would threaten the festival's success. So, this research proposed strategies for the sustainable development of the festival.

Finally, we recommended the following policies to prepare for climate change: installation and operation of AWS (Automatic Weather System), use of insect resources, setting up of plans to better coordinate and strengthen government policies for global warming adaptation, and establishment of mid- and long-term countermeasures.

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### 1.15 Consulting on the Revitalization of Kimchi Business Operated by Agricultural Cooperatives

The purpose of this study is to suggest management strategies for revitalizing the kimchi business operated by agricultural cooperatives. The main research topics include the situation of domestic and global kimchi markets, prospect of the kimchi industry, actual conditions of production · marketing · logistics · management of kimchi by agricultural cooperatives, brand marketing and problems faced by the cooperatives, rational direction and differentiation of the cooperatives' kimchi business, appropriate strategies for brand marketing, and rationalizing the physical distribution of the cooperatives' kimchi business.

In Korea, eleven agricultural cooperatives have established and managed kimchi factories from the mid-1990s. But these cooperatives could hold only 5.1% of the Korean kimchi market. Moreover, the amount of kimchi imports has been increasing annually in recent years due to the opening of the Korean domestic market to foreign products. As a result, the cooperatives' kimchi business is facing a critical period.

The direction for rationalizing the agricultural cooperatives' kimchi business can be summarized as enlarging the scale of kimchi business, setting up of brand marketing strategies, raising the market share, reinforcing the market power and increasing kimchi exports. The market share forecast of the cooperatives' kimchi business in the domestic market is set at 12.2~17.1% in the years after 2009. Therefore, the National Agricultural Cooperatives Federation should not participate in the business of producing kimchi but play an appropriate role in revitalizing the kimchi business of regional agricultural cooperatives by assisting them to increase their competitiveness.

The direction of management strategies for the production sector can be summarized as follows: systematize all the kimchi

business of agricultural cooperatives, develop a shared brand, construct a production system connecting farmhouses, diversify products and satisfy consumer needs. The management strategies for the distribution sector can be summarized as ‘integrate distribution strategies,’ ‘develop a joint brand,’ ‘convert into a suitable distribution system for joint brand marketing,’ ‘open up a new market,’ and ‘promote efficient and integrating distribution.’

The direction for differentiating the kimchi brands of agricultural cooperatives is called ‘masstige’ (mass + prestige = masstige) and it refers to the integration of quality, prestige and popularity.

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## 1.16 A Feasibility Study for Building an Agricultural Distribution Complex in Gyeongnam Province

The global environment for the production and distribution of agricultural products has been embracing new changes from the rapid restructuring of industries. In contrast to this, however, the Korean agriculture and rural communities that center around small farms without suitable countering powers are facing an increasingly tough environment under stiff market competition.

As the liberalization of the domestic market to imports has been accelerating since 1990 together with the opening of the distribution market, a competition system among various distribution channels and players is formed at the consumption level, calling for a new supply system and changes at the production level. In other words, as the distribution system of current suppliers crumbles and as the market rapidly restructures around consumers and distributors, activities that can enhance the bargaining power of producers in the distribution market are needed to cope with these changes.

The provincial government of Gyeongnam plans to bring about an economy of scale by optimizing the farming scale of each crop item and production area. In doing so, it seeks to raise the attractiveness of products and added values by integrating small and scattered distribution centers under a zone system through the realignment of their functions. In addition, the local government plans to increase the product value of agricultural products and farmers' income by increasing their bargaining power and by branding products.

This study examined the feasibility of building an agricultural distribution complex in the Gyeongnam region and presented directions for the deployment, management, and operation of proper-scaled facilities for conducting efficient distribution functions.

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### 1.17 Policy Programs for Introducing a Direct Payment System for Organic and Antibiotic-Free Livestock Products in Korea

A direct payment system to promote environment-friendly livestock products was adopted as a pilot project for 2004 to 2006. However, the project was held back in 2007 due to the inactive participation of livestock farmers and an ill-prepared certification system of organic livestock products. With the increasing interest in safe agricultural and livestock products and growing adoption of eco-friendly livestock policies, a certification system was introduced in 2001 for organic livestock products, and it was extended to cover antibiotic-free livestock products in 2007. Taking these shifts into consideration, it is necessary to adopt a direct payment system to promote organic and antibiotic-free livestock products and foster farmers raising livestock that are environmentally friendly.

The objectives of this study were to estimate the costs of supporting a direct payment system and to present programs that can activate the system in the four livestock categories of Korean cattle, dairy cattle, pigs and poultry (laying or breeding species).

This study has found that the certification of organic livestock was made evenly nationwide in the case of laying poultry, but higher issuance of certificates was shown in specific areas for Korean cattle, dairy cattle and pigs. Certifications of antibiotic-free livestock were made nationwide in the categories other than dairy cattle and pigs. In addition, this study has found that significant quantities of certified antibiotic-free livestock were handled in the same manner as in ordinary livestock breeds, and the estimated market for all certified organic and antibiotic-free livestock products reached an annual market value of 280 billion won to 350 billion won.

An in-depth survey was made on eco-friendly livestock

farming households to examine the production and estimate the unit cost of direct payment. Purposive sampling was applied to select suitable farmers for this purpose.

The unit cost of direct payment per head was calculated for all products considering the income levels and proportions of production cost charged on ordinary livestock farmers and producers of organic/antibiotic-free livestock, and the unit costs were found as follows: 30,000 to 50,000 won for antibiotic-free beef and 250,000 to 350,000 won for organic beef; 10,000 to 20,000 won for antibiotic-free pork and 30,000 to 50,000 won for organic pork; 100 to 200 won for antibiotic-free laying poultry and 1,000 to 2,000 won for organic laying poultry; and 50 to 100 won for antibiotic-free breeding poultry and 200 to 300 won for organic breeding poultry.

Three basic policy suggestions were made to implement a direct payment system for organic and antibiotic-free products: first, the unit cost should be appropriately determined to ensure livestock farmers' eco-friendly farming; second, supplementary alternatives should be sought to determine whether the pilot project can be continuously carried out in its actual, full-fledged implementation stage; and third, considerations should be made to maximize the policy performance with relevant policies.

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## 1.18 Food Insecurity; Its Factors and Countermeasures in a National Perspective of Korea

Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food. To achieve national food security, a country must be able to grow sufficient food, have enough foreign exchange to enable it to import food, and have sufficient buffer stocks.

The food crisis in 1973 was mainly caused by the shortage of wheat production in the former Soviet Union, and it took a decade to recover. The recent sharp price increase of 2007/2008 is caused mainly by the demand shift for feed grain in China, ethanol use in US, and an increase of speculative demand for international hot money. These demand-pull factors may continue for a decade or longer, and grain prices are forecast to stay high with fluctuations. On the contrary, grain prices may fall if the world economy slumps.

Korea experienced several economic crises: the bad crop in 1980 and the foreign exchange crisis in 1997. Countermeasures against such national financial crisis, bad crops, or sudden unification with North Korea are needed.

Prices of domestic grain used to be four to five times higher than the import prices. As the international prices went up, the price gap fell to less than two times. Furthermore, domestic consumers are willing to pay more for domestic grains, and domestic production of grain is now somewhat competitive. The self-sufficiency ratio of grain decreased to 27.2 percent in 2007. The plantation of wheat, barley and green manure crops in the winter season after the harvest of rice may increase the self-sufficiency ratio up to 30 percent. The demand for land for urban and industrial use is projected to be 385,000 hectares up to 2020. The supply capacity of land except the arable land is

678,000 hectares which exceed the demand.

In buying and selling of public stockholding of rice, the government may operate a formula to minimize the probability of shortage as well as overstock. And the public stockholdings of wheat, corn and soybean are needed.

Private trade companies or the National Agricultural Cooperatives Federation are encouraged to enter into international grain trade in the spot market and futures market. Premium rice may be exported to the US, Japan and China in the future. The Uruguay Round agreement for agriculture is generous for export ban, while it is very strict for import ban. It should be discussed in the World Trade Organization.

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### 1.19 A Study on Developing Alternative Policy for Stably Securing Grains: Early Warning System and Overseas Agricultural Investment

The purpose of this study was to explore alternative policies for stably securing grains in Korea against an unbalanced supply and demand or high prices of world grains.

The production and consumption of world grains is on a steady increase. While the consumption has increased without much fluctuation, the production has been undergoing a radical change every year. The quantities of world grain production and consumption are expected to grow continuously in the long run. However, the conditions for the supply and demand of world grains have gotten worse recently. Since the increase of world grain consumption and the instability of world grain production in the 2000s, international grain prices have increased rapidly from 2006.

In this situation, according to a result of stability tests for the production and futures market prices of world grains, the world production, as well as futures market prices, was analyzed to be all unstable. Although world grain production has increased, there are still factors contributing to the unstable production that influence international grain price. Hence, it is difficult to foresee how rapidly the world supply and demand of grains and the price will change.

Lately the self-sufficiency of grains in Korea has remained at about only 27%, and the rest of the grain supply has relied on imports. Thus, it is necessary to have a plan at the national level to guarantee stable supply of grains, such as the extension of domestic grain supplying capacity and a sustainable supply from overseas and so on.

It is also significant to develop a system that can provide grains on a timely basis by establishing overseas grain marketing

facilities and facilitating overseas grain production for the future. Another possible scheme to raise the self-sufficiency is to extend domestic grain production by utilizing domestic agricultural resources such as land. By doing so, it can provide consumers with domestic agricultural products of good quality and price.

As the domestic supply and demand of grains is affected by situations abroad, it is essential to build a system that can monitor the world grain market and inform the risks in advance. So, we developed an early warning system. The early warning model produced complex leading indices and indicators of world grain price through the signal approach.

According to the precedence of the complex leading index through the lag coefficient of correlation, the complex leading index seemed highly relevant to the risk index with a time lag of 1~6 months. Thus, the early warning system model of grain price was approved to be reliable. Following the result of the model analysis, the level of the early warning was divided into 5 steps with specifications per each step and the overall standard of a counter plan.

To prepare for the instability of the world grain balance and a sudden rise of the price, many companies and agriculture related associations have been promoting overseas development of agriculture for the sustainable supply of grains only to be faced with repeated trials and errors. Therefore, Korea's grain marketing companies need to participate in the international grain market in stages before fully engaging in the development of agriculture overseas. It is important to know that the international grain marketing industry is a business particularly for making profits in the course of repeated fails and successes.

In the long term, there is a necessity to produce grains in the overseas for domestic utilization and diversify countries Korea imports grains from so that it can prepare for possible food crisis in the future.

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## 1.20 Performance of the Project for Developing Large-Scale Environment-Friendly Agricultural Districts and Follow-up Plans

The Project for Developing Large-Scale Environment-Friendly Agricultural Districts (PDLEAD) is a core project to establish and promote an environment-friendly agriculture as a growth engine of future agriculture. This project, which aims to invest KRW 10 billion (50% central government funding, 40% local government funding, 10% self-funding) to each district for 2 years, was launched in 2006 for primarily 3 regions of Wanju, Suncheon and Uljin (Phase 1). The first phase of the project has already been completed and the project has been in Phase 2 since 2007 in the six regions of Yanggu, Okcheon, Iksan, Jangheung, Seongju and Sancheong.

According to a self-evaluation of the project that has been implemented between 2006 and 2008, it is suggested that the progress and performance of the project is not satisfactory. In this context, this study aims to identify problems of PDLEAD by analyzing the actual conditions of large-scale environment-friendly agricultural districts and propose plans for improving and efficiently implementing the project.

In this study report, Chapter 1 deals with the necessity of this study and literature review; Chapter 2 describes the actual conditions for implementing the large-scale environment-friendly agricultural districts; Chapter 3 presents the examined results of the actual conditions of the large agricultural districts; Chapter 4 evaluates the performance of the large-area agricultural districts; Chapter 5 proposes follow-up plans; and Chapter 6 summarizes and concludes this study.

It was found that there has been a discrepancy between the original plan for receiving the fund for PDLEAD and the actual implementation plan after being selected as a recipient of the

project, and the nutrient balance of agricultural resources of each district was not properly considered. It appeared that in most large-scale agricultural districts, residents of nearby areas claimed that the Resourcefied Center of Crop-Animal Farming (ReCaf) is an obnoxious facility and opposed it, thus resulting in the delay of its construction.

The highlights of the study are summarized as follows:

First, the PDLEAD is a top-down government-initiated project to establish the infrastructure for environment-friendly agriculture. So, it was shown that both the farmers and the people in charge of the policy agreed on the necessity of the project. However, it was revealed that, by the low degree of participation of the concerned farmers in the project, it would be difficult to achieve the objective of authenticating the environment-friendly agricultural products.

Second, most of the 9 regions for which the PDLEAD has been implemented have poorly achieved their objectives drawn from evaluating the results in comparison to the objective of the project. The Iksan district, in particular, has achieved the least, requiring special actions to be taken.

Third, it appeared that during the PDLEAD period all efforts were focused on purchasing and installing related equipment and, therefore, effective operation and follow-up plans were not established properly. In addition, even though the ReCaf has to be established as a business that could produce revenue for the district, it does not appear to be realistic to secure operating expenses for the ReCaf office when the project ends.

Fourth, in order to operate the ReCaf facility smoothly, an organization with a sound capital structure and enough operation experience has to be selected as an operating body. The follow-up management for the ReCaf facility consists of facility, quality and profitability managements, of which the profitability management appears to be most important.

Fifth, for the large-scale agricultural districts to make profits to continue its operation, marketing strategies should be

provided to find markets for their environment-friendly agricultural produce and sell the composts from livestock manure produced at the ReCaf facility at reasonable prices. In order to ensure the success of the PDLEAD, it is necessary to select an organization that will take charge of the efficient operation of each facility and its follow-up management and establish a large-scale environment-friendly agricultural district operation support group that will support the organization's operation indirectly and implement related projects.

Sixth, in order to develop a large-area agricultural district established in each area into a foundation for green growth in the future agricultural sector, it is necessary to positively establish plans to develop the district in connection with the biomass town and low-carbon agricultural production systems.

Lastly, to make the most of the large-area agricultural districts established in each area and develop an organic relationship with the above mentioned town and system, it is needed to examine a plan to organize and implement the tentative named "Large-Scale Environment-Friendly District Association (tentative name)." The association will be able to contribute to establishing stable markets for environment-friendly agricultural produce from the district by concluding a memorandum of understanding (MOU) between the district and large distribution companies. The association will also be able to utilize the subsidy for environment-friendly agricultural produce for expanding the nationwide joint marketing for environment-friendly agricultural products by connecting "production-processing-distribution" and promote their consumption.

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## 2.1 A Study on Distribution System of Imported Fruits and Vegetables in Korea

This study has a purpose of understanding the local distribution system of imported vegetables and fruits whose volume is increasing these days. It deals with the features and causes of the increase in vegetable and fruit import, features and associated problems of imported vegetable and fruit distribution, and issues to be addressed to resolve such problems. A total of 36 importers and 47 intermediary wholesalers were interviewed for this study.

The analytical results of the features of vegetable and fruit import and distribution are as follows:

1) Fruits are mostly imported as fresh fruits. Fruits whose unit price is high or which have a higher quality tend to be imported more frequently. In the case of vegetables, frozen or half-processed (1st processing) spicy vegetables and kimchi are imported from China in a significantly increasing volume.

2) Importers play an important role in the importation and local distribution of vegetables and fruits. Fruit importers are smaller in terms of number than vegetable importers. But in terms of import volume, fruit importers are 3~5 times larger than vegetable importers. The volume imported by fruit and vegetable importers shows the growing trend on average. However, most of them are small-sized except for a few. Likewise, importers are polarized by scale.

3) Imported fruits are consumed at most homes in the form of fresh fruit; accordingly, they are distributed mainly through importers, wholesalers and retailers in that order. In the meantime, imported vegetables are used as food materials at restaurants and other food service facilities for providing meals or for processing purpose by food processing companies. Therefore,

the distribution routes of imported vegetables include wholesale markets, traditional open markets, processing factories, food suppliers and facilities for providing meals. 30% to 40% of imported fruits and vegetables are distributed through wholesale markets. The profit margin from imported vegetables and fruits is higher on the release stage than on the wholesale stage in general.

4) Intermediary wholesalers of imported fruits trade a variety of imported fruits only for profit gaining purpose, while the intermediary wholesalers of imported vegetables handle one or two items of local produce in addition to imported vegetables which are not locally produced at a certain time. Intermediary wholesalers prefer imported vegetables and fruits because of low and stable price, clear specifications, processing and follow-up measures (after problem occurs).

5) Large-scale distributors import fruits from importers as much as 40% or above and recently they are presumed to import some 20% through their own importing division or an affiliate. Quasi-wholesale and traditional open markets are estimated to account for 26% to 30% of the distribution of imported vegetables and fruits. Since traditional open markets have small processing facilities such as mill, processing of frozen hot peppers takes place there.

The problems faced when distributing imported vegetables and fruits include small and unstable importation structure, excessive competition within the market, inefficient quarantine and inspection, weak wholesale market structure and illegal distribution.

1) According to the customs clearance data of the Korea Customs Service, the business lifespan of importers is 2 years or below on average and the importers which have been in business for 5 consecutive years or above account for 4.7% only. The volume of imported vegetables and fruit handed over by importers and intermediary wholesalers is small and they are in fierce competition. The measuring of intensity factors such as CR4 and

HUI shows that competition is most fierce in vegetables including frozen hot pepper, frozen garlic, carrot, onion and the green onion family vegetables.

2) Many issues were raised regarding inefficiency and long time taken in the quarantine and inspection process of imported vegetables and fruits, which results in lowering product values. Inefficiency is also found in the distribution of imported vegetables and fruits at wholesale markets. It was criticized that a wholesale corporation performs the settlement function only; some intermediary wholesalers conduct illegal trading outside the exchange; and fees such as unloading fees are added at wholesale markets. As spicy vegetables are mainly used by restaurants and facilities for providing meals, they are imported in the frozen form with lower tariffs and distributed in Korea after reprocessing processes such as drying and grinding. When it comes to spicy vegetables, many cases of illegal distribution are found related to the labeling of product origin.

3) Spicy vegetables including hot pepper, garlic and onion are tariff rate quota items, and as a result, their importation is managed by the government. For the three items, the government accounts for 15-30% of the total import volume. They are sold in the form of public auction, listing and direct distribution (direct distribution and allocation). The agricultural products imported through the government trading do not meet the quality expectation of general consumers. Therefore, they are purchased mainly by restaurants and processing factories. Since the tariff on quasi and alternative processed foods is very low, the import volume of spicy vegetables is increasing dramatically. This indicates that there is a limit in protecting producers through TRQ management.

4) The problems related to the clearance, quarantine, and inspection are as follows: The reporting of low prices, illegal smuggling and other cases of illegal distribution are found. The document-based inspection is less trustworthy. The departments in charge are multiple and they don't share information much. The



importer management system is not existent. The registration-based importing system can accelerate the pop-up of small-scale importers. The lack of professional staff and high-tech gears for inspection and quarantine and the low-tech standards put a block to the thorough inspection and quarantine process.

5) The country-of-origin labeling has several issues as follows: The false labeling of country of origin is differently punished by diverse laws and controlled by two organizations. When it comes to traditional markets and small-scale stores such as street vendors, malpractice related to country-of-origin labeling is difficult to be regulated. The reporting of false country of origin is still insufficient.

To improve the distribution of imported vegetables and fruits, the following issues should be addressed:

1) To improve the customs clearance process, it is necessary to improve the statistics model that detects reporting of low prices and collect basic information. The monitoring system should be strengthened to prevent illegal smuggling.

2) To enhance the inspection and quarantine process, paper examination should take place less and in-depth examination and random sampling for examination should take place more. It is necessary to designate one organization solely responsible for inspection and quarantine and align the local laws and regulations with the international standards to improve the negative system or introduce a positive system as in advanced countries.

3) As a method of import management, the specifications for imported vegetables and fruits should be prepared in more detail, and the market-oriented TRQ method including the public auction of importation rights should be expanded gradually.

4) The roles of importers are critical in distributing imported vegetables and fruits. The database on importers should be established and the system of evaluating and disclosing credit ratings of importers should be sought. Wholesale market is a distributional organization that plays a key role in distributing

imported vegetables and fruits. Trading imported vegetables and fruits at stable prices is essential and the method of reducing subsidiary expenses should be pursued. To this end, it is necessary to seek the electronic trading of fixed prices and private sales.

5) The inconsistent penalties by different organizations for falsely labeling the country of origin should be made uniform or the organization in charge should be designated as one. The guidance and management of the country-of-origin labeling should be continuously provided for non-regulated markets or small companies. Processing companies should be mandated to manage the records on imported vegetables and fruits. The obligation of country-of-origin labeling at restaurants should be expanded on a gradual basis.

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## 2.2 Analysis of High Potential Agricultural Export Market and Korea's Proper Responses - Centered around Russia

Agricultural exports should be pursued actively in the era of market opening in order to improve the local agribusiness quality and strengthen its competitiveness. The purpose of this study is to understand the export status of Korean agricultural products to the Russian Far East and detect challenges and measures for improvement to increase agricultural export to the recently emerging export market with a high potential for Korean agricultural products.

Korean strawberry, bell peppers, and tomato are purchased at department stores or large hypermarkets by top 10% income earners in the Russian Far East. To the contrary, such products as Korean tangerine and rose have medium quality and are consumed by the general public at lower prices. The Russian awareness of Korean agricultural products is mostly weak but their preference is high.

A survey was conducted on exporters of Korean agricultural products to Russia. The survey showed that the main troubles are the instability in securing product volume depending on local prices of fruits and the difficulty in securing refrigerator containers. For fruit vegetables, it was found that marketing activity is insufficient; promotion and sales require high cost; and it is difficult to maintain fresh condition and marketability of the produce. For horticultural products, the difficulty in securing export volume, insufficient screening and distribution facilities and the lack of facilities to produce high-quality horticultural products are found as obstacles to export.

The profits and losses are volatile since the export to the Russian Far East is in its infancy. However, we have learned from previous successes and failures that prior understanding of

export feasibility, phased-in expansion of export volume, decision of export volume in consideration of market consumption size, and the export of high-quality agricultural products are essential. In addition, considering the climate and natural features of the importing country, the areas for further effort include expanding the possibility of developing potential markets, development of various technologies to maintain fresh quality and marketability, maintenance of constant trust with local wholesalers and large retailers, continuous promotional endeavor to increase awareness of Korean agricultural products and sales activities, and constant improvement of institutions putting an obstacle to export.

In order to expand the export of agricultural products to the Russian Far East, we first of all need to direct efforts to enhancing the competitiveness in quality and improving price competitiveness as a supplementary move. Competitiveness in terms of quality and price could be enhanced by improving production facilities, developing new technologies and improving logistical system, and the efforts to achieve this should be made continuously. Secondly, the export volume should be secured in a stable manner, and it can be achieved by systematically running a large export organization and unifying contact points. From this perspective, the government's initiative entitled "Project for Fostering Agrifood Export Leadership Organization" is a timely project. Thirdly, the screening, transportation and storage of agricultural products at low temperature should be offered at the local transportation and distribution stage. To this end, it is essential to establish or rent and manage warehouses in the Russian Far East. Fourthly, the consumers of Russian Far East have very little knowledge of the Korean agricultural products. To overcome this, more active promotional and marketing activities are required. Fifthly, it is necessary to shorten the time taken for customs clearance as it acts as a non-tariff obstacle to market advance. The issue of the long time taken for customs clearance doesn't affect Korea only. However, the government-level effort could simplify the clearance procedures. Sixthly, a corporate entity

should be established in the local market for market research, market trend reading, relation building and maintenance. When it connects importers with exporters, the initial trade at the market entry could be more stable. Lastly, institutions that pose an obstacle to export expansion need to be addressed. In relation to this, the “Fair Trade Scheme for Exported Agrifood” and the “Project for Fostering Agrifood Export Leadership Organization” are already being pursued. Nevertheless, the existing institutions for which improvement efforts are under way or which have not been detected so far should be the subject of improvement by paying continuous attention.

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### 2.3 An Empirical Analysis and Suggestion about Korean Safety Management System of Agricultural Products: Focusing on Good Agricultural Practices

Among the safety management systems of agricultural products in Korea, GAP (Good Agricultural Practices) is one of the most effective systems, which manages safety of agricultural products from farm to table. Even though the Korean government has continuously shown the endeavor to get GAP off the ground, GAP does not successfully work yet.

The main goal of this research is to analyze the current shape of GAP in Korea, and then to showcase a few suggestions to improve the GAP system.

Empirical analyses present the current problems of the Korean GAP system: low level of recognition about GAP, imperfect system of traceability, shortage of facilities for GAP products, and insufficient financial compensation to participants.

In order to solve these problems, this research makes several suggestions as the following: increase the market size of GAP products, improve the GAP system, offer a more powerful infrastructure for GAP participants, and strengthen public relations about GAP.

Basically, the Korean government needs to know that GAP is not a “certification” to guarantee the safety or quality of agricultural products, but a “system” to manage the level of safety of agricultural products from farm to table. The discussion from the research may contribute to a better food safety system in Korea.

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## 2.4 A Study on Establishing Statistics on Agro-food Loss and Waste

Agro-food loss and waste is caused by different factors in the course of production, distribution, processing and consumption of agro-good, and it affects the economy and society in various ways. In order to resolve the problems stemming from agro-food loss and waste, a detailed understanding of its status should be achieved by establishing statistics on agro-food loss and waste. In this regard, this study aims to research basic elements necessary to build statistics on agro-food loss and waste and lay down a foundation for systematic and consistent statistics.

To meet the purpose above, the study is largely divided into four sections. Chapter 2 explains the concept of agro-food loss and waste and the current status of measuring local and foreign agro-food loss and waste. Chapter 3 shows a finding by reviewing the Japanese and US data on agro-food loss and waste. Chapter 4 analyzes the causes and features of the loss and waste of key agro-foods and Chapter 5 suggests a direction for building loss and waste statistics on agro-food based on the results above.

In the study, agro-food loss and waste refers to the quantitative loss of agro-food caused by the disposal of harvested agro-food until the usability value is fully gone. In particular, loss refers to any type of quantity loss including weight reduction not accompanied by disposal. Waste refers to partial or entire disposal of agro-food to handle rotten or deteriorated produce and adjust produce volume.

In this study, eight commodities including rice, potato, Chinese cabbage, radish, onion, apple, and mandarin are selected from the staple crop, vegetable and fruit categories. To understand the current status and causes of loss and waste of agro-food, interviews and questionnaire surveys were conducted on stakeholders for each step of agro-food processing from

production to consumption

The building of statistics on agro-food loss and waste by commodity is intended in principle to build statistics for each processing step of agro-good after harvesting from production to consumption. Therefore, based on this assumption, except for the initial screening after harvesting, all processing steps including production, wholesale, retail and consumption should be covered.

The research is supposed to cover the loss and waste to identify overall food loss. However, it should be also considered that quantity reduction is not the major cause of loss, and the job of measuring loss through actual research is not easy compared with waste measuring. The items for research should include the waste ratio for edible and inedible portions of a commodity by processing step and the loss ratio by commodity.

The phase-based research on statistics from production to consumption should consider and reflect features and differences by commodity. To generalize the statistical research results, it is more desirable to select interviewees and regions from across the nation for each commodity and processing stage. As for research methods, proper methods including interviews, measurement and producer's log-based research could be used separately or side by side in view of research efficiency, effectiveness, representation capability and credibility.

Research cycle could be set by applying a same period to all processing steps or by applying different periods according to different processing steps depending on their features and research efficiency.

To select a leading research entity responsible for building agro-food loss and waste statistics, consideration should be made to things like relevance to previous statistics and researches and consistency and efficiency of statistical research. In general, if a single organization conducts a research alone, consistency can be guaranteed for the research. However, administrative and cost burden might be notable due to the breadth of research target, scope and contents. If multiple organizations are involved in the



research, it would be possible to conduct the research efficiently due to the expertise and statistical research system of each participating party. However, this also brings about the issue of amalgamating research results, requiring efficient and effective interplay of related organizations. If participating in a research is not binding on them, pursuing the research will be very difficult in reality. Due to the involvement of multiple organizations, it may be difficult to maintain the consistency of contents, and the task of amalgamating different research results will not be easy. Therefore, when one considers assigning each step of a statistical research to different agencies according to their specialty, a long-term implementation plan should be established first before bringing the research into action.

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## 2.5 A Study on Success Factors of Farmers' Marketing Organizations

The purpose of this study is to find out success factors of farmers' marketing organizations such as agricultural cooperatives and agricultural firms and to suggest development strategies for farmers' marketing organizations. There are 1,196 agricultural cooperatives and 624 marketing agricultural firms in Korea, but a large number of them are lossmakers. The Korean government has designated some high-caliber organizations as "specialized marketing organizations" and intensively support them. By 2006, 289 agricultural cooperatives and 94 agricultural firms have been designated as specialized marketing organizations, and the government annually evaluates their management performance.

To find out the success factors of a farmers' marketing organization, the government's evaluation data are used. First, we divided those data into agricultural cooperatives and firms, and conducted a cluster analysis to distinguish a successful marketing organization from each data set. A logit regression analysis was conducted afterward to see whether a certain organization is classified into a successful organization or not.

In the case of agricultural cooperative, it was found that the possibility of success tends to be higher when it deals with a specific item such as apple or mandarin, and when the share of fruits increases. In the case of agricultural firms, it was found that the possibility of success tends to grow when it has more assets and when the non-consignment purchase of agricultural products from farmers increases. An additional survey of 234 organizations and interviews with 10 successful organizations show that quality control, research and development, human resources, and local government support are also important factors for the success of a farmers' marketing organization.

As a result, we could find that success factors vary with

the type of organization. So targets, strategies, approaches, and support policies will vary depending on the type of organization. And when a marketing organization focuses on a special item, it can get competitive advantages more effectively. To cope with the price volatility of agricultural products, marketing organizations have to diversify their collection system, such as pooling practice, forward contract, and so on.

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## 2.6 A Comparative Analysis of Juveniles' Food Consumption in Korea, China and Japan

This study aims to provide a food consumption outlook by comparing and analyzing the food consumption, nutritional intake, and dietary life of juveniles in Korea, China and Japan, and present food policy directions. The adolescence is an important period because the eating habits gained in this period will continue into the adulthood.

The important results that were found from this study are as follows: First, socio-economic and demographic changes in all three countries showed increases in income and single families, as well as aging and increased participation of women in economic activity. All of these factors had an effect on food consumption. The food consumption trend showed that Korea entered a turning point of seeking improvement in the quality of food in the latter half of 1980s while Japan made a similar trend earlier in the middle of 1970s. In China too, the unit price of a calorie supply has been rising continuously.

Second, the food consumption trend of Korean juveniles showed that rice consumption fell the fastest while their consumption of bread, cookies and pork, as well as eating outs, grew fast unlike any other age group. In Japan, however, the decreasing consumption of rice has been slowing down since 2000. During this period, the consumption of pork has changed its course to an upward trend while the consumption of beef, fruits and vegetables has been falling. In the case of China, no significant changes were seen in the food consumption of juveniles in 2007 compared to 2002, and their food consumption was relatively low compared to other age groups.

Third, we compared the dietary life and food consumption patterns of juveniles in the three countries. Korean juveniles had the worst dietary life due to the increase in westernized diet

including fast food and a high proportion of juveniles skipping breakfast. The nutrition of Japanese juveniles was better than that of Korean counterparts and Chinese juveniles had more sound eating habits than the Koreans as they had meals more regularly despite less nutritious diet.

Fourth, Korea's food policy mainly deals with the lowering of harmful nutrition elements, food hygiene, and improvement of meal at school. In Japan, many educational programs on dietary life are offered by various groups; and in China, guidelines on youngsters' meals and snacks are issued, and educational programs on health and nutrition are offered.

Finally, based on our forecast of Korean juveniles' food consumption until 2020, we expect to see a decrease in the consumption of grains, beef, fish and shellfish, vegetables, and fruits but an increase in the consumption of pork, bread, cookies, drinks, and eating-out meals.

In order to enhance the food consumption of Korean juveniles, educational programs at school should be improved and become practical so as to include various learning experience programs. Also, the education on dietary life should be sought in the context of a nationwide movement. Specific policies that can improve the overall state of juveniles' nutrition need to be implemented in connection with educational dietary programs.

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## 2.7 Food Policy for the Development of Agro-food Industry and Safety

This study has the purpose of suggesting a desirable food policy direction and finding necessary tasks to be performed in the direction. To this end, policies regarding the food industry, nutrition, eating habits and food safety management were mainly reviewed. Researchers also formulated a research council and held policy workshops together with KREI, external professionals and policymakers.

The food industry is a primary industry of producing and supplying foods. It is closely related to other industries and has a big impact on agriculture and fishery in terms of production inducement. The world food industry has been expanding in a continuous manner and the growth of functional foods has been especially rapid. The Korean food industry has shown a stagnant growth mainly due to its small scale, lacking and inefficient R&D investment, insufficient infrastructure and regulation-ridden policies. The advanced countries on the contrary have fostered food industry as a strategic growth engine of national economy.

In Korea, the food industry needs to set a clear vision of becoming Asia's food industrial hub that leads the well-being oriented food consumption. Food policies should nurture a food industry capable of producing and supplying foods preferred by consumers at home and abroad; and it needs to be competitive in the global market and seek a close industrial connection with agriculture and fishery. To overcome the weaknesses arising from the small size of the local food industry, the strategy of pooling food companies and related entities into a food cluster or creating a network among them will be very effective in achieving an economy of scale and maximizing external economics effects.

Recently, an increasing number of Koreans tend to eat out and consume convenient foods. However, their westernized food

consumption pattern increases the dependence on imports for their food supply. The concern over the imbalance in nutritional intake has been growing and eating habit-related diseases such as diabetes are spreading. The objective of the government's policy on nutrition and eating habits should be made to provide the public with information necessary to form a right view on foods. It should also help them develop a habit of eating nutritionally balanced foods and actively promote the values of traditional dietary culture, thereby having the effect of contributing to the expansion of foreign demand for traditional Korean foods and improvement of national image. The Korean government needs to set the goal of establishing proper dietary habits and educating the general public about them.

The trend of eating more imported foods increases the uncertainty about food safety and has the potential to cause a large-scale food safety disaster. Against this backdrop, the interest in food safety among consumers intensifies as well. Any food safety policy should be consistently applied from food production to consumption, secure transparency in policy implementation and enhance consumer's trust. To make this possible, essential tasks need to be performed and this includes early settlement of food safety policies, preparation of a foundation to build consumer's trust, strengthening of the hazardous materials monitoring system, and effective implementation of food safety policies.

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## 2.8 A Suggestion to Foster Export-Specialized Organizations

The purpose of this paper is to suggest plans on how to systematically and effectively perform a project on fostering export-specialized organizations and management units. The project focuses on organizing and sizing up management and marketing channels in the marketing of export-aimed agricultural products from their production to export.

In order to achieve the study's goal, the range of researched items has been narrowed down to fresh agricultural products after reviewing 30 main items in the list of a mid- and long-term export strategy. The items to be covered in the Manual are kimchi, pear, citrus fruit, bell pepper, lily, citron tea, and king oyster mushroom.

According to the research findings of this study, it is desirable that the exports are led by farming unions, export corporations, and processing enterprises rather than trade firms specializing in export.

The systematization of marketing by enterprises is still unsatisfactory. But, when an export-specialized logistics system like the Israeli Agrexco is built up in the future, a cooperative system can be maintained among farmers, committees on each item, and export-specialized organizations.

This project is scheduled to support 30 items and 48 enterprises during a five-year period from 2008 to 2012: 6 items in 2008, 4 items in 2009, and 18 items from 2010 to 2012.

As for the target items and organizations of a guide project selected in 2008, it is desirable to select and intensively support items and enterprises with higher expectation effects in promoting the project.

As for project support considerations, it is desirable to give indirect support that would help raise the mind of participating



members to actively take part in the exporting endeavor and promote self-reliance ahead of others rather than directly support project tasks such as the improvement of production foundation and structure.

The process of fostering export-specialized organizations is divided into preparation stage and execution stage. From the establishment of a project plan to the training of farm households is the preparation stage and the concrete execution stage includes 1) selection of farms and contract signing 2) management of farming and harvesting 3) quantifying the collection and securing 4) selection, packing, and storing 5) sampling and settlement of accounts 6) marketing 7) annual settlement of accounts and evaluation.

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## 2.9 A Study on Establishing a Cyber Trading Center for Agricultural and Fishery Products

This study has the purpose of analyzing the need and roles of a cyber trading center for agricultural and fishery products, drawing up measures to establish and operate the center, and developing a plan to build an information system of the center.

The study is largely divided into four sections. First of all, based on an analysis of the agricultural and fishery product distribution status, it highlights the need to build a cyber trading center for trading agricultural and fishery products and explains the roles and functions of the center. Secondly, it reviews the major business areas (types) of the cyber center, primary trading items and trading parties, operating entity, the initial plan to launch the center, the plan to control logistics and product quality, dispute resolution measures, price payment and clearing measures and legal and institutional stimulants for the center's operation. Thirdly, it develops a plan to build an Internet-based information system for the cyber trading center. Lastly, the economic effect and feasibility of building and operating a cyber trading center is analyzed.

The key findings of the study are summarized as below:

1) Currently, the cyber trading of agricultural and fishery products is conducted centering around the Business to Consumer (B2C), and Business to Business (B2B) trading is very rare. 2) The trading volume is getting larger along with the growing size and stratification of agricultural production, shipping organizations and the restaurants which are growing their size and building a chain. In addition, the conditions for B2B trading are getting mature with the payment and guarantee systems prevailing and the logistical standardization in progress. 3) The government should take the initiative in establishing the cyber trading center to build the infrastructure for agricultural B2B trading which is

difficult to be pursued by the private sector and operate the trading system to encourage the private sector's participation in it. It needs to build a differentiated information system for environment-friendly and premium agricultural/fishery products to which securing a marketing channel and building consumer trust is necessary to facilitate B2C transactions. 4) The cyber trading center could be established in the form of a special corporation or a subordinate (spin-off) organization under the management of a specialized distributor agricultural and fishery products. It seems desirable to run the cyber center as a subordinate arm of an agricultural/fishery distribution organization for the time being due to the benefit of easy establishment and securing trust, and later convert it into a special corporation when related laws are enacted. 5) Before having self-sustaining participants in the B2B transactions, the existing transactions of certain volume should be transferred to the cyber trading center for B2B transactions. The B2B transactions don't restrict the types of items for trading in principle, but in the pilot stage, more standardized items should be primarily introduced for trading. 6) To address the difficulty of seeking a credit guarantee to facilitate B2B transactions, it is necessary to establish a 'clearing house' for small and mid-sized agricultural and fishery product purchasers. 7) If a cyber trading center is up and running, several positive economic effects would occur. Sellers could minimize the financial impact coming from non-performing loans by applying a safe payment method. They can also expand sales routes and increase managerial efficiency. Purchasers can have the opportunity to expand their business (size growth) or improve managerial efficiency through the enlarged supply of funds. The cyber trading center could enhance trading transparency by supplying sufficient information and dramatically increase distribution efficiency by improving the trading structure over the mid to long term.

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## 2.10 A Study for the Efficient Management of Food Safety Inspection Programs on Agricultural Products

In Korea, the National Agricultural Products Quality Management Service (NAQS) has been carrying out food safety inspection programs on agricultural products since 1996, and the numbers of items and samples inspected by NAQS in 2007 were 150 items and 68 thousand samples. Even though NAQS keeps endeavoring to increase the level of food safety of agricultural products, the current inspection system still has several problems including the following: unclear standards to decide the number of samples and farmers' resistance to sampling in the field.

The main goal of this research is to analyze the inspection programs of NAQS and suggest a more efficient food safety inspection system for agricultural products. Surveys and interviews were conducted to analyze the current status of the inspection programs of NAQS, and case studies were carried out to examine food safety inspection systems of the U.S, Australia, EU, Japan, and Taiwan. The research also developed a method of deriving at minimal numbers of samples for inspection, which is statistically reliable.

The research showcases the basic strategies for efficiently managing the food safety inspection programs of NAQS and they are as follows: first, strengthen inspection before selling products; second, integrate the management system for food inspection; third, establish the inspection system at the national level; fourth, improve the methods of inspection; fifth, clearly share the roles of central and local governments.

Basically, the discussions and suggestions made in this paper will offer the guidelines to increase the efficiency of food safety inspection of NAQS.

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## 2.11 Estimating the Value-Added of the Korean Agribusiness Sector

The Korean agribusiness sector is a source of jobs and earnings for millions of Korean workers. The Korean agribusiness sector involves a wide range of businesses from farm product supply to fast food chains. The activities of farmers, processors, manufacturers, wholesalers, retailers, as well as restaurateurs and transporters, should be coordinated to satisfy the changing demands of consumers, businesses and government. Estimating the value added and employment status of the Korean agribusiness sector is conducted using the Korean input-output table, which describes input use and payments for each sector of the national economy.

The Korean agribusiness sector's share of the gross domestic product (GDP) was 10.4 percent in 2006. The actual levels of employment and GDP have increased in almost every year since 1995, though the proportion has mostly dropped. In 1995, the Korean agribusiness sector accounted for 16.8 percent of GDP. The growing output (in won) and employment (in jobs) reflect the move of both domestic and foreign consumers away from low-value bulk commodities toward more high-value processed products.

The Korean agribusiness sector has added 78 trillion won on to the Korean GDP in 2006. Out of this, 53 trillion won came from manufacturing and distribution, while 17 trillion won came from inputs. In 2006, the farm sector alone was worth 25 trillion won.

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## 2.12 A Study on Reorganization of Food-Related Law Structure

Food-related domestic laws are administered by several government departments. This results in the lack of specialty, unity, and responsibility which could be accomplished by a single government department in implementing food-related laws. The purpose of this study is to find ways to improve the food law structure and efficiently administer the laws by examining the food law structures of several foreign countries and by carrying out consumer and food company surveys.

There are four main problems in the domestic food law structure. First, various government departments have their own food-related laws and are in charge of many services, causing unnecessary cost and resource spending through redundancy and distribution of regulation. Second, various food operating systems make food agencies inefficient and delay the process of coping with food safety-related incidents. Third, the food labeling-related law is separately operated in commodity units and the scope of target commodity is not clearly defined, thus making unclear the locus of responsible agency in times of food accidents. Lastly, the regulation of food-related laws by each department is an obstacle to constructing mutual sharing among different agencies.

The domestic food-related law structure is evaluated in five aspects. First, there is no fundamental food law covering all foods, and it is scattered among different authorities. Second, since the objectives of most food-related laws are associated with hygiene, safety, and industry promotion, their roles are not clearly defined and related contents tend to overlap. Third, the food laws related to safety management are independently administered by several departments. Fourth, the laws related to food labeling are included in individual laws in commodity units, and those are not regulated by the upper law. Fifth, the scope of the food industry



is ambiguously defined and acts as a hindrance to the promotion of the food industry.

Concerning the main problem of the domestic food law structure, food manufacturers, processors, and service providers indicate that there are too many related laws, whereas traditional food industries, agricultural management groups, and consumer groups point out that food-related laws and governing departments are dispersed. Food industries and consumer groups all agree with the unification of food-related laws.

A medium- and long-term plan for the food-related law structure is to enact a comprehensive food law that includes both the existing food safety law and the law on agriculture, rural communities and food industry. This plan is expected to solve many problems the dispersed food laws otherwise could not have managed. However, this plan requires an extensive adjustment of the food law structure and there is an opposition from the existing institutions. As an alternative, a short-term plan can be devised and it is to extract common factors applicable to the food quality labeling of agricultural, marine, and livestock products and enact a unified law about food qualities. This plan provides the benefit of maintaining a balance among related institutions through role assignment and mutual control, whereas legal overlapping and contradiction may occur due to shared responsibility.

For the rational improvement of the food law, revisions should be regularly made to minimize unnecessary cost and allow consumers and food companies cope with a new environment. In addition, publication of law handbooks or other forms of PR materials need to be considered for better understanding and utilization of the legal structure.

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## 2.13 2007 Food Balance Sheet

The 2007 Food Balance Sheet provides information on the food supply and demand situation in Korea. The main concepts of this study are food supply, nutrient supply, and international statistics. The per capita per day net supply was calculated for food supply and the supply of energy, protein, and fat was calculated for nutrient supply. Also, self sufficiency rate of energy was included as an indicator of food self-sufficiency. The FAO international statistics data was used and processed to make a comparison of food supply worldwide. The Food Composition Table, which was published in 2006, was used for the calculation of food balance sheet for 2006 and 2007 (preliminary).

While the net supply of cereals and vegetables decreased from the previous year due to bad weather and a decrease in cultivation area, the net supply of fruits increased due to an increase in cultivation area. There were major increases of supply in meat and seaweed but a major decrease in the supply of starchy roots. While the food supply per capita per day of cereals, pulses, sweeteners, vegetables, and fish and shellfish decreased compared with the previous year, the food supply of pulses, fruits, meat, oil and fat increased. The total energy supply in 2007 was 2,967Kcal per capita per day. It decreased by 19Kcal from the previous year.

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### 3.1 Current Situation of Multi-Cultural Rural Families and Policy Tasks

The main purposes of this study are as follows: 1) to investigate the current situation of multi-cultural rural families in regard to farming and other economic activities including social welfare services; 2) to identify the current condition and problems of related policies; 3) to suggest policy tasks from a multi-cultural perspective.

The major research methods were field survey, in-depth interview, collection and analysis of existing data, and so on. A field survey was conducted on 400 multi-cultural rural families. Existing related data were collected by searching the data of related research institutes and governmental organizations. The in-depth interview was conducted on 20 multi-cultural rural families. Descriptive statistics such as frequency, percentage, and mean were used to organize and summarize the data.

According to the field survey, 43.2% of female respondents answered that they were not (or rarely) participating in farming. Only a small percentage (7.5%) of female respondents answered that they participated in non-farm economic activities.

Seventy nine point one percent of multi-cultural rural families had a farmland of 2ha or less. Fifty three point six percent of multi-cultural rural families had an annual household income of 20 million won or less.

Major policy tasks from a multi-cultural perspective are as follows: 1) improvement of multi-cultural family related laws; 2) construction of a cyber support system, 3) provision of precise information and pre-education, 4) improvement of service delivery system, 5) reinforcement of Korean and mother-tongue education, 6) improvement of agricultural education, 7) construction of agricultural foundation and support for agricultural succession generation, 8) support for agribusiness and non-farming activities,

9) improvement of social welfare system and expansion of social welfare services.

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### 3.2 Improvement for Rural Health Care Service Delivery System

The supply principle of health care service in Korea is based on “laissez - faire” and the share of private sector in health care facilities is around 90%. And most of them are located in urban areas, but they are scarce in rural areas. It is difficult to expect that they will be located more in rural areas in the near future.

The government has been trying to improve the circumstances of rural health care system so as to give rural residents, including farmers, better health care services. The main projects are establishment of Health Centers since the early 1960s, introduction of Public Health Doctors since the early 1980s and execution of the Rural Health Care Service Improvement Project since the mid-1990s. These policies have resulted in no rural areas without a doctor and rural residents can visit health care facilities, especially Public Health Centers, Sub-Public Health Centers and Primary Health Care Posts, easily than ever before.

In short, the hardware systems for rural health care service are sound whereas the software systems are not.

The circumstances for rural health care service are rapidly changing. Economic development, the development of medicine, transportation and information, heightened awareness of healthy life by rural residents, and chronic diseases are the main trends of future changes. Furthermore, the resources for Public Health Doctors are expected to decrease significantly in the near future.

Taking these circumstantial changes into consideration, this study suggests the introduction of the Attending Physician System in rural areas for fundamentally improving the rural health care system.

Since the differences among rural areas are very large in terms of population, ratio of elderly population, transportation,

economic resources, and so on, consideration should be made to the characteristics of each region in designing the Regional Health Care Plan every 4 years.

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### 3.3 Rural Policy Reorientation Scheme for Making Livable Rural Areas

The aim of this study is to draw a number of policy tasks for rural development from an analysis of rural conditions and a projection of rural future and suggest a number of ways to redirect and reorient rural development policies to make rural villages a good place to live. Rural development policy programs and projects can be rearranged and reoriented in three areas, that is, policy objectives, contents and implementation.

Policy objectives must be redefined. While rural development policies can still be aimed at making rural villages a good place to live, concrete valuation and allocation criteria must be drawn up in detail for rural villages to be places for living, work, rest, and community so that limited policy resources can be utilized efficiently and effectively.

In addition, policy contents must be thought out carefully. First, in order for rural villages to become a good place to live, policies must be targeted at establishing a service network built upon a settlement hierarchy of “household-village-central place-neighboring city” rather than at improving physical infrastructure. Secondly, in order for rural villages to become a good place to work, local specialty products and intangible resources must be cultivated so as to constitute a local industrial cluster, and at the same time, local service needs and demand must be translated into community business opportunities so as to generate extra employment and income. Third, in order for rural villages to become a good place to rest, rural amenity resources must be carefully documented, cultivated and developed into marketable products. Finally, in order for rural villages to become a good place for community, education and learning programs for local agents must be improved, and also rural in-migration must be encouraged.



However, policy objectives and contents must be adapted to diverse local conditions. Classification of rural areas into four different types reveals this possibility of various adaptation of policy objectives and contents.

In rearranging and reorienting rural development policies, changes in policy implementation are decisively important. First, perspectives and interests of local governments should take precedence over those of the central government in policy implementation. Secondly, some small-scale rural policy programs and projects must be abolished and others must be merged and, together with this abolishment and merger, a package of blanket financial assistance must be extended, and policy guidelines must be furnished to local governments. Only this will prevent local governments from blindly scrambling for budget allocation and from recklessly pursuing central government directives without paying too much attention to policy outcomes. Third, a system of incentives and penalties, in conjunction with a measure for the evaluation of policy outputs and outcomes, must be in place. Finally, all relevant legal codes and regulations must be reviewed and, if necessary, re-written. Specifically, ‘Special Act on Improvement in Quality of Life,’ together with ‘Agriculture, Rural Areas and Food Industry Act’ and ‘Rural and Fishing Village Improvement Act,’ must be overhauled.

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### 3.4 How to Lower Entry Barriers to Farming

The purpose of this study was to develop strategies to lower entry barriers to farming. For the purpose, this study reviewed literatures, reassessed related systems, analyzed related statistics, surveyed new farmers, and performed case studies.

Literature review identified four entry barriers to farming: economic capital, professional competency, market network and social network. A reassessment of related systems found that the new farmer supporting system has relatively weak areas such as market and social network; the central government's new farmer foster program has a structural barrier to most of new farmers; some recently launched programs for new farmers have limited effects with no standard patterns to follow; and agricultural literacy programs to induce people into agriculture are needed. The analysis of related statistics revealed that the natural population decrease from old farmers' retirement accounts for the recent reduction of agricultural human resources; new farmers show the characteristics of limited resources, limited participation in agricultural organizations, and no agricultural education background. The survey and interview of new farmers indicated that the four entry barriers of this study are valid; new farmers who are planning to enter farming face different barriers from each other; new farmers who have prepared for a longer time and participate more actively in agricultural organizations are inclined to have lower barriers; and social network is a key entry barrier which should be solved before the other barriers.

These research results led to develop a basic direction of strategies to lower entry barriers to farming: to assist new farmers accumulate social capital by participating in agricultural organizations, and phase in farming with sufficient preparation.

Under this direction, this study drew eleven specific measures from case studies of non-agricultural sector and foreign countries: 1) farming apprenticeship for agricultural students; 2) employment of agricultural corporation or big farm; 3) central and local networks for new farmers; 4) individual development for the build-up of new farmers' economic capital; 5) comprehensive manual for new farming; 6) competency based and packaged funding with education and following actions; 7) farming education for secondary and tertiary agricultural students; 8) education and incentives for agricultural production organizations; 9) more precise data collecting system on new farmers; 10) agricultural literacy education for the people; 11) central and local administrative supporting system to accelerate those measures for new farming.

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### 3.5 A Study on Policy Directions and Measures for Rural Central Places in Consideration of Transformation in the Spatial Structure of Country

Today's rural areas, especially the rural centers, are facing difficulties in terms of changing spatial structure, and therefore they are in need of special policies for revitalization. The purpose of this study is to suggest policy plans for regenerating the rural centers based on an examination of the actual conditions of rural centers and their hinterland. For this purpose, various analyses on the change of spatial structure of land and rural areas are performed. Surveys and field research for understanding the present rural situation are performed as well.

In Chapter 2, we confirm the perspective and direction of this research with implications drawn from existing studies.

In Chapter 3, the present conditions of spatial structure of land and rural areas are analyzed. To make a diagnosis about the changing trends of spatial structure, we look into the spatial structure with the use of data on population mobilities, business · study trips, economic activities, etc. And as a preceding work for case studies, rural areas are classified into 4 categories according to the nature of rural centers.

In Chapter 4, the given conditions of rural centers are examined carefully. We selected 4 municipal areas (shi or gun) for a close case study and performed investigation and surveys to find out the conditions of service provision. Interviews and surveys questioned rural residents about conditions of availability and accessibility to various essential services and asked their opinions about the desirable direction of future policy.

In Chapter 5, we addressed the present policies and current trials for regenerating the rural centers and drew certain problems and issues which should be discussed for improvement. We also reviewed foreign policy conditions relevant to the revitalization of

rural centers, such as those of Japan, France and England.

In Chapter 5, policy directions are determined and some regeneration plans for rural centers are proposed through the synthesis of case studies, survey results, and implications from related policies at home and abroad. The policy directions are drawn in consideration of 4 rural categories and 4 case study areas.

The suggested plans are as follows:

Firstly, the central government should supply a guiding principle to local governments to make regeneration plans. Secondly, the central government should develop a set of connected programs with governmental support. Thirdly, it is essential to establish a minimum service standard with respect to living conditions in rural areas.

For the policy directions of local governments and local civic groups, a comprehensive local plan including development schemes for rural centers is necessary. Secondly, an effective framework for pursuing various development programs should be constructed. Thirdly, it is necessary to closely connect rural center regenerating programs with other development programs with different purposes. Fourthly, it is important to utilize existing facilities to provide basic services in rural areas. Fifthly, the idea of introducing rural leisure programs in connection with central facilities of the area can be considered. Sixthly, programs for social employment can be developed in link with the management of central facilities. Seventhly, rural centers can be developed further so that the center can be a strongpoint for urban-rural exchange. Eighthly, alternative transportation methods at the community level are strongly encouraged in terms of service accessibility.

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### 3.6 Database Development Plan for Korea Rural Statistics

This study has evolved from identifying the rural statistics we have now and that we should have to collect in the future for the purpose of regional and rural research and policy analysis. A set of recommendations for the database requiring additional rural statistical information has been compiled. These recommendations cover population and houses, regional economy, regional finance, regional agriculture, health and social welfare, education and culture, environment, land, social overhead capital, and regional community.

While it is anticipated that the development of rural statistics will have long lead times, the availability of data on small areas and information on rural Korea will generally improve considerably as a result of database development plans. Regional impacts and outcomes cannot be understood without the access to better information and empirical evidence. In particular, there is the need for data to help explain and understand the changes of population and houses, regional economy and finance, agriculture, health and social welfare, education and culture, environment, land, social overhead capital, and regional communities in rural Korea.

This research is broadly structured so that the chapters follow sequential stages of arriving at an agreed set of rural database development priorities. Chapter 2 presents a discussion on the complexities of Korean geography and definitions of rural Korea, regional statistics and rural statistics, and indicators related with rural statistics.

Chapter 3 presents an overview of the rural statistics in Korea and discusses the problems of regional and rural statistics. Chapter 4 introduces comparisons between Korea and England, USA, Australia, European Union, and Japan based on the rural

statistics. Chapter 5 introduces the needs for rural statistics for the purpose of regional research and policy analysis. The data needs that were identified through consultations with users and surveys are categorized broadly concerning the issues of population and houses, regional economy and finance, regional agriculture, health and social welfare, education and culture, environment, land, social overhead capital, and regional community. These categories are interdependent, and a combination of all data types may be required to highlight specific issues.

Chapter 6 deals with a database model for rural statistics and a set of recommendations for rural statistics development to be undertaken by the KREI (Korea Rural Economic Institute), together with those data needs that are proposed for further development in collaboration with other agencies. As it is beyond the capacity of the KREI to provide all the data required in this multi-disciplinary field, across-agency agreements will be sought with other major data producers to collaboratively develop and make available new data sources for regional and rural analysis.

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### 3.7 Agricultural and Rural Policy Direction for Hwacheon with a Survey of Rural Amenity Resources and Farm Household Economics

The purpose of this research is to derive long-term policy directions for agricultural rural development in Hwacheon with a survey of rural amenities and farm household economies. The major results will be divided into two parts. One is to utilize and connect each marketable resource with the categorization and characterization of regional amenities and the other is to categorize farm households with respect to the situation of farm management and economics and propose differentiated policy programs to each categorized farm household.

The representative rural amenities in Hwacheon could be characterized as regional festivals that many urban visitors want to participate, externally well-known resources, and rural tourism villages established through rural-urban exchanges. The amenities include "Sancheoneo Festival," "Tomato Festival," "Wha-ak Mountain," "Kwang-duk Valley," "Kok-un-Koo-gork," "Togomi Village," "Peace Dam," "Boong-eo Island," and "Paro Reservoir."

There were not so much differences in the characteristics of amenities by each village except Sindae-ri and Kwngduk-ri, the two representative villages for rural-urban exchange. The jazz festival at Sindae-ri has been enlarged to include nearby villages including Goowoon-ri and Jangchon-ri with improved networks between villages. The tomato festival at Kwangduk-ri has also enlarged its scope and the networks between villages.

With respect to discovering and merchandizing amenities, the characteristics of amenity resources can be summarized as follows: The concrete recognition and public understanding of diverse activities for rural-urban exchanges including small-scale festivals were not fully accomplished except a few rural tourism villages. The historical significance and differentiation of amenity



resources were neglected and not linked to specific storytelling even though individual facilities and resources were introduced. Furthermore, the villagers' recognition of historical and cultural resources was quite low and there was a big gap of recognition between the public and the residents on what amenity resources represented Hwacheon. The villages with higher-income farm households focusing on special agricultural products were not interested in developing amenity resources. The major tasks in utilizing amenities would be to discover and reinforce amenity resources and diversify the utilization policy based on village characteristics.

The human capital for farm management in Hwacheon could be summarized as follows: In comparison to the national and provincial average of Gangwon Province, younger and more educated farmers were managing farms. Therefore, the type of farming in Hwacheon was more leaned to cash crops and the ratio of full-time farming were higher than the comparable average figures of the nation and Gangwon Province.

To identify the competitiveness of farm households and categorize them for customized support, the index called farm household's potentiality was invented to identify farm households' competitiveness in terms of human capital, scale of management, social capital and the opportunity to off-farm activities. The index is calculated at the individual farm household level and grouped to regions (Eup and Myeo). According to the index, farm households in Hwacheon could be grouped to the upper level, the semi-upper level, the semi-lower level, and the lower level. The policies customized were recommended by each category.

We recommended the agricultural and rural development policy in Hwacheon in terms of amenity resources and farm household category. Not only should the customized agricultural policy be connected to amenity resources, but the development of regional amenity should also consider the type of farm household.

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### 3.8 Farmer Education & Training in Advanced Countries and Their Implications

The objectives of this study were to explore farmer education and training policies and some of the best practices in advanced countries including the Netherlands, Denmark, Australia, New Zealand, the United States, and Japan and to draw some implications on the education and training of Korean farmers. For the purpose, this study carried out literature reviews on farmer education and training policies, systems, and current status in six countries, and made visits to Japan, Australia, and New Zealand to get more specific information.

As a result of the analysis, this study could draw some implications in the following fields of interest: localization and privatization of agricultural research and development, extension of services, farmer education and training, development of many kinds of specific management skills, adaptation to climate change through farmer education and training programs, consolidation of small learning institutes, blending of programs for needs-based farmers' learning, various programs for attracting a new workforce into research and management as well as farming, development of national occupation standards and certificates on competency and quality control, systemic development, compatibility, participants' evaluation of learning institutes, and promoting the value of farmer learning.

In addition, this study made some recommendations for Korean farmer education and training policies.

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### 3.9 An Efficient Linkage between Crop Insurance and Farm Management Stabilization Programs

This study focused on examining the relation between crop insurance and farm management stabilization programs and maximizing synergy effects among them. Crop insurance was launched in Korea for only two commodities, apple and pear, in 2001. The insured commodities are 15 crops in 2008, and rice will be included from 2009. The Ministry of Food, Agriculture, Forestry and Fisheries has a plan to expand insured crops from 15 in 2008 to over 30 in 2011.

Crop insurance is one of various farm management stabilization programs to compensate the economic loss caused by agricultural production reduction due to natural disasters and relieve risks on farms. The farm management stabilization programs related to crop insurance in Korea are Assistance Program for Agricultural Disaster, Flood Insurance, Direct Payment, Farm Income Stabilization Program, and Price Risk Minimization Program.

We examined the effects of farm income protection for rice and apple farms, assuming that a farm may be supported by all farm management stabilization programs. As for apple farms, disaster assistance payments (insurance payment + assistance program for agricultural disaster) and total assistance payments were not over 95% of lost values of apples. With respect to rice farms, however, there existed cases of over 95% of lost values, indicating that there may happen more often to crops below rice income. Therefore, the government should prepare for this situation because it may cause moral hazard and budget mismanagement.

Developed countries such as USA, Japan, and Canada are using crop insurance as a safety net for farm management stabilization, and enlarging revenue insurance, considering the

relationship between various farm assistance payments and crop insurance.

We suggested that crop insurance and other related insurances should be combined into crop and fisheries insurance. Hence, the administration structure of insurance should also be restructured. The government should introduce revenue insurance and farm income stabilization program for commodities whose insurance will have been revitalized and that have a lot of data.

We also studied the linkage between crop insurance and direct payments. As for rice, we investigated the relationship between rice income direct payment (fixed+variable) and rice insurance. The results indicated that the combination of fixed rice income direct payment and crop insurance is better than that of the variable and fixed rice income direct payment and revenue insurance. With respect to orchards, revenue insurance-combined crop insurance with a contracted shipping program is better than crop insurance.

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### 3.10 How to Induce Undergraduate Students of Agricultural Colleges to Farming Area

The purpose of this study was to develop strategies to induce undergraduate students of agricultural colleges to farming areas. For the purpose, this study reviewed literatures, reassessed related systems, analyzed related statistics, surveyed undergraduate students of agricultural colleges and conducted case studies.

The literature review implicated that the students involved with more farm related experiences and events get more advanced and are more likely to have his or her job related with farm. Analysis of related statistics revealed that the number of production related majors such as agronomy, horticulture, and animal husbandry is not large while there are many agriculture related majors in agricultural colleges, and that only a small ratio of graduates take their job in the farming sector. The reassessment of related systems uncovered that there are quite a few programs to induce undergraduates of agricultural colleges to farming areas, and that the recently introduced special course for undergraduates of selected agricultural colleges to have farm related experience including farm visit, farm internship, supervised farm experience, farmer lecture, discussion with farmers, and visit to advanced foreign countries has not yet modeled standardized forms to replicate. The results of surveys on undergraduates of agricultural colleges indicated that agriculture related experience in past time and various agricultural activities in campus affect the career decision making of the students, and that the recently launched course is so effective that most students who have registered in that course are changing their perception of farming; but not a few are turning their career plan from a non-farm sector to the farming sector.

These research results (with the help of comparable cases

in foreign countries as well as in non-agricultural sectors) led to develop five short-term measures and one mid- and long-term measures to induce undergraduate students of agricultural colleges to farming areas. The short-term measures are 1) to enhance the current special course for undergraduates of agricultural colleges, 2) to build up and promote farm education resource database, 3) to assist farm related programs by departments, 4) to provide farm related student circle activities with financial aid, 5) to fortify networking among agricultural students. The mid- and long-term measure is to introduce a new education system in agricultural colleges for developing young farmers aside from the current academic education system.

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### 3.11 A Study on Actual Condition of Development Programs for Rural and Underdeveloped Regions and Settlement of an Integrated Pursuing Model

The purpose of this study is to draw subjects in rural policy to settle an integrated pursuing model of various development programs for rural and underdeveloped regions. This study largely consists of three parts, which are 1) to make an analysis of actual condition in pursuing development programs for rural and underdeveloped regions, 2) to draw implications through the examples of foreign countries that have tried to implement their own integrated pursuing models, and 3) to draw policy subjects for developing a Korean integrated program-pursuing model.

For the analysis of actual condition, we take two steps. The first step is to analyze the present condition for pursuing development programs with government documents. In this process, the inventory of programs for rural and underdeveloped regions are operationally defined as programs from “Plans for Improving the Quality of Life of People in Rural Regions” and a part of programs from the “Special Accounts for Balanced Development of Country.”

The second step is to verify six research questions inferred from the first-step analysis on the spot of projects. The research questions are demonstrated by means of focus group interviews and surveys which questioned the concerning bodies about the promoting state of the programs at the local government level and their opinions.

Finally, this study suggests eight policy subjects on the basis of policy directions derived from the two-step analysis of actual condition. The proposed policy subjects are as follows: First, establishment of definite policy goals should be preceded.



Second, it is necessary that the role of local government be rebuilt up and the existing way of one-unit-based program should be avoided. Third, spatial boundaries for the application of rural policies should be clearly defined. Fourth, establishment of Rural Area Plan which has a binding power over the region should be institutionalized. Fifth, it is required to reorganize various laws concerning rural development programs. Sixth, an evaluation system for performance management is needed. Seventh, construction of the basis of regional statistics should be proceeded in order that it can be possible to establish Rural Area Plan and to settle an evaluation system for performance management. Lastly, the most important thing is that regional bodies such as local government officials, experts and residents of the region are required to enhance their capability and positively participate in development programs.

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### 3.12 Strategies for the Promotion of Regional Industry with Medicinal Herbs

The purposes of this study are to figure out the direction for the development of medicinal herb industry and the strategies for the promotion of regional industry with medicinal herbs. The major contents of this study consist of 1) finding varieties and distribution of medicinal herbs and their demand and supply situations, 2) finding problems of the medicinal herb related institutions and regulations, 3) analyzing current situations and problems of selected medicinal herbs, 4) analyzing policy issues, and establishing a direction for the development of the medicinal herb industry, 5) developing strategies for the promotion of regional industry with medicinal herbs. The methods of study applied are literature reviews, secondary data analysis, case studies, and questionnaire surveys of farmers and producers.

The research results are as follows: First of all, the direction for the development of the medicinal herb industry was recommended as producing high-quality herbs and herb products, and differentiated marketing with low-quality imported products. For these purposes, production-marketing linkage projects at the special herb production complex are strongly recommended as a new approach.

Second, the recommended strategies for the development of medicinal herbs are as follows: 1) Construct a special herb complex for high-quality products and stable supply. Producer organization was also recommended for the enlargement of farming size, introduction of good agricultural practices (GAP) and sustainable farming methods with traceability at the zone. 2) Produce various herb goods which are preferred by consumers. Subsidize the facility and operation capital, and provide training and extension services to small farmers and encourage their entry into the business. 3) Recommend a production-marketing linkage

project based on contract for reforming the marketing structure of medicinal herbs. 4) Provide support for the research and development of region-specific medicinal herbs and solve difficulties such as high production cost and low product quality and marketing efficiency. 5) Reform the medicinal herb standardization system and the medicinal herb demand-supply control system. In addition, the administration for the production and marketing of medicinal herbs should be rearranged from the Ministry for Health, Welfare and Family Affairs (MIHWAF) to the Ministry for Food, Agriculture, Forestry and Fisheries (MIFAFF) to reduce the administrative waste of overlapping and enhance efficiency based on specialization.

Third, the establishment of a special herb complex is devised for the purpose of advancing regional development with medicinal herbs. The complex which is based on contract farming with GAP certification is designed to produce high-quality special indigenous herb products of well-known brands for selling in a differentiated marketing environment. In addition, this special herb complex project provides an integrated approach to enhance efficiency in the production, processing, and marketing process for the promotion of the medicinal herb industry.

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### 3.13 Mapping Out a Policy Direction for the Development of 'Basic Settlement Areas' Program

The aim of this study is to establish a policy direction so that a schema for the development of 'Basic Settlement Areas' can be drawn up in earnest. The proposed 'Basic Settlement Areas' program is one of the underpinning elements in the three dimensional framework of regional development policies of the current government of President Lee, namely four major axes of East Coastal Axis, South Coastal Axis, West Coastal Axis and East-West Inland Axis, "5+2" Area-Wide Economic Zones, and 162 Basic Settlement Areas. Unlike the other two, 162 Basic Settlement Areas are delineated explicitly to satisfy immediate needs of residents for basic services.

First, the theoretical meaning of 'Basic Settlement Area' is carefully studied as an extension of the previous conception of 'Human Settlement Areas,' and then, basic conditions and characteristics are analyzed, compared and classified into different types. Secondly, a number of policy directions for the 'Basic Settlement Area' program to be effective in raising the quality of life and welfare of each resident are suggested. Finally, contents of the program and measures to improve program outputs at each stage of the program are put forward.

The 162 Basic Settlement Areas, in various types of 'urban,' 'rural,' and 'urban-rural linked,' do differ from previous Human Settlement Areas in their actual conditions and characteristics. Considering the program's mandate, that is, to satisfy immediate needs of residents for basic services, and local governments' familiarity with local conditions, local governments, rather than the central government, must push forward with the program. Especially to warrant effective program outcomes, policy guidelines must be established for various groups of policies in advance so that planning and policy implementation

can follow the guidelines. In addition, a system of incentives and penalties, in conjunction with a measure for the evaluation of program outcomes, must be built into the program.

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### 3.14 Towards an Effective Local Support Program for Rural Relocation of Urban Residents: Evaluation and Monitoring

- Aim

The aim of this study is to evaluate and monitor local support programs for rural relocation of urban residents, especially their outcome and effectiveness, and to suggest an effective approach to its implementation.

- Contents

For this, first, the necessity and significance of local support programs for rural relocation of urban residents will be explicated, going over the trend of changes in rural population size. Second, demands of urban residents for rural settlement will be estimated, and also, various efforts of local governments to attract urban residents will be examined. Third, a set of evaluative criteria for the selection of model program areas will be drawn up and, in turn, distinctive features of the areas will be examined against these criteria. Fourth, evaluation and monitoring will be carried out on two levels, namely, a level of planning process and that of implementation process. Finally, upon completing this evaluation and monitoring, an effective model of local support program for rural relocation of urban residents will be suggested, encompassing a full range of important topics, such as the purpose of the program and its target, program duration and scope, principals to be in charge of the program and its implementation, program structure, and monitoring of the program implementation process and evaluation of the program outcome.

- Findings

Rural population has been declining steadily and therefore, aging rapidly. In turn, this trend has caused rural quality of life deteriorating and rural sustainability threatened. However, the current battery of rural policies and programs are targeted to maintain rural population size, which is not enough to either stop or reverse the trend. Rural policies and programs must go beyond explicitly to raise rural population. This policy turn requires local support programs for rural relocation of urban residents to carefully delineate the target group and the roles and responsibilities of the principal bodies to be in charge of the programs.

Upon surveying urban residents, 56.3% of the respondents disclosed their intention to settle in rural areas, and 4.1% among those had a concrete plan to purchase rural housing and land in order to relocate within 10 years. However, current rural policies and programs of childcare support, childbirth encouragement, marriage arrangement for rural bachelors, and so on do not capture these groups with actual intention to relocate.

After reviewing local conditions, submitted plans and expected output, and interviewing local officials, 10 rural towns and counties are selected.

Monitoring of planning process revealed a number of serious shortcomings. Most of these 10 areas could not relate existing programs and projects to the goal of attracting urban residents to relocate. Especially, unclear program structure and the limited time spent for plan making are found to contribute to this problem. However, the emergence of learning process through numerous workshops and exchange of information has been noticed. These findings imply the need for clear delineation of program structure and more aggressive education and public relation programs.

Some suggestions are as follows: first, the goal of this program must be expanded to present urban residents a possibility of new lifestyle and attract talented people with entrepreneurship to rural areas; second, localities must be required to spend at least

3 months for plan making, and program duration must be at least 3 years and should be able to be renewed twice more; third, program content must take a 'positive' approach, with a room for indispensable physical projects and construction; and finally, specific role assignments to the central and local governments, non-governmental organizations and experts must be carefully designed at each stage and contents of the program. In addition, for an on-going monitoring of the program and its effectiveness, a number of indices to be evaluated by sub-components of the program, the program as a whole, and localities are proposed.

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### 3.15 Consulting Report of Rural Development Project for Two Vietnamese Villages

This report introduces the results of a consultation to implement a rural development project in two rural villages in Vietnam. The Korea Rural Economic Institute (KREI) had performed a project to establish five-year action plans for the villages from November 2006 to April 2007, and this report is based upon the accomplishments made in the first year (2007~2008). For the period, the KREI and the National Institute for Agricultural Planning and Projection (NIAPP) of Vietnam signed a memorandum of understanding and implemented projects that had been scheduled in the action plan. Also, two institutes arranged Saemaul Undong Project Management Board organizations as promoting agencies in districts, communes, and villages. NIAPP administered an evaluation survey and reported the results as well as the final progress report. During the first-year project implementation, one of the project villages has been changed to a neighboring village and this caused a delay of the project; however, the project has proceeded as planned without big difficulties. It is hoped that the construction of a Vietnamese model of rural development will also proceed with positive consequences.

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### 3.16 Midterm Evaluation of the Five-Year('05~'09) Plan for Improving Rural Quality of Life

The main purposes of this study are as follows: 1) to identify the actual results and problems of the Five-Year ('05~'09) Plan for Improving Rural Quality of Life; 2) to suggest policy improvement measures; 3) to evaluate the rural impact of the plan; and 4) to estimate the target figure of major indicators.

The major research methods were collection and analysis of existing data, interviews, and so on. Existing related data were collected by searching the data of related research institutes and governmental organizations. Descriptive statistics such as frequencies, percentage, and the mean were used to organize and summarize the data.

From 2005 to 2007, 132 policy tasks have been propelled. The major aims of the plan were attained enough from the side of investment and evaluation indicators. Also, the plan was evaluated good enough from the side of policy formation, policy execution, and policy result.

The rural impact of the plan, on the whole, was positive. In the subjective measurement of rural quality of life, the proportion of positive evaluation increased. In the objective measurement of rural quality of life, however, the bi-polarization of rural society has deepened.

New directions of the plan are 1) sustainable rural development, 2) active rural welfare, 3) differentiation strategy by rural type, and 4) magnification of originality and efficiency.

Major policy tasks for improving rural quality of life are 1) integration of dual special laws, 2) enlargement of legal objects, 3) activation of the committee, 4) activation of secretariat bureau's function, 5) conversion of planning system, 6) introduction of rural proofing, 7) improvement of tasks transferred

at region, 8) reorganization of task territory, 9) improvement of major tasks, and 10) excavation of new policy tasks.

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### 3.17 Consulting of Rural Development Project for Two Vietnamese Villages - The Second Year Report

We have conducted consulting service for a Vietnamese rural development project since late 2006, and this report is a result of its second year activities. Two rural villages in Bac Giang and Phu Tho provinces had been selected as the project sites. In the second year, an MOU was signed again for sustained cooperative implementation of the project between KREI and NIAPP.

Visit to the site has been made for three times, mainly for the purpose of monitoring the implementation of diverse project items: new variety cultivation, micro-credit, technology training, introduction of hybrid cow, road pavement, renovation of cultural community houses, improvement of kitchen, toilet, or bathroom, and so forth.

To evaluate properly the project and to let more people understand and come to know about the project's philosophy and methodology is also an important task of the project, and the workshop held on the 2nd of December, 2008 in Hanoi, had been exactly for that. Officials from both central and local governments of Vietnam and NOG representatives participated in the workshop to share their opinions, as well as to watch six presentations. Some media covered the event.

An evaluation survey of 121 village residents including members of the Saemaul Undong project management board was implemented to ask questions about the rationality of the project's action plan, appropriateness of selected project items, efficiency or effectiveness of project implementation, etc. It turned out that project recipients were very much satisfied with the project, for instance, reporting substantially improved productivity and quality of agricultural products after the introduction of new varieties of

seeds supported by the project. For some items, however, such as road construction, the local people requested increased support because of too heavy contribution requirements.

This project proved of great help to Vietnamese central government officials in that they have applied it to their new rural village development project since 2007. The local provincial governments of Phu Tho and Bac Giang have put a considerable amount of their investment budget into the two project villages and are very cooperative. Hopefully, they will continue to exercise central roles in further village development projects. By putting the words Saemaul or Saemaul Undong on the names of the project items, the village residents fully appreciate the kind support from the Korean government.

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### 3.18 Action Plans for Promoting Foreign Agricultural Development by Regions, Commodities, and Types

Recently, the world grain prices have skyrocketed. The food self-sufficiency rate of Korea is only 26.5% in 2007 and Korea is the fifth largest importer of food in the world. Thus, Korea has experienced huge difficulties with negative effects on the food and livestock industry and consumer prices. The representative example is the agflation, a compound word for agriculture and inflation.

If the grain market structure changes from a circular structure like a business cycle to a chronic extra demand structure, strategies for securing international grains should be established. The ways of minimizing the negative effects of higher grain prices are establishment of an early warning system, expansion of the futures market for grains, and active policy support for setting up a foreign agriculture development system. The foreign agriculture development, in particular, has been considered and examined for economic and political reasons since the 1960s. The lack of feasibility studies, related experts, and a concrete vision and strategies, however, has made the existing foreign agriculture development program less effective and less successful.

Therefore, a region and crop specific program should be invented and implemented for successful development of foreign agriculture because the conditions for producing crops such as corn, wheat, and soybean are different from region to region. The objectives of this study, thus, are as follows:

- 1) To devise effective strategies of Korean agriculture's inroads into the worldwide market by region and crop,
- 2) To examine the specific implementation program of foreign agriculture development and make policy recommendations.

### 3.19 The Establishment of Long-Term Strategies and Action Programs for Foreign Agricultural Development

Recently the world grain prices have rapidly sky-rocked. The food self-sufficiency of Korea is only 26.5% in 2007. And Korea is the fifth largest food import country among food import countries in the world. Thus, Korea has experienced huge difficulties such as the negative effects on the livestock industry, the food industry, and consumer prices. The representative example is the agflation phenomenon which is a compound word of agriculture and inflation.

The direct reason of higher international grain prices is the increase of grain demand for bio-fuel which leads to the competition between the demand for food and demand for energy. Therefore, the trend of combing the food security with the energy security makes the structure of grain supply and demand more complex.

If the grain market structure changes from a circular structure like a business cycle to a chronic extra demand structure, the strategies for securing international grains should be established. The ways of minimizing the negative effects of higher grain prices are the establishment of the early warning system, the expansion of the future market for grains, and the active policy supports for setting up the foreign agriculture development system. In particular, this study focuses on the foreign agriculture development strategy and its implementation. Korea should prepare specific strategies and protocols for the foreign agriculture development.

The objectives of this study, thus, are as follows,

- 1) To devise long-term effective strategies of Korean agriculture's inroads into the worldwide market.
- 2) To examine the specific implementation program of

foreign agriculture development and make policy recommendations, including examinations of effective strategies to secure food resources from foreign countries



### 3.20 Reorganizing the Promotion Structure of Rural Industry Policy in Korea

The purpose of this study is to figure out the actual state and problems of rural industry policy in Korea and introduce a new promotion structure of the policy. The contents of the study consist of 1) defining the definition of rural industry and scope of rural industry policy, 2) finding the state and problems of rural industry policy, 3) suggesting a strategy on rural industry, and 4) developing a guideline and promotion structure of rural industry policy.

The results are that first, the definition of rural industry is a food, manufacturing, and service industry handling, treating, processing or packaging primary products, tradition and culture, and landscape in the locality.

Second, the problems of rural areas are decreasing rural population, lack of young labors, and increasing gap of income and development between urban and rural areas in Korea. On this situation, a new rural industry policy is needed. The strategies are 1) to promote local-specialized industry through select and focus, 2) to find and industrialize local assets differently, 3) to develop local resources for experience, rural tourism, and service industry, 4) to assist more firms settle down and improve conditions for investment, 5) to make local industrial network through industrial clusters, and 6) to introduce a block grant system and partnership between agriculture and other industries. On new industrial policy system, the central government focuses on consultation and evaluation. The local governments make their own rural industry development plan and develop an endogenous local specialized industry based on local assets because it is an important alternative to promote the secondary and tertiary industries in rural areas. The policy to promote it in rural areas has been considered as a powerful instrument for a long time.

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### 3.21 Systematic Organization Scheme for MIFAFF Policy Programs and Projects in the Age of Creative Area-Wide Development

The aim of this study is, first, to analyze rural conditions and current rural policies based on ongoing discussions centered around the policy of area-wide economic zones of the current regime, and secondly, to suggest a systematic organization scheme for 'basic settlement areas' development policies to promote their efficiency and synergy effects of integrated policy drives. There are 4 major substantive contents in this report:

- Theoretical examination of 'basic settlement areas,' especially their meaning and relevance;
- Analysis of urban expansion and reorganization in national settlement patterns, and of subsequent changes in rural spatial patterns and structure;
- Analysis of current MIFAFF rural policy programs and projects and their obstacles and limitations;
- Suggestions for a systematic re-organization of MIFAFF rural policies.

In order to reorganize MIFAFF's rural policies, first, some small-scale rural policy programs and projects must be abolished and others must be merged. Together with small-scale policy abolishment and merger, secondly, a package of blanket financial assistance must be extended, and policy guidelines also must be furnished, to local governments. Third, planning must be instituted at all local governments for effective policy preparation, implementation and evaluation. Fourth, a system of incentives and penalties, in conjunction with a measure for the evaluation of policy outputs and outcomes, must be in place. Finally, all relevant legal codes and regulations must be reviewed and, if

necessary, re-written.

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### 3.22 Strategies on Revising Primary and Secondary School Textbooks to Reflect Functions and Values of Agriculture, Fishery and Food Industries

The purpose of this study was to develop strategies on revising primary and secondary school textbooks to better reflect the values and functions of agriculture, fishery and food industries.

For this purpose, the study reviewed the national curriculum and the process of developing and revising primary and secondary school textbooks, including related policies and regulations. This study developed educational contents related with agriculture, fishery and food industries through literature reviews and the delphi method. The contents consisted of six thematic areas: 1) functions and values of agriculture, fishery, and food industries, 2) production of agriculture and fishery, 3) processing and distribution of agriculture and fishery, 4) values and safety of agricultural and marine products and foods, 5) agriculture, fishery and the natural environment, and 6) agricultural and marine policies.

Additionally, the proper learning levels of each content were identified based on a survey of 150 primary and secondary school teachers. This study analyzed the contents of primary and secondary school textbooks to investigate what and how the contents are covered and whether there are any errors to be corrected. In order to develop effective strategies, this study also investigated agriculture-related education in foreign countries.

The results of this study led to the following suggestions to better cover the functions and values of agriculture, fishery, and food industry in the primary and secondary school textbooks: 1) incorporate agriculture, fishery and food industry related educational contents according to students' learning levels; 2) assemble, develop, assort and distribute educational materials related with agriculture, fishery and food industry; 3) enhance the

awareness of teachers and textbook writers on agriculture, fishery and food industry; 4) develop textbooks that contain systematic educational contents on agriculture, fishery and food industry; 5) operate a standing committee to monitor textbooks at primary and secondary schools; and 6) build an administrative base to increase the effectiveness of such projects.

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### 3.23 Current Status of Foreign Women Farmers and Measures to Improve Korean Women Farmers' Status

The main purposes of this study are as follows: 1) to compare Korean women farmers' status and related policies with foreign women farmers' status and related policies; 2) to define the concept and standard of agricultural co-manager; 3) to suggest measures to improve Korean women farmers' status.

The major research methods were collection and analysis of existing data, interview, and so on. Existing related data were collected by searching the data of related research institutes and governmental organizations. Descriptive statistics such as frequencies, percentage, and mean were used to organize and summarize the data.

In the ratio of manager and co-manager, Korea has been lower than foreign countries. In the EU, the definition of assisting spouse was amended. Assisting spouse refers to a spouse or a life partner of a self-employed worker, not being an employee or a business partner, where the partner habitually participates in the activities of the self-employed and performs same or ancillary tasks.

In this study, agricultural co-manager refers to a man or a woman who participates in agricultural activities with his (her) manager and performs same or ancillary tasks. The standards of agricultural co-manager were suggested.

The major measures to improve Korean women farmers' status are 1) defining the concept and standard of agricultural co-manager, 2) establishment of women farmers' legal status, 3) diffusion and improvement of family management agreement system, 4) improvement of agricultural management body registration system, 5) improvement of original land registration system, 6) improvement of taxation and property possession system, 7) education and propaganda of farmer confirmation system, and 8) others.

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### 3.24 Final Report of the 12th World Congress of Rural Sociology

The World Congress of Rural Sociology was held between the 6th and 11th of July in 2008 at the KINTEX in the city of Goyang, Korea. The Korean Rural Sociological Society (KRSS) and the Korea Rural Economic Institute (KREI) jointly hosted the conference. The major events held during the period were opening ceremony, plenary session, special forum, welcome reception, welcome dinner, farewell dinner, and excursion. The main theme of the Congress was “Envisioning Prosperous Rural Future in a Globalizing World.”

The World Congress Organizing Committee and the Secretariat Office were the most important acting organizations in preparing and implementing the conference. The Congress’s website was open to public for pre-registration and accommodation booking. The website of the International Rural Sociological Association accepted abstracts of papers and session organization applications.

During the Congress, 441 scholars from 48 different countries participated in 77 sessions. Two hundred forty papers were presented and discussed for four days. A special forum, under the title of “Vision of Korean Agriculture and Rural Society and Its Development,” was also held. William Friedland, professor emeritus of the University of California at Santa Cruz, and other four renowned speakers were invited to deliver keynote speeches.

A questionnaire was distributed to the participants to collect their opinions about the conference; 24% of respondents replied that they were “very satisfied,” and 48% were “satisfied,” while only 6% said they were “not satisfied.”

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AGRICULTURAL OUTLOOK  
AND INFORMATION

4

## 4.1 Korea Agricultural Simulation Model and Livestock Quarterly Model

In accordance with an agreement reached in July 2007, the KREI Agricultural Outlook & Information Center has been working on a co-project with the Food and Agricultural Policy Research Institute (FAPRI-MU) of the University of Missouri to improve the agricultural outlook models and ultimately enhance the forecasting ability of the center. The two institutes entered into the agreement that would result in the development and delivery of a new KREI-COMO (KREI-Commodity Model) and expansion and updating of the KREI Quarterly Livestock Model to be estimated by FAPRI.

In December 2007, the new model's first version was used to make the 2008 Korean Outlook baseline and tested the model's performance under some economic shocks. Initially, only 46 commodities were chosen as the new model's forecast items. However, in January 2008, FAPRI decided to establish a new KREI-Agricultural Simulation Model (KREI-ASMO) for the entire Korean model system so that it can have more realistic prediction results for a larger number of commodities.

The new KREI-ASMO 2008 contains 61 commodities, macro indices and an agricultural total value module modeled in this project, which covers 1,295 equations and formulas and uses 1,762 variables. The model is econometrically estimated by the OLS dynamic simultaneous equation model and is produced in a user-friendly Excel spreadsheet. This paper provides a summary of this process to provide an insight into the final model delivered to KREI. Appendices are added to summarize the procedure of using the Excel model. The steps followed in constructing the model are 1) review of Korean agriculture, 2) conceptual framework, 3) elasticity, and 4) dynamic system performance.

The new KREI-ASMO 2008 consists of the following five

sectors that simultaneously interact with each sector: 1) macro index sector, 2) input price sector, 3) crop sector, 4) livestock sector, and 5) agricultural total value sector. The system of Korean econometric models is a simultaneous, non-spatial partial equilibrium restricted on the agricultural industry system designed for the purpose of policy analysis covering whole commodities in Korea.

As for the KREI Quarterly Livestock Model, beef, dairy, pork, broiler and hen sectors are modeled in this project. The model is econometrically estimated by the dynamic simultaneous equation model and is produced in a user-friendly Excel spreadsheet. This paper will provide a summary of this process and provides an insight into the final model delivered to KREI. In addition, appendices are added to summarize the procedure of using the Excel model.

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## 4.2 How to Improve the Financial Conditions of Dairy Farmers

The financial conditions of dairy farmers became worse during the past 6 years because the raw milk price received by dairy farmers stayed constant although the feed price and TMR price rose a lot. An analysis of the financial conditions of dairy farmers shows that the net profit of dairy farms in 2008 will drop substantially because the cost of producing raw milk will increase by 20 percent from the previous year.

There are many kinds of dairy policies in developed countries such as the US, EU, and Japan. The policies are for stabilizing the financial conditions of dairy farmers and they can be categorized into three groups. One group is about international trade policies such as export subsidies or import tariffs. Another group is about domestic policies such as price support, marketing orders, or direct payments, and the last group is about subsidies to dairy farmers for sustaining the environment, such as cleaning air or reducing water pollution.

This study suggests following several policy options to improve the financial conditions of domestic dairy farmers: 1) collect money for stabilizing feed prices, 2) prepare one-stop service consulting network, 3) improve marketing channels of roughage, 4) allow the farmers' corporations to have import quota, 5) reconsider the plan to reduce the roughage quota, 6) support dairy-cow reforms and technical improvements, 7) research to increase milk consumption, 8) introduce price differentiations for raw milk according to its final use, its use in time (seasonality), and its components, 9) improve the quality of raw milk, and 10) make complexes for dairy farms.

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### 4.3 Economic Efficiency of Developing Crop Fields in the Hwaong Reclaimed Land

The purpose of this study is to assess the needs for farming in a reclaimed land and to suggest a course of future field-developing business in the reclaimed land, considering changing agricultural environments. Specifically, the first purpose is to set the goal of cultivating field crops in the reclaimed land and the second is to evaluate the economic efficiency of utilizing the Hwaong reclaimed land as a farming complex.

In Chapter 2, this study outlined the prospect of the domestic and foreign supply and demand of farm products and indicated that international grain prices will keep rising for a while.

In Chapter 3, the development status of the reclaimed land and the methods of developing the field soil are examined. A total of 38,588 hectares (in 2007) of the reclaimed land are available as a farming area. But the soil of the reclaimed land is unfavorable compared to a normal one physically and chemically. Therefore, to use the reclaimed land as fields, removing salt is necessary and desalination methods should be different depending on the purpose of farming.

In Chapter 4, the development status of the Hwaong reclaimed land and a general plan for a farm complex are examined. Being geographically close to a harbor and a large consuming area, the reclaimed land has the advantage of satisfying various development demands such as producing and exporting high value-added farm products. But as this area has sandy soil fine enough to have concerns over damages from being damp, artificial drainage facilities are needed. To develop a farm area in the Hwaong reclaimed land, a fruit (grapes) area is considered the most appropriate, followed by an export area of greenhouse vegetables and flowering plants. And



a food crop area, a stock raising area and a new reproduction bio-area are the less suitable.

In Chapter 5, the economic efficiency of growing field crops in the reclaimed land is analyzed. First, the following shows estimated incomes that can be earned from cultivating different crops in the reclaimed land: a greenhouse floriculture area shows the highest income level with 163.350 million won per hectare, followed by a vegetable area with 102.718 million won per ha, a fruit growing area with 30.316 million won per ha, a food crop area with 9.839 million won per ha, a livestock area with 9.420 million won per ha, and a new reproduction bio area with 1.972 million won per ha. Second, the import substitution effect is projected to be the highest in a fruit growing area with 10.273 million won per ha, followed by a livestock area with 9.033 million won per ha, a new reproduction bio area with 4.249 million won per ha, and a food crop area with 2.848 million won per ha in that order.

In Chapter 6, farm product yield and earnings are calculated with 3 scenarios for the Hwaong reclaimed land. The highest earning is obtained in Scenario 3, considering the government policy, the food self-support goal and the import substitution goal. In Scenario 3, the guaranteed effects are 64.016675 billion won of a farming family's income (30.096 million won per ha) a year and 11.881 billion won of import substitution effect a year. Next, the variations in a farming family's income and import substitution effects are considered depending on the changing oil price and exchange rate. A farming family's income decreases to 29.120 million won per ha with a 10% increase of oil price. It increases to 31.072 million won per ha if oil price drops by 10%. An additional 1.188 billion won of import substitution effect is estimated when import substitution amount increases to 13.069 billion won from 11.881 billion won with a 10% rise in both oil price and exchange rate.

In preserving the reclaimed land as a farming land, there are

following advantages: coping with an uncertain future supply and demand status of farm products and acquiring about 30 million won per ha of a farming family's income and an import substitution effect of 5.30 million won per ha. To achieve these goals, the following are needed: First, keep the farm area with a proper goal by publicizing the reclaimed land. Second, develop a field-crop producing area through wide use of paddy fields and non-paddy fields. Third, provide financial support to stabilize farming in the reclaimed land early.

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#### 4.4 The Current Status and Issues of the Bell Pepper Industry in Korea

This study aims to find development strategies for the bell pepper industry by investigating the production and marketing of bell peppers, and provide basic information for designing policies concerning the bell pepper industry.

As bell peppers have been recognized as a high-income crop, the cultivation area of bell peppers has been on the rise. In 2007, the cultivation area of bell peppers was 343 ha, three times larger than that of 2000. Since the domestic consumption, as well as export, of bell peppers has been increasing, the domestic policy for the production, marketing, and consumption of bell peppers needs to be overhauled to reflect changes in both the domestic consumption and export. In this regard, this study made the following findings:

First, since domestic consumption may act as a bumper for export, domestic consumption of bell peppers should be expanded further to secure their export.

Second, the domestic consumption of bell peppers is increasing. In 2007, 56 percent of bell peppers was consumed in the domestic market. The per capita consumption of bell peppers in 2007 was 376g, six times more than that of 2004.

Third, Korean bell peppers are preferred by the Japanese buyers since the commodity has a comparative advantage in terms of price and quality. To increase the export of bell peppers to the Japanese market, price should be lowered.

Lastly, bell peppers are one of the crops that have been developed through export. The bell pepper industry grows when marketing of bell peppers is smoothly linked with consumption based on stable production. Producers, therefore, need to organize themselves to expand in both domestic and foreign markets and enhance the competitiveness of the bell pepper industry.

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Report No: C2008-22/Jul. 2008

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## 4.5 Agricultural Outlook for 2009

Agricultural Outlook for 2009 provides short- and long-run baseline projections for the agricultural sector until 2019. It deals with major agricultural and rural development policy issues. Projections cover agricultural commodities and aggregate indicators of the sector, such as agricultural population, agricultural production, value added, and farm income.

The projections are based on the assumptions regarding the macro-economy, domestic agricultural policies, DDA (Doha Development Agenda), and the Korea-US FTA (Free Trade Agreement). Among them, farm household income in 2009 is forecasted to be 31.3 million won.

The annual report has three parts. Part 1 discusses the outlook for the world and Korean economies, the outlook for rural and farm earnings in 2009, and DDA (Doha Development Agenda) and FTAs (Free Trade Agreements). Part 2 deals with various issues: a way out of agriculture, food industry and safety, the environment and energy, farm management stability and rural development. Part 3 is a forecast for commodities such as grains, livestock, vegetables, fruits, and forestry foods in the Korean and international markets.

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Report No: E04-2009

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## 4.6 Quarterly Report on the Agricultural and Rural Economy

This report addresses mid- and long-term agricultural trends using key domestic and international economic variables such as GDPs, oil prices, bond rates, exchange rates, and prices of major agricultural commodities. This quarterly report touches upon domestic and international micro- and macro-economic situations, rural economic trends, international agriculture, agricultural commodities, and special issues.

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## 4.7 Monthly Vegetable Outlook

The purpose of the Monthly Vegetable Outlook is to help farmers improve farm planning and marketing strategies by providing information on the supply and demand trends of vegetables, their prices, and short-term forecasts. As vegetable prices are usually unstable, outlook information on vegetables is also crucial to the central and regional governments' planning for stabilizing the agricultural market.

The major contents of the monthly vegetable outlook are 'intended and actual planted acreage,' 'growing situation and yield,' 'estimated production,' 'inventory,' 'import and export amounts,' 'price trend and forecasts,' and 'meteorological forecasts.' The commodities included in the outlook are Chinese cabbage, radish, carrot, cabbage, white potato, red pepper, garlic, onion, Welsh onion and wakegi.

Monthly Vegetable Outlook is published on the first day of every month, and its copies are sent to farmers, agricultural organizations such as the National Agricultural Cooperative Federation, wholesale markets, agricultural technology centers, etc.

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## 4.8 Monthly Fruit Outlook

The fruits covered in this study are apples, Asian pears, citruses, sweet persimmons, grapes, and peaches produced as main fruits in South Korea. This study provides survey and forecast information on the prices and quality of six fruit commodities. We expect that the information will contribute to the rational setting up of strategies for the farm planning and marketing of the fruits. The information on the supply and demand of the commodities is crucial to the central and local governments' planning for stabilizing the agricultural market and farm household income.

This research contains information on the annual acreage, production quantity, price trends (including short-term forecasts), quality levels, and consumer behavior with respect to the six fruits. Also, information on import and export quantity and price is provided.

The central and regional advisory committees reviewed the draft of the monthly outlook and it was finally published and distributed to farmers, marketers, regional extension workers, and policy makers after surveying the sample farmers and analyzing the survey results. In 2008, the monthly outlook was published eight times and the prompt report was published twice.

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## 4.9 Monthly Outlook on Fruit-Bearing Vegetables

In Korea, the agricultural market environment has changed dramatically as foreign agricultural products are imported. Korean farmers can no longer be supported by the price subsidizing of the government. Also, wholesale prices of fruit-bearing vegetables are getting volatile more than ever before. Therefore, farm producers should pay more attention to the market trends of price and volume.

The purpose of this study is to enhance the credibility of information on whether the production volume and price of each commodity are increasing or decreasing each month so that it may induce farmers, wholesalers, and the government to make reasonable decisions.

The Monthly Outlook Report provides information (market supply, prices, etc.) associated with fruit-bearing vegetables. The outlook report covered the following seven commodities in 2008: cucumber, pumpkin, watermelon, oriental melon, tomato, strawberry, and green pepper. The main contents of this report are research and analysis data of expected cropping acreage, harvest acreage, regional yields, production, export and import trends, prices, etc.

By aggregating data and developing a supply-and-demand model for flexibility, yields, price-elasticity functions, etc., this research endeavors to forecast the short-term market outlook (on harvest acreage, volume, and price usually one or two months in advance) considering wholesale market trends. The research also goes through a pre-screening of the Central Advisory Committee for the drafting of the monthly outlook reflecting experts' viewpoints.

In 2008, 10 monthly outlook reports and a news bulletin were published.

In 2008, the farm acreage of fruit-bearing vegetables

(seven crops) has increased to 61,068 hectares, a one-percent rise from 2007. There were three notable market conditions in 2008. The first was an increase in oil price which caused a rise in the running cost of production. The second was decent weather. Good growing weather made the yield up and price down. These two conditions had the bad effect of lowering the income. The third condition was the rise in exchange rate. We anticipate that this situation will make domestic agricultural products competitive for export. However, we expect the farm acreage will drop to 59,906 hectares in 2009.

About 15,000 copies of the outlook reports on fruit-bearing vegetables were published and distributed to farmers, marketers, extension workers, businessmen, and policy makers from March to December of 2008. The reports were also available for viewing on the Internet ([aglook.krei.re.kr](http://aglook.krei.re.kr)) and the websites of the Korea Rural Economic Institute and the Ministry for Food, Agriculture and Forestry. The outlook results were also published in a number of local newspapers dealing with agricultural issues.

Researchers: Eun-Mee Jeong(Ph.D.), Hak-Kyun Jeong(Ph.D.), Won-Tae Kim, Su-Rim Kim, Min-Soo Kang and Sun-Hee Yoon  
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## 4.10 Livestock Outlook

In Korea, livestock prices are known to fluctuate greatly due to supply and demand conditions. Rapid price changes are harmful to farmers in managing their farms because output price is the most important factor in deciding the farm revenue.

The objective of 'Livestock Outlook' is to improve farm planning and marketing strategies for livestock products through the reporting of outlook information to farmers. It is also used to help traders make business plans and help policy makers make policies for stabilizing the market.

The contents of the livestock outlook include number of livestock head, number of slaughters, feed production, export and import, price trends, and short-term forecasts on number of head and prices. The short-term price outlook for livestock is dominated by two factors: supply and demand. The main factor on the supply side is the number of slaughters, while those on the demand side are economic conditions and consumers' behaviors.

The livestock outlook is published both monthly and quarterly. It includes information on prices, supply-demand conditions, and short-term forecasts on five livestock commodities, and these are Hanwoo (traditional Korean cattle), dairy cow, pig, and chicken. The chicken outlook is published monthly and the others are published quarterly.

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## 4.11 Quarterly Rice and Soybean Outlook

The main objective of this study is to provide market information and short-term forecasts on rice and soybean and help stakeholders make better production decisions and set up marketing strategies.

The Rice and Soybean Outlook reports contain information about current prices, consumption trends, trade and stock situation, supply and demand estimates, and short-term price forecasts of rice and soybean. The reports also provide information about the world rice and soybean markets using USDA Rice Outlook and World Agricultural Supply and Demand Estimates.

The Rice Outlook is issued quarterly (January, May, August and November) and is additionally published as a flash board during the harvest season (September and October). The Soybean Outlook is issued quarterly (January, May, August, November).

The reports are distributed to farmers, rice processing complex (RPC) managers, soybean processing companies (SPC), grain brokers and government agencies.

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AGRICULTURAL STRUCTURE &  
BUSINESS MANAGEMENT RESEARCH

5



## 5.1 The Effects of Opening Korean Agricultural Markets through the Uruguay Round Agreement

This study aims to analyze the effects of market opening on the Korean agriculture and evaluate the ex post impacts on the industry as a whole and on its major comprising products on an item-by-item basis.

Korea entered the GATT in 1967. Since then, the domestic agricultural market has steadily been opening up to foreign goods, and today the market opening rate stands at 99.1% (as of 2007). In terms of agricultural import trends by commodity groups, grain imports have stagnated; however, livestock products and fresh agricultural produce such as vegetables and fruits have been entering the domestic market at increasing rates. Moreover, the market opening has led to changes in the demand for agricultural products.

The additional market opening after the UR led to an increase of consumer surplus and a decrease of producer surplus. The decreased amount of producer surplus is estimated at 563.3 billion won, and the increased amount of consumer surplus is estimated at 611.8 billion won for a total of 17 agricultural items. On the whole, there is an increased supply of 48.5 billion won on average annually. However, because the number of consumers is much larger than that of farmers, the damages from expanded market opening is concentrated on farm households.

According to an inter-industrial analysis, a decrease of 829.6 billion won in total agricultural output is estimated due to both production and price decline from market opening.

The opening of the livestock market, in particular, is faster than that of the farm produce market, and the market opening of vegetables and fruits is even more striking. As a result, domestic agricultural indexes as well as GDP, farm household income, cultivated area, and livestock inventory are showing declines.



In the case of grains, import amount increased while domestic production decreased. Accordingly, the role of the government in the grain market has been curtailed.

In the case of farm products, domestic price declined due to import expansion, and cultivated area and farmer's income dropped as a result. Although the number of farmers cultivating farm products fell, attempts are made to gain competitiveness and new technologies, and realize a scale of economy.

In the case of the livestock sector, domestic production rose steadily along with the improvement of scale, specialization, and technological advancement, but the increase rate of Korean beef growers' income slowed down. As for price, the fluctuation, increased in the case of beef and pigs but decreased in the case of broilers.

The implications for policy making from this study are as follows: first, it is important to gain public understanding about the market opening and trade liberalization; second, the process of building a public consensus is essential in trade negotiations; and third, it is necessary to intensify ex ante domestic measures for agricultural market opening.

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## 5.2 An Approach to Advanced Agricultural Policy toward Open Economy - Strategy and Task (2/2years)

We expect changes in the environment of agriculture and rural areas, which includes full market opening, a mature society based on knowledge, an advanced country, and an elderly society. Drawing implications from the experience of major advanced countries, this study aims to derive tasks and strategies for formulating advanced agricultural policies.

The report is comprised of three sections. Section 1 defines problems of agriculture and rural society. Because of the changes of domestic as well as foreign environments, the Korean agriculture and rural society face various fast-changing problems. Section 2 elicits tasks for guiding local farm policies to advanced country-level farm policies by learning from the experience of the US, the UK, the Netherlands, and Japan that have carried out farm policy reforms recently. Policy reform is carried out in every five years in these countries and one common feature of farm policy among them is the role assignment that covers from the policy's formulation to administration and evaluation. The roles of central and local governments, producer associations and other interest groups are clearly defined and well kept. For example, the central government sets up policies and local governments carry out policies. In addition, we can not disregard the problems native to each country. The US takes stabilization of farm management seriously while the UK and Japan place emphasis on food safety, multi-functionality and structural reform.

Section 3 suggests tasks for drawing farm policies fit for an advanced country and the concluding Chapter 14 presents visions and applicable strategies for the continuous development of agriculture and rural areas based on findings from evaluating the current problems and policies.

It is essential to have a competitive agricultural industry and rural areas attractive to local citizens for the continuous development of agriculture and rural areas. We set up a vision for agriculture as “world’s top-class high-value-creating technological agriculture,” and rural areas as “space that anyone wants to stay and live.”

We set up five long-term policy targets. They are 1) high technology agriculture, 2) stable supply of safe foods, 3) stable income and life for farmers with small- and mid-sized farms, 4) value creation in rural areas, and 5) farm policy that recognizes we are a part of the earth.

Four strategies are required to achieve the policy targets. These are 1) improve the efficiency of policy implementation, and adjust the roles between the central and local government, 2) develop the industry’s potential through intensive investments on export, demand creation, food industry, and green growth, 3) improve compatibility by systematizing agricultural enterprises, and 4) remove conflicts, increase income stability of low-income farmers, and recover policy trust.

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### 5.3 A Study of Risk Management Strategies for Specialized Farm Households

This study aims to suggest risk management strategies for specialized farms by analyzing the risks they face. We define and classify agricultural risks based on their cause and the likelihood of occurring. It is analyzed that production risks are related with climate change and animal disease, factor price risks with sudden price increase of raw materials such as oil and crops, financial risks with debt, and human risks with aging society. Therefore, risk management for specialized farms has to be recognized with a comprehensive point of view rather than a specific one.

According to our research on the actual conditions of risk management for specialized farms and fluctuation of farm income, more specialized farms have a higher rate of agricultural income and face more risks due to uncertain realities of agriculture such as market opening. Therefore, it is essential that the farms try to maintain a stable farm income and decrease debts, rather than invest excessively to increase the scale of farming. Although there are already many policies funded by the government, specialized farms need to exert their own effort to improve risk management.

The strategies offered in this study are, first, to do risk management through systematization and avoid the disadvantages of small farming, second, to transfer revenue insurance such as crop and accident insurance further into income stabilization schemes, third, to introduce an 'income equalization' tax system, and, fourth, to prepare legal instruments to protect weak farmers under contract with processors, packers and distributors.

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#### 5.4 A Study on Reforming the Farmland System to Better Reflect Socio-Economic Changes (1/2)

Although the current farmland system is asked to play a new role due to circumstantial changes surrounding the Korean agriculture, it has not worked properly to respond to the demand. As a preliminary step to derive a blueprint for an ideal farmland system next year, this study investigated today's operational status of the farmland system and analyzed the economic efficiency of land usage.

By using the land usage classification we designed for the study, we selected three counties (the administrative districts of "ri"), each of which is comprised of several villages, for case study and investigated the whole farmland in the areas. According to our investigation, it was shown that 19~33% of the sampled farmland was illegally owned and 42~57% was illegally leased. During the last 10 years, the number of farms cultivated directly by landowners decreased whereas leased farming increased. Most farmers in the sampled areas had a plan to retire or shrink the size of farming rather than expand their business in the future.

An analysis of economic efficiency of land usage showed that the rent payment capability of tenant farmers increased as business size grew bigger. Accordingly, the increase in land usage efficiency would work as an incentive for a small farm to become a large farm with more than 3ha of farmland. In a net present value analysis, we found that an increase of farmland by leasing is more efficient than a farmland increase through purchase because the expected profit from buying farmland is smaller than the opportunity cost. According to the Granger causality test, the farmland price in suburban areas has a Granger causality relation for rent whereas the rent in plain fields has a Granger causality relation for farmland price.

We also estimated the size of farmland needed by 2020.

According to the estimation made by the KREI-ASMO model, it was found that if today's changing trends in the size of arable land and the land being cultivated continue (assuming that the DDA and the Korea-US FTA do not go into effect), the necessary farmland in 2020 would be 1,564 thousand ha. As for the demand of land for city and industrial complex development under the 4th Land Reconstruction Plan for the 2000~2020 period, the necessary land would amount to 385 thousand ha. Meanwhile, the land available for development is estimated at 816 thousand ha (138 thousand ha of farmland and 678 thousand ha of non-farmland areas), which is sufficient regardless of whichever scenario is applied for the future demand. Even in the Seoul metropolitan region where the demand for development is high and the supply is limited due to development restrictions, it was found that there would be no problem in supplying necessary land.

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## 5.5 An Improvement of Compensation Policies for Agricultural Market Opening in Korea

The purpose of this study is to make a suggestion on how to improve the current compensation policies for the agricultural market opening in Korea and prepare for further policy reforms with respect to future FTA and DDA negotiations.

For this purpose, we reviewed arguments for making compensations for policy reform. The questions as to “for whom, when, and how” compensation policies should be arranged were discussed. After reviewing similar cases of policy reform and adjustment assistance in Sweden, the United States, and Australia, we drew an implication for comprehensive improvement of the government’s compensation policy. A review and analysis of the current compensation measures for agricultural market opening in Korea was conducted.

Korea has been opening its agricultural market since 1978 when the cumulated trade surplus became a pressure for market opening. In 2004, Korea signed a free trade agreement with Chile and introduced direct compensation for fruits and closing down of orchards. In the same year, rice income compensation started in response to a continuous price fall and abrogation of purchasing autumn rice by the government.

The discussion of problems in the current compensation measures includes program items that are defined in the study as well as upper limits, preconditions to becoming a candidate, price or income benchmarks, and stability of budget.

The compensation principle is proposed, and this means that compensation policy should follow the following guidelines: the policy should be targeted and compensation should not overly pay, abide by the purpose of policy reform and be cost-efficient, transitional and easily removed once overdue, mixed with direct payments, indirect and implicit assistance, and operable with the

“ex-ante” and “ex-post.”

As for the current compensation policies including direct payment and indirect assistance, the following recommendations are made: The assistance for closing down orchards and the fixed payments compensating rice income are transitional and their due dates should be defined. The production compensation measures such as ‘rice income cyclical payment,’ ‘FTA payment,’ and ‘calf price payment’ should be combined with farm income stabilization programs to secure reliability. The indirect assistance to build up the competitiveness of farmers will be more important as we further open the market.

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## 5.6 Strategies for Revitalizing the Systematization of Agricultural Enterprises

The objective of this study is to figure out what effect the systematization of agricultural enterprises has on production at the village level and derive a scheme to revitalize the systematization.

Although the fostering of primary full-time farmers is a core policy in building up the competitiveness of agriculture, we need to develop a method of increasing production efficiency while assisting old low-income farmers. This need arises because primary full-time farmers can not manage all the farmland to be cultivated.

The systematization at the village level possesses corporate characteristics since most of cultivated land can be rented out in the long run and become a production core. Then a management strategy incorporating all relevant production resources such as land, labor, and capital can be laid down in an economy of scale. A new way of utilizing land with new production technologies and business-minded decision making is also expected to emerge through the systematization at the village level.

As an example of our study, we surveyed Natur, a farm directly managed by Jusansarang, an agricultural cooperative of Sunchon, and the farmers who rent out farmland to them.

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## 5.7 A Case Study of New Technology and Farming for Agricultural Vision

The Korean agriculture is facing a great ordeal. While the financial balance is getting pressured as the world prices of crops and petroleum have jumped, the DDA agreement is rising as a new threat along with the FTAs that were reached last year. Just like the proverb saying “Look far whenever there is a difficulty,” it is time to gather wisdom for a long-term vision of agriculture.

This study is summarized in five parts: first, the difficulty of agriculture and technological innovation, second, technological development of elevated-bench hydroponic system for strawberry cultivation, third, direct seeding with applications, fourth, TMR Feeds using improved barley, and lastly, traceability of Korean beef cattle using RFID.

The means of overcoming the difficulties of the Korean agriculture is explained to be found in the connection between agriculture and food industry, development of new technologies in which IT, BT, and NT can be used in agriculture, marketing and management that are urgently needed at farming fields, and the development of new technologies that can cope with the demand for eco-friendly technologies.

The technology of elevated-bench hydroponic system for strawberry cultivation points out that continuous cultivation is difficult with aged labor because the intensity of labor is severe in the current strawberry management and harvesting method. But the new elevated-bench hydroponic system has shown that it can contribute greatly to an increase of farm household income as labor intensity is low and the scale of business can be expanded.

The technology of direct seeding with applications has shown that rice planting has many limitations when there is a labor shortage, and the higher possibility of expanding business scale reduces the labor and makes up for the disadvantages of

existing technologies and increases the possibility of raising price and quality through increased productivity and reduced labor.

The idea of developing TMR Feeds using barley came into being based on the thinking that the increase of raw material costs from the recent rise of international crop prices is responsible for the deteriorating management of farmhouses, and therefore a feed cost reduction plan to develop TRM PLANT came to light as a way of overcoming this problem.

A traceability study of Korean beef cattle using RFID has shown that, since the RFID beef tracking system can restrain the illegal circulation of imported beef as Korean beef, it can improve the business performance of local livestock farms and stabilize the domestic consumption.

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## 5.8 Child Welfare and Policy Tasks in Rural Areas

The purpose of this study was to find out why there exist children who do not receive nursery services in rural areas and show ways to make institutional and policy improvements.

We selected four counties for the case study and two counties for reference. These are Youngdong, Buan, Sangju, and Youngyang as case study areas and Jinan and Hongcheon as reference areas. We interviewed policy implementers, heads of nursery facilities, parents, and social workers.

Several problems were found. The first problem lies in the shape of governance. Several ministries in the central government and several bureaus in local governments have implemented similar child welfare policies. This situation resulted in lowering specialty and policy ineffectiveness, the increase of administration costs, and differing qualities of welfare services. Secondly, the rules regulating the operation of child welfare policies are more likely to benefit the urban areas than the rural ones. For example, there are no kindergartens in several Myons due to administrative limitations and burdens of local governments, and so on. Thirdly, there are children who do not receive policy benefits due to their geographically remote residence, disability, and multi-cultural families. Fourthly, some persons who are not farmers receive government support illegally. Also, some farmers who self-nurture their children and receive support spend it for other uses. Fifthly, some farmers cannot receive support because of the ways their income is determined as in the calculation of farming facilities.

There are some policy tasks to improve the quality of nurturing. The first task is to return child welfare administration from local governments to the central government and set up a different welfare system for rural areas. Secondly, it is very difficult to establish a kindergarten in rural areas because of the gradual decrease in the number of children and the low possibility

of establishing private kindergartens. However, in order to ensure that no one is excluded from the policy benefits, the government should establish new kindergartens for excluded children. Thirdly, a special consideration should be given to disadvantaged groups such as multi-cultural families and economically worse-off families. Fourthly, the government should make some solutions for recruiting teachers.

In the long run, nurturing should be a kind of compulsory education. Also, the government should consider a new child welfare system for rural areas different from the urban one. Lastly, an institutional rearrangement is necessary: Ministry for Health, Welfare, and Family Affairs or Ministry of Education, Science and Technology.

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## 5.9 A Strategy to Stabilize the Domestic Market and to Increase the Competitiveness of Korean Green Tea Industry

The green tea industry in Korea has been growing steadily in the last 10 years as consumers are placing more emphasis on the well-being of themselves. However, due to the recent and wider market opening and changing consumption patterns, the balance between demand and supply is in great danger.

The purpose of this study is to make strategies to increase the competitiveness of the Korean green tea industry and stabilize the domestic market as well. In Korea, the total area for growing green tea leaves has expanded about four times and production has increased more than five times during the last ten years. China experienced a 1.3 times increase in the growing area and 1.7 times increase in production during the same period. In Japan, the area has decreased and production was about the same. All the major green tea leaf growing countries in Asia have struggled to expand their tea industries.

Four basic rules are suggested to build a more stable tea industry in Korea. First, the size of tea growing area should be controlled properly based on a long-term projection of the market by the local government with major tea growing producers. Second, in each growing district, it is necessary to set up a organization consisting of representatives of producers that will control the supply of tea leaves by themselves. Third, for food safety, it is necessary to have extensive supervision of imported tea products in terms of origin and production practice.

There are various tasks to be performed to improve the competitiveness of the Korean tea industry. It is essential to maintain the good quality of tea leaves that are produced environmentally friendly. We also need to foster core businesses in local regions and encourage them to cooperate in building a

fermented tea processing system. To promote the consumption of high-quality tea and facilitate systematic education of tea serving, each tea producing district needs to have its unique characteristics and be distinguishable from other tea producing districts. Instead of trying to be protected within the acquainted domestic market, domestic green tea producers are required to be equipped with high-quality products and then carry out an aggressive global marketing to challenge world producers.

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## 5.10 Research on Improvement Measures for Farmland Preservation Taxes Relief

The Farmland Preservation Tax System was established in 1972 based on the 'Farmland Preservation Law,' and has been revised a few times since then. This law is unique to Korea, and is intended for 1) restraining farmland conversion, 2) maintaining the total area of farmland by creating new farmland, and 3) scaling up the agricultural management size by imposing taxes partially to pay for the creation of farmland and also to collect a part of the profits stemming from the development of converted farmland.

The farmland preservation tax is inherently a 'due imposed on causer' but it has also the characteristics of a 'due imposed on beneficiary.' This is basically a dual tax in that two different taxes are being imposed on a single act of farmland conversion. That is, Farmland Preservation Tax is imposed as a tax due on the initiator, and Development Tax is imposed as a tax on the beneficiary.

In improving the farmland preservation tax relief act, the relief clauses should be simplified and consolidated as with the relief act on the development tax. In principle, the relief would be 100% only when a farmland conversion is for the public purpose of a local government, and 50% for other cases. Firstly, the principle would be based on the tax relief principles used for 'Alternative Forest Resources Creation Fund.' It means that the relief clauses would be applicable in three cases: 1) when a conversion is for national or local government's public purpose, 2) when a conversion is for establishing a main industrial facility, and 3) other cases. As in Development Tax, 100% relief would apply only when the conversion is for the public purpose of the national or a local government, and 50% would apply in other cases, in principle.



Secondly, any farmland conversion within the designated areas for agriculture promotion would be excluded from the tax relief. Thirdly, the tax relief for industrial purposes and other cases should be overhauled extensively. In principle, tax reliefs on public facilities and farm-dedicated lands that have been reported are justifiable, but tax reliefs on industrial facilities are different cases because the relief is for private beneficiaries.

Remedial measures are needed in relation to the intentional removal of the Farmland Preservation Area status solely for the purpose of tax relief. There are cases of such intentional removal for the tax relief purpose, and a tax based on the original status ought to be imposed even when such a removal has been enacted.

The tax collection rate of the Farmland Preservation Tax is low, and therefore surcharge should be introduced for overdue taxes. By introducing this measure, late payments are expected to be reduced and the total collected amount would increase. Based on the principles of the Farmland Preservation Tax Relief, cases of time-limited relief should be sorted out. In order to update the statistics related to agricultural administration in a timely manner, the system should be streamlined in such a way that Korea Rural Community & Agriculture Corporation can take charge of the statistics related with the conversions.

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### 5.11 A Study on the Introduction of Direct Payment Policy for Upland Fields of Jeju Special Self-Governing Province

The objective of this study is to analyze the industrial structure of Korean upland fields and direct payment programs and design a direct payment program for upland fields of Jeju Special Self-Governing Province. Under the background of today's growing liberalization of agricultural trade, this study explores alternative measures to direct payments by seeking diverse ways of boosting farm household income and multi-functional roles of agriculture.

A major change in agricultural policy has occurred after the launch of the WTO system in 1995. In developed countries such as the US, EU, and Japan, agricultural policies are turning away from price support and production assistance to direct payment programs not connected to price and production. In step with such a movement, the Korean government has introduced a direct payment system as a means to support farmers' income and promote multi-functional roles of agriculture. However, most of the direct payment programs adopted in Korea have focused on the rice industry.

The direct payment for farm management transfer was first introduced in 1997, and the direct payment programs currently in operation are the direct payment for environment-friendly farming of 1999, the direct payment for less-favored areas of 2004, and the direct payment for rural landscape conservation of 2005.

This study was carried out to establish criteria that can be served as a reference in preparing a direct payment program for upland fields of Jeju Province. The study analyzes the contents of the WTO agreement and examines direct payment programs in the US, EU and Japan. There are two policy alternatives to design a direct payment for upland fields. The first policy alternative is

to establish a system link to compensate lower income earning farm households (fixed direct payment). The second alternative is to have increased operational efficiency and multi-functional roles of agriculture (added direct payment).

There are various components in designing a direct payment program for upland fields. These are target area, method, price, cross compliance, compliance reinforcement, application system, application period, etc.

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## 5.12 A Study on Agricultural Development of Saemangeum Reclaimed Land

The main purpose of this study is to provide a vision for agricultural development of the Saemangeum reclaimed land. For this purpose, this study examines the changing socio-economic environment of the Korean agriculture. The study laid down three principles with regard to the agricultural use of the Saemangeum reclaimed land and they are as follows: harmonize national goals with regional interests, set up flexible development plans for the future demand for agricultural and non-agricultural land, and gain international competitiveness with the synergy from related fields and industries. Under these principles, this study presents 'pursuit for a comprehensive agricultural complex based on human values and the environment' as the vision for the agricultural use of the Saemangeum reclaimed land.

To fulfill the vision, this study suggests three directions for farmland use: increase farmers' income by fostering agribusiness clusters, promote environmentally friendly recycling agriculture, and introduce eco-friendly green tourism in the area.

This study presents several land use options for the area: joint grain complex, recycling organic agri-complex, horticulture complex, center for advanced agricultural research, agribusiness cluster, agricultural theme park, villages, plant-nursing fields, reservoirs, ecological maritime arboretum, and so on. The study also shows necessary facilities, management plans, and economic efficiency of farmland use for each option.

At the initial stage, the farmland in the reclaimed area can be managed mainly by the government. The government can maintain a state-run farm or lease the land to individuals. To do so, the government can introduce a farmland conservation policy temporarily and then can lease or sell the land to whom that can maximize economic efficiency.

Tourist development and residential planning in the area are also studied in this research. For tourist development, this study introduces the idea of “complementary niche tourism” in the agricultural area. The main reason for introducing the idea is to reduce conflict with nearby tourist sights and tourism farms. Also, residence planning should be considered with a plan for urban residence in the agricultural area. Currently, rural residences have a tendency to directly connect with urban cities.

It is important to note that after the presidential election last year, the newly elected president announced a new approach toward the Saemangeum development. The announcement and a brand new development plan are affecting existing development plans and the study outcomes. Also, a new national agenda of “low-carbon green development” is adopted as a development strategy of the Saemangeum area. To effectively keep up with the changes, this study needs to reestablish the vision of developing the Saemangeum area and provide new action plans.

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### 5.13 A Study on Comprehensive Development Plan for Agriculture in the Suburban Areas of Daegu

The world is experiencing accelerated market liberalization alongside trade negotiations and agreements for DDA and FTAs. The agricultural policy changes in the context of market opening focus on multilateral functions of agriculture. The changes were made to compete with imports and they are predicted to have a strong influence on the local agricultural industry. Agricultural investment and related projects of local self-governments, in particular, constitute a major factor in determining the quality of life of local farmers and the competitiveness of the production and income of each farm household. Accordingly, the formulation and implementation of agricultural plans by local governments hold a significant place in the nation's overall agricultural policy.

This study examines regional, environmental and socio-economic features of the agricultural sector and rural communities of Daegu in the context of internal and external environments surrounding its agriculture and rural communities. The primary goal of this study is to make master plan suggestions for Daegu's suburban agriculture and communities by assessing their strengths and weaknesses.

The concrete purposes of this study are as follows: The first is to establish a direction for the development of agriculture and rural regions of Daegu based on the investment plan of Article 119 of the government's "Agriculture and Rural Development Countermeasures." The second purpose is to present a vision and a development strategy for agriculture and rural regions of Daegu after researching their available resources as of today. The third is to present a method of selecting and intensively raising specialized crops. And the last is to devise measures of guaranteeing the agriculture's competitiveness through environment-friendly agricultural products.

The vision and development strategy for agriculture and rural region of Daegu.

The development vision for agriculture and rural region of Daegu lies on “the green industrialization for both farmers and consumers.” In this respect, this study sets a goal of improving farmers’ quality of life through proper development and conservation of nature. To achieve this objective, this study presented four innovation strategies on agricultural industries, circulation of agricultural products, rural development, and development of agricultural human resources and support system.

The comprehensive innovation strategies could be summarized as follows:

1) The innovation strategy on agricultural industries

According to the city development plan of Daegu, the areas where a large agricultural production base can be maintained on a collective level are projected to be limited to water supply protection zones and development restricted areas. Under this projection, the agricultural production base of Daegu can be classified into the Mt. Palgong and Kumho River region and the Nakdong River and Mt. Bisul region. Based on these regions, development plans for major specialty products of Daegu can be formulated.

2) The innovation strategy on the circulation of agricultural products

As a major city in the southeastern part of Korea, Daegu has a large consuming base and it is expected to grow with the ongoing construction of new towns called “innovation cities.” Furthermore, the preference for high-quality and safe agricultural products has been expanding, and city dwellers’ contact with rural regions will grow together with their need for leisure and travel for recreation. Such being the case, opportunities are abound for

the marketing of Daegu's agricultural products.

3) The innovation strategy on rural development

The basic principles for rural development could be summarized as follows: First, agricultural and ecological tourism projects, such as green experience tours, should be developed to correspond to the liking of Daegu citizens. Second, the real income of farmers should be increased by enabling them to expand their farming businesses in conjunction with agricultural processing and marketing as well as eco-tourism. At the same time, the rural development strategy should strengthen the rural residents' capability and contribute to the balanced development of the region. Third, by building an eco-friendly image of Daegu, the city can raise the overall brand value of its agricultural products and inspire the local government to invest in rural-urban exchange projects.

4) The innovation strategy on agricultural human resources and support system

The new paradigm of knowledge-based agriculture requires farmers who can create and utilize knowledge to increase the value added of agricultural products. Therefore, it is necessary to build a support system that can foster human resources armed with new knowledge in the agricultural sector.

Investment plans are essential for carrying out the strategies. First, in selecting an investment project, it is necessary to comprehensively examine and consider the motivation of participating enterprises, ripple effects on the region, and the opinion of local residents. Second, the investment plan should be balanced with the central government's investment plan in view of the plan's high dependence on national expenditure grants and financial circumstances. Third, the investment plan should be selected by considering the overall framework of Daegu's other related investment plans.



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## 5.14 Research on Agricultural and Rural Development Plan for Pyeongtaek City

The world is witnessing today an accelerated opening of agricultural markets driven by the WTO, conclusion of FTAs between countries, and changes in the agricultural policies to focus on multi-functions of agriculture. These changes are making a huge impact on domestic agriculture, local administrations, and rural development plans. In this respect, developing agricultural and rural plans is becoming more significant.

To cope with the accelerated opening of the domestic market for agricultural products along with the globalization trend, this research tried to establish comprehensive preliminary plans for Pyeongtaek City's execution of its agricultural potential to utilize the current or incoming natural and financial resources.

In this research, environmental and socio-economic characteristics of the city are examined in depth. Also, economic values of Pyeongtaek's multi-functions of agriculture such as amenities and environmental benefits are evaluated by consumers. An assessment of strong and weak points is also made to come up with a comprehensive development plan for the agriculture and rural communities.

Based on the study's research results, we propose 'Garden City' as the vision for Pyeongtaek's rural development, where agriculture not only performs industrial functions but also preserves the environment against the expanding urbanization and provides various amenities to urban residents. In this regard, the following five strategies are suggested to bring about the vision.

First, "cluster type" development strategies should be reinforced to promote horticulture and the food industry. Also, processing firms, logistic facilities, and consulting agents for technical training should join in the cluster. Second, Pyeongtaek City should raise the value of the rice brand 'Super Oning' by

promoting marketing organizations in producing districts. This is the most important issue in enriching Pyeongtaek's agricultural industry. Third, research and development (R&D) schemes should be developed systematically for human resource and intra-regional development. Academic institutions including agricultural universities should provide educational programs to farmers in the city based on real needs. Fourth, the city should establish a farm income safety net to compensate for the intensifying instability of farm income. Finally, Pyeongtaek City should expedite functions of rural areas as public goods and improve the quality of life of rural residents.

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### 5.15 Agricultural Policy Reform of Direct Payment and Structural Adjustment in Korea

Decoupling agricultural support from production decisions has become a central issue in agricultural policy, both nationally and internationally. The WTO, for instance, proposed decoupled farm subsidies to support farmers without distorting commodity production or trade as in the case of a target price and production support system.

In this study, we suggest the following basic principles of reforming agricultural direct payments for the industry's continued growth. First, conversions should be made from commodity-based income stabilization to household unit-based income stabilization. Second, coupled direct payment should only continue for the time being. Third, a conversion should be made from income support to risk management and stabilization. Payments are triggered when average farm gross income falls below a predetermined reference gross income from an eligible commodity. The size of payment is determined by multiplying the national average price per unit of commodity by a program payment yield per unit area and the number of areas eligible for payment.

The reference trigger is 90% of reference gross income and stabilization ratio is categorized according to gross income decrease ratio. If reference trigger is too high, the responsibility consciousness of a farmhouse falls and it is difficult to win the understanding of the non-agricultural sector. But if the reference trigger is too low, the stabilizing effect will be insignificant and, therefore, conventional direct payments should be reflected in the reference trigger.

The maximum benefit per participant is set at 50,000,000 won after taking into account both large and small farms and the equity with low-income farm households. Also, the administration imposes a duty to raise responsibility consciousness and ensure

faithful registration. The participation fee is set at 1~2% of the reference gross income, and it is paid back in case of secession.

Since this policy aims to stabilize farm household income, all commodities shall be included; however, the direct payment has to be enlarged step by step in consideration of surrounding conditions. First of all, soybeans, livestock products (excluding dairy products), and fruit are primary target commodities as their nationwide statistics such as average price and yield are easy to obtain for policy enforcement and the Korea-US FTA is expected to have comparatively large damaging effect on them. Also, we judged that excluding non-commercial farms (which comprise a below meaningful level of farm units) can reduce administrative costs and does not impede the overall policy reform.

Basically, the agricultural income stabilization program is an alternative to the direct payment program for FTA damage. Therefore, this program can be introduced side by side with the farmhouse registration system, but the integration of this program with rice direct payment can be reviewed after 2013 or 2014 when the target price for rice direct payment is recalculated.

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### 5.16 A Study of Financial Recovery of Farms through Farm Workout Program

The purpose of this study is to establish a farm workout program assisting credit-crunched farmers to recover and continue working in the farming business. Farm household debts, which severely threaten the stability of the farm household economy, have been increasing steadily. On the government side, various measures have been introduced to solve the debt problem since the late 1980s. The National Assembly, too, took part in this endeavor and revised the Special Act of Lessening Farm and Fishery Household Debts in 2004. The main contents of these measures were to reschedule policy loan repayments, lower the interest rate, and supply special mid-term loans to farms suffering from the high burdens of debts and liquidity problems. However, these measures were not sufficient to resolve the financial stress on farms. The financial situation of full-time farmers in their 40s and 50s, in particular, did not improve even though they form the core workforce leading the Korean agriculture.

There already exist two workout programs for the public and they have been in force since 2000. One is administrated by “Credit Counseling & Recovery Service” whose members include more than 4,000 financial institutes and the other is run by the court of Korea. However, these are not sufficient to solve the financial problems confronted by farmers since they are unable to take into account the special circumstances of agriculture where farmland is both a capital and an essential production asset. Also, they do not cover the debt from policy loans, the main source of debt for farmers. Hence, a workout program for farmers should be introduced to help them recover from the financial stress and continue farming.

A new workout program will serve farm households as an alternative to debts. Many experts have been criticizing existing

debt measures as policy failures for distorting income distribution, causing moral hazard, and failing to reconstruct fragile farms. We designed a constantly-operational workout program that requires land liquidation to restructure farms. As a new supporting system for farms struggling under financial crisis, the program must be designed based on the principles of cost minimization, loss apportionment, and inducement of self-reliance in conjunction with the overall restructuring policy of agriculture.

There are several factors to consider in running a workout program. First, it is necessary to organize an executing committee which screens insolvent farms. It will sign a memorandum of understanding with farmers for the fulfillment of managerial rationalization, plan their overall financial restructuring schemes and monitor performance on payback and continuous farming. Second, the so-called “farmland bank” will purchase the farmland of debtors and subrogate their debts to creditors. It will ultimately run the program and farmers will pay back their loans under a more affordable interest rate.

To operate the workout program effectively, a call option for disposed farmland should be included in the program. The call option is the right of farmers to repurchase the land sold in the beginning, which we expect would disentangle the complication between the bank and previous landowners. With this scheme the utilization of agricultural fixed assets and resource allocation can be facilitated.

In conclusion, the program is for the farmers under high financial stress, who cannot pay off the debt in the short run but can afford to do so in the long run, while continuing farming. Either those whose financial stress is not high enough or those who are ready to exit farming due to age or some other reasons are not eligible for the program. We expect that the program will help the core farmers to recover from the financial stress and become competitive business entities who can lead the Korean agriculture in the world market.

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## 5.17 Agricultural Cooperative Federation

The purpose of this study is to prepare business innovation strategies of the subsidiaries of National Agricultural Cooperative Federation (NACF). We expect our study will help them set up innovation strategies so that they can adapt more quickly to the changing environment of the agricultural market, hence acquiring a competitive power in the long run.

The academics believes that the NACF has not taken an important role in marketing and supply operations, that is, putting less effort to promote business activities of primary cooperatives. A prior condition for establishing subsidiaries in the NACF was to promote speciality and efficiency in the agricultural business division. For this, an appropriate plan to revitalize the agricultural business division needs to be set up and executed first. In 2007, the NACF proposed a plan to fulfill the task.

In order to accomplish the purpose of this study, we did the following: First, we analyzed the business structure of NACF and its subsidiaries, and then summarized the current conditions and problems. Second, we examined similar cases in developed countries (Japan, German, the Netherlands) and evaluated the adequacy of the plan to revitalize the NACF subsidiaries. Third, we interviewed executives of the agricultural cooperatives on innovation strategies to promote self-reliance in the subsidiaries. Lastly, we proposed a plan for NACF to cope with the market's opening to agricultural products and changes in the marketing environment.

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### 5.18 A Study on the Direction of Community Raising and Management for Rural New Towns

The objective of this study is to formulate a settlement and operation program of agricultural and fishing “new towns” so that they can contribute to the regional economy by settling in local communities and create new values.

The main contents of the study are as follows: Firstly, the meaning and necessity of creating new agricultural and fishing towns and the problematic aspects of sustaining local communities were highlighted amid population changes in agricultural and fishing towns. Secondly, domestic and overseas situations were examined with respect to the communities returning to agricultural towns or the activities of social groups in local communities. Thirdly, policy support programs were studied to develop local community programs for agricultural and fishing new towns and help their stable settlement.

The suggestions obtained from the discussions of experts can be summarized as follows in four aspects: First, it is essential to develop/practice support programs by considering the diverse requirements in each step of the course returning to a rural town, so that the dwellers of agricultural and fishing new towns can smoothly settle in in local communities. Second, it is necessary to create an atmosphere and incentives for existing inhabitants of a business region to understand the project contents and positively respond and cooperate. Third, as the business of creating a new agricultural or fishing town has to perform diverse support programs in relation to residence, economic activity, integration of local community, etc., it is crucial to organize a task force at a self-governing body to perform appropriate functions. Fourth, the experts in the private sector or NGOs need to participate in the helping of adaptation after recruiting those who wish to return to a rural town, supporting both the decision to move and the actual

relocation. Fifth, the local community program that provides economic opportunities and public benefits to those returning to a rural town is very important for the successful settlement of a new agricultural or fishing town in the region.

According to the survey results and experts' opinions, it is essential to develop a policy program that will support the smooth settlement of newcomers to a new agricultural or fishing town.

The independent implementation of a complex settlement program by one department of a rural city or a county is subject to limitations. Therefore, organization of a TF team at a relevant department as a cooperative entity of the private sector is needed to exclusively push forward the project.

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### 5.19 A Study on Development of the Korea Agricultural Outlook Model, KREI-ASMO 2008

The KREI-ASMO (KREI - Agricultural Simulation Model) has been maintained and managed by the Korea Rural Economic Institute (KREI) since 1996. The database of the model has been updated and reestimated annually to project mid- and long-term outlook of the Korean agriculture under various alternative policy scenarios.

However, since the environment of the Korean agricultural industry is fast changing, the KREI-ASMO does not appropriately project possible policy options. Therefore, a new simulation model is needed to better reflect the current Korean agriculture as well as the fast changing international trade regimes such as WTO/DDA and FTAs. A modeling team was established at KREI and it developed a new dynamic simulation model called KASMO (Korea Agricultural Simulation Model) for 2 years, 2007~2008.

KASMO is divided into six sub-models according to the following six industry sectors: grains sector, vegetables sector, fruits sector, livestock sector, and overall domestic agricultural sector. The statistics database is updated every year and the model structure has been improved to facilitate KASMO. In this context, this study should be carried out continuously.

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## 5.20 A Study on Modeling and Simulation of the OECD World Agricultural Outlook Model, Aglink 2008

As an agricultural outlook model developed in 1993 by the OECD Secretariat in cooperation with member countries, the OECD-Aglink model has been used by the Secretariat for the OECD-FAO Agricultural Outlook Report and quantitative analysis of the world agricultural market. Especially since 2005, the model has continuously been refined through joint research with the FAO. It was subdivided into modules by country and region, and the scope of outlook was expanded (Aglink-Cosimo model).

The purpose of this study is twofold: first, to build the ability to use the model and conduct various applied analyses in preparation for trade negotiations; and second, to make rational agricultural policies by forecasting and analyzing the agricultural environment home and abroad.

The major contents of this year's research are as follows:

In the first chapter, we introduced the background and aims of this study and the difference between this year's and other years' studies with a review of preceding studies and a brief explanation of the Aglink 2008 model.

In the second chapter, we reviewed the current status of climate change and analyzed its effect on the world supply and demand and price of major grains based on historical data.

In the third chapter, we analyzed the possible effect of climate change on the world grains market by setting up several scenarios related to the production and its impact on the domestic livestock sector.

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## 6.1 East Asian FTA and the Agricultural Sector

East Asian countries are seeking to strengthen regional cooperation to cope with the deepening and widening regional blocs of Europe and America. There are several possible forms of regional blocs, such as free trade area (FTA), economic common market, common market, and union. Free trade area can be a basis for further economic or regional integration. In this study, the role of the agricultural sector and the impacts of free trade area are discussed and evaluated. Trade patterns, competitiveness, tariff barriers and impacts of free trade area are analyzed. The desirable roles of the agricultural sector and ways of enhancing agricultural cooperation for the progress of regional integration are proposed.

The results of a simulation by GTAP show that there will be a positive GDP growth for all member countries of an East Asian FTA. GDP growth is estimated to be 2.68% in Korea, 1.41% in Japan, 0.46% in China, and 0.76% in ASEAN. Rice export is estimated to increase by \$290 million in China and \$180 million in ASEAN, whereas rice production is expected to fall by 7.6% in Korea and 9.8% in Japan. Grain trade other than rice is expected to show small changes. China's corn export, for example, is projected to increase only by \$40 million.

Fruit trade is estimated to increase due to the East Asian FTA. However, increased trade volume would be relatively small compared to rice. China's export of apples and pears is estimated to increase by \$10 and \$6 million respectively. Banana export by ASEAN is projected to increase by \$6 million. Korea can increase fruit export by \$1 million for both apples and pears and by \$1.5 million for grapes.

China becomes the biggest beneficiary of vegetable trade from the East Asian FTA. China's export of garlic and onions will increase by \$24 million each. More than a half of China's



export is expected to be imported by Korea. The change in meat trade due to the East Asian FTA is projected to be smaller than that of vegetables. ASEAN countries can increase chicken export to Korea and Japan, and Korea and China can increase chicken and pork export to ASEAN and Japan in small amounts.

China's agricultural exports and imports are expected to increase by \$5 billion and \$3.5 billion respectively due to the East Asian FTA. ASEAN's agricultural trade surplus is expected to be even bigger than that of China. However, Korea and Japan can become the losers of the FTA. Therefore, there should be a compensation mechanism for the FTA. Without a compensation mechanism, the member countries' agricultural sector may become an obstacle to the progress of regional integration.

There will be a few difficulties establishing the economic integration including agriculture. To avoid the worst possible role that agriculture might play in the negotiations, a cooperative and positive role of agriculture is demanded, which includes reforming domestic regulations to meet global standards. As various market opening measures will cause different socio-economic problems, it is necessary to prepare for changes needed to adapt to a new trade environment. Non-tariff barriers should be eliminated, and useful information has to be shared. Also, technical standards for agricultural commodities should be drafted and existing quarantine procedures and customs, commodity standards, labeling, and other important matters should be addressed to increase the volume and value of agricultural trade within East Asia.

As the East Asian FTA promotes agricultural trade within the region and with other countries, food safety becomes a more important issue. Persuasive quarantine standards must be proposed to prevent unnecessary socio-economic losses, and continuous economic cooperation and complementary trade relations should be maintained and developed as well.

As for compensating for market openings, it is necessary to launch various economic cooperation activities for rural areas and agricultural industries within East Asia. Moreover, technical

cooperation, labor exchange, natural resource management, and investment in marketing and processing must be considered to accomplish the ultimate objective “Single Market.”

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## 6.2 A Study on the Status of Import and Marketing of North Korean Agricultural and Forest Products

The inter-Korean economic cooperation has progressed much in quantity since the 6.15 Declaration. So far, the economic cooperation has been focused on aids rather than trade, and this is natural when we consider the economic situation in North Korea. Nevertheless, there remain many issues to be resolved to further revitalize the inter-Korean economic cooperation, and especially commercial trade. Although increased commercial trade between the two Koreas is important, a system improvement is required for sustainable development of inter-Korean economic cooperation.

In regard to the task of revitalizing the inter-Korean trade, a possible short-term solution can be found in increasing the trade volume of agricultural and forest products. However, some people do not agree with this. Farm producers, in particular, worry about what impact imported products from North Korea would have on the domestic market when the import volume increases. Then the settlement of related policies and the improvement of existing system are essential to revitalize the inter-Korean trade.

This study aims to figure out the status and problems of importing, marketing, and consuming North Korean agricultural and forest products in South Korea. The contents of the report are as follows: The first chapter describes the status and importance of trade in inter-Korean agricultural and forestry cooperation. The second chapter investigates the import trend of agricultural and forest products from North Korea. The third chapter shows the current conditions for marketing and consuming the imported products in the domestic market. Finally, policy issues are raised and suggestions on solving the current problems are made.

The major issues of suggested policies are the problems

that need to be addressed through the coordination between the South and North, improvement of import system and management of North Korean agricultural and forest products, and marketing and consumption in the domestic market.

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### 6.3 A Global Japonica Rice Model and Projection

In this year, the prices of international grains have increased significantly, and rice is not an exception. Egypt, one of the major japonica rice exporters, declared an export ban to stabilize its domestic rice market. As a result, the international price of japonica rice has shown a sudden rise since April, 2008. To cope with the market condition, we need to grasp the market factors that have an influence on the supply and demand of the international japonica rice market. The objective of this study is to develop a new econometric simulation model to provide an outlook of japonica rice in terms of international price and supply/demand utilization.

The international japonica rice model is mutually connected by 3 sub-models, each of which is a function for either macro economy, supply and demand by country, or international utilization. The sub-model of supply and demand by country employed the estimation of area harvested, yield, per capita consumption, ending stock, import in exporting country, export in importing country, and farm price. In addition, other consumption is exogenized applying the increasing rate of the past 10 years. In the case of the country where a stock control policy is carried out, the intended stock quantity is adopted. An equilibrium price in each country is driven to a point where supply and demand is equal. Same as in the one-country model, the international price of japonica rice (California #1) is determined when total exports and imports are balanced.

The U.S shows a relatively high price elasticity on demand compared to other countries. Price elasticity on area harvested in Egypt is relatively high, while the rest are inelastic. Based on the analysis, the production of international japonica rice would increase to 6.4 million tons in 2019 from 5.8 million tons in 2006. The area harvested is forecasted to peak at 1.2 million ha in 2009 and then

decrease to 1.1 million ha in 2019 due to Korea and Japan. The reason why there would be higher production in spite of the reduction of area harvested is that yield is projected to increase continuously, except Taiwan.

International consumption of japonica rice would be 5.8 million tons in 2019 from 5.4 million tons in 2006 due to an increase in per capita consumption of China. Therefore, the import amount needed in importing countries would be bigger than the amount major exporting countries would be able to export. In addition, the international price of japonica rice would surge to \$1,067/ton in 2008, and stabilize at the level of \$610/ton that is much higher than the average year. However, if the possibility of extraordinary market conditions is lower, the price would be at a lower level than forecasted. In short, the export potential that might be determined by food consumption in the U.S. and China, as well as the export policy of Egypt, will influence the international price significantly in the future.

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## 6.4 A Study on the Changes of Main Production Areas of Chinese Agriculture

Agricultural trade between Korea and China has increased rapidly since they established a bilateral diplomatic relationship in 1992. As a result, China's share in the Korean agricultural import market has expanded progressively.

The purpose of this study is to analyze the situation of domestic supply and demand of some major agricultural products and trace market changes in their main production areas in China. Ultimately, this study tries to derive some policy implications from the analysis.

The major research findings from this study are as follows:

First, the core factor contributing to the changes in main production areas is the natural and geographic conditions for most products in China. As the market economy expands, however, the relative profitability has become an important variable which has significant consequences on farmers' decision making.

Second, agricultural policy is still an important factor in China. The 'Geographical Distribution Planning of Advantageous Agricultural Crops' which the Chinese government has introduced since 2003 affected the formation and change of main production areas for most agricultural products. China tried to facilitate the concentration of some agricultural products in main production areas through the boosting policies. In those areas, the agricultural industrialization models of "Leading Enterprises, Production Base and Farmers" appeared and developed qualities and competitive advantages to make agriculture an export industry.

Third, the northeast of China, especially the Heilongjiang province, is specialized as the main production area of medium and round grains of rice. Thus, it may be a potential threat to the Korean rice industry with regard to the tariffication of rice sometime in the future. Korea needs to respond strictly when it

comes to the negotiations for an FTA with China in consideration of its effects on the rice industry.

Fourth, the importance of monitoring and tracing the Chinese market has increased as Korea's import dependency ratios of corn and soybean from China are rising recently. Korea also needs to diversify its import partners other than China for the stable supply of these grains.

Fifth, Korea imports some spicy vegetables from China, most of which are produced at large vegetable-exporting bases in Shandong Province. If it is inevitable for Korea to import them from China for the stable domestic supply of spicy vegetables, it should emphasize the safety rather than the quantity of imported vegetables. That's why Korea needs to consider the possibility of opening a quarantine facility at a main production base in China to enhance the safety of imported vegetables.

Finally, Korea may benchmark China's project models for agricultural industrialization to consolidate the linkage between agriculture and food industry.

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## 6.5 2008 Agricultural Issues and Lessons in OECD

Korea has been attending the Committee for Agriculture (CoAg) and its three working parties (APM, JWP on agriculture and trade, JWP on agriculture and the environment) since becoming a member of the OECD in December, 1996. The agendas discussed at the OECD are leading the global policy issues of agriculture and could be applied to policies usefully. In Korea, however, the government and academic community have limitations in coping with the OECD discussions due to a lack of experts in the field. Thus, cooperation among the government, academic community, and research institutes is essential.

This study analyzes the issues discussed at the sessions of APM (3 times a year) and CoAg (twice a year). The KREI-OECD workshop in which 4 OECD representatives attended was held in Seoul on April 3, 2008. At the workshop, held as part of KREI's 30th anniversary, PSE, PEM, and Environmental Indicators, the models that analyze agricultural policies of each member country, were reviewed by the participants. Also, a synthesis report titled 'Agricultural Policy Design and Implementation' was presented by the OECD representatives. In other sessions, two documents were released and discussions followed to exchange views from the two different perspectives of Korea and the OECD on the 'Evaluation of Agricultural Policy Reforms in Korea.'

At the 150th OECD Committee for Agriculture (13~15 May, 2008), discussions were held on the main agendas of '2009~2010 PWB,' 'Economic Assessment of Biofuel Support Policies,' 'Agriculture and the Environment,' and the schedule of GFA. The document titled 'In-Depth Evaluation of the CoAg' reported that the committee's operations were evaluated average in the areas of relevance and efficiency and high in the area of effectiveness.

One of the main issues discussed at the following 151st CoAg (18~19 Nov., 2008) concerned the committee's administrative operations like follow-up recommendations of the in-depth evaluation of CoAg and the review of the committee's sub-structure. Decisions were also made to integrate the two commodity groups of the APM into the 'Group on Commodity Market' and determine the date of a symposium to be held on what implications globalization might have on the food market and public policy. Also, a survey was conducted on the participating delegates to the 151st committee meeting to find out about their preferences for the themes to be discussed at the 2010 ministerial meeting.

At the 45th APM (19~20 Feb., 2008), an OECD report titled "Evaluation of Agricultural Policy Reforms in Korea" was published, assessing Korea's achievement of agricultural policy reform and advising additional measures for more market-oriented agriculture. A synthesis report was also published on agricultural policy design and implementation. It described policy principles behind the successful reforming of decoupling, targeting, and farm income issues. The other agendas discussed at the meeting were "The Role of Farm Households and the Agro-Food Sector in the Economy of Rural Areas," "Risk Management in Agriculture," and "Recommendations of PSE Expert Group."

At the 46th APM (20~21, May, 2008), the OECD-FAO Agriculture Outlook 2008~2017 was presented, forecasting the supply, demand and price of grains. According to Monitoring and Evaluation, the producer support estimate (PSE) for 2007 was shown to be at 23%, the lowest level ever. Also, the delegates examined 'the interaction of public and private standards in the food chain' and 'the evaluation of agricultural policy reforms in Japan.'

At the 47th APM (13~15 Oct., 2008), the delegates pointed out that the document "The Role of Farm Households and the Agro-Food Sector in the Economy of Rural Areas: Evidence and Policy Implications" overstated the influence of technical

change. And they discussed the state of affairs related with the creation of new values and the government's role in the agro-food sector. Member countries asked the Secretariat to prepare the document in such a way that analysis results can present policy implications. In the discussion of 'coverage and measurement of water transfers in the PSE and GSSE calculations,' the delegates confirmed the principle that PSEs should be calculated based only on the actual water amount supplied to farmers. Discussions were also held about the document 'Policy Initiative Concerning Diet, Health and Nutrition,' but the delegates decided to shelve the idea of declassifying it after they reviewed the 'Risk Management in Agriculture - a Holistic Conceptual Framework.'

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## 6.6 A Study on the Impact of a Korea-Australia/New Zealand FTA on the Agricultural Sector of Korea

Korea and Australia agreed to conduct a feasibility study on an FTA between the two countries, and as a result, a joint study on the effects of an FTA was conducted recently. However, there has not been such a research with respect to the agricultural sector. Accordingly, this study aimed to analyze the impacts from such an FTA on the Korean agricultural sector.

Australia and New Zealand have been major exporters of agricultural products for decades without government subsidies. Nevertheless, they were able to gain a competitive foothold in the global agricultural market. In particular, these two countries are major competitors in the world beef and dairy markets in terms of price and quality. For decades, the major importing countries of agricultural products from Australia and New Zealand used to be mostly European countries, but the major export destinations of these two countries' products have changed to Asia such as Korea and Japan.

An econometric simulation model (KREI-ASMO 2007) was used to analyze the impacts of an FTA between Korea and Australia, or New Zealand, on the Korean agricultural sector. For the analysis, import demand functions are estimated for each of the major exporters to Korea by considering the substitute effects with each other. The import demand functions reflected the trade diversion and creation effects to the entire model. However, the processing industry was not included because of lack of data.

The baseline projection is based on the Korea-US FTA (KORUS FTA) applying only the tariff reduction schedule to the model. A scenario was developed with respect to an FTA between Korea and Australia/New Zealand (KORAUNZ FTA), which the study presumed would have the same tariff reduction schedule as the Korea-US FTA. Therefore, the difference between the results

of the baseline and the scenario is defined as the impact on the Korean agricultural sector.

The findings are 1) the total agricultural production value (TAPV) of Korea would decrease by 5.2 billion won in the first year (2009), 2) the TAPV would decrease by 17.6 billion won in 2013, and 3) it would decrease by 78.9 billion won in 2018. All in all, the 10-year-average decrease in the value would be 48.6 billion won.

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## 6.7 Concession Strategies in the Agricultural Negotiations for the Korea-China FTA

Korea and China launched a joint study for a free trade agreement in March 2007. Industry experts, government officials and academic researchers of the two countries are scheduled to present a final report of the study by the end of June 2008; and the Korea-China FTA (KCFTA) is within reach nowadays. And yet, if tariffs are eliminated as a result of the KCFTA, a series of rapidly increasing agricultural imports from China may have significant detrimental effects on the Korean agriculture because China produces agricultural products at lower costs due to its cheap and abundant labor. That is why the Korean agricultural sector should prepare measures in response to the KCFTA in the near future.

The purpose of this study is to establish some strategies for a soft landing of Korean agriculture even after the KCFTA. In order to gain reasonable results from FTA negotiations with a competitive counterpart, well-organized strategies with clear logic are indispensable.

We measured competitive advantages of Korea and China in the field of agriculture by using the MCA (market comparative advantage) indices for 690 items at the HS-6 digit level for the period from 2004 to 2006. The study results showed that China has competitive advantages in 236 items in the Korean market while Korea has only 40 competitive items in the Chinese market. Under such circumstances, Korea needs to develop the following negotiation strategies for an FTA with China:

Firstly, Korea should emphasize 'limited FTA' rather than 'comprehensive FTA.' Since it takes a considerably long time to secure a competitive advantage in agriculture and readjust the domestic agricultural structure, Korea can eliminate tariffs on only a specific range of agricultural products in the short run.

Secondly, Korea must persuade China that the Korean agriculture needs a soft landing in the long run. As a primary industry of the nation, agriculture should have the functions of producing and supplying staple foods and maintaining income opportunities for farmers. A soft landing of agriculture can only be possible when the agricultural sector retains sustainability after the KCFTA.

Finally, Korea needs to advocate a 'balance of concessions' in both the agricultural sector and the whole economy, noting that international division of labor should be reinforced in agriculture through specialization in both countries.

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## 6.8 Economic Impact Analysis for Korea-GCC FTA in the Agricultural Sector

This study has performed an economic impact analysis for the upcoming Korea-GCC FTA in the agricultural sector and proposed some negotiation strategies. The research outcomes are summarized as follows: First, agricultural trade is likely to be of little interest to the two partners considering the present state of agricultural structure and trade balance. Second, it is suggested that Korea follow a minimalist approach to making market access commitments given the nature of agricultural sensitivity within the country and relatively weak potential gains expected from both sides. Third, since increases in market access will be mostly beneficial to processed and preferential food or products, attention should be warranted in these areas during negotiations. Fourth, the rule of origin must take into account the fact that Korea exports a number of value-added food using imported ingredients. Besides, it needs to focus attention on the prevailing re-export practices by the GCC countries. Finally, securing a safeguard is important only when the resulting compensation is not beyond the reach of the government.

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## 6.9 Mid- to Long-Term Development Strategy for the College of Agriculture and Life Sciences, Kyungpook National University

The circumstances surrounding the agricultural industry have been changing rapidly recently inside and outside of the country, and there are signs of change in university policies. In response to this, the role of universities in the fields of agriculture and biotechnology needs to be settled, and this requires a quick and comprehensive action.

The College of Agriculture and Life Sciences at Kyungpook National University (CALs/KNU) has great human and material resources. However, restructuring is inevitable if it is to receive an appropriate recognition. For the specialization project of KNU and the success of “KNU 2010 GLOBAL100,” it is suggested that the College of Agriculture and Life Sciences make a long-term development plan. Accordingly, this study aims to present a vision for the future of CALs/KNU and set its basic directions and strategies for the period from 2008 to 2018. We will grasp the situation of education, research, social services, international cooperation and campus operations and suggest some active ways to deal with them.

The College of Agriculture and Life Sciences is located in the Daegu and Kyungpook area and it has a great possibility of future growth. This area is the center of agricultural industries in South Korea. Its agricultural business is higher value-added and nature-friendly, therefore it is expected to be intensively fostered as a strategic industry. Furthermore, there is the possibility that the food industry will be developed as a key industry. As university policy has been greatly changed in every aspect, we'll face big difficulties unless we gain competitiveness and we, the members of agricultural departments at KNU, know that we need to change to meet the demand of users. The key role of the College of

Agriculture and Life Sciences at KNU is to attract talents to meet the requirements of the government and community, share its experience and knowledge, and encourage students to self improve. To complete the tasks, we set the development purposes as follows:

- 1) developing human resources
- 2) building up an integrated knowledge structure and creating new knowledge
- 3) developing practical development strategies with KNU
- 4) campus operation for users

We suggest five strategies for the basic development.

Strategy 1: strengthening human resources development

- development of human resources in research and industrial field, and cultivation of future farmers
- securing graduate students to focus on research in life science
- developing programs the industry requires and create jobs
- developing field training programs, which can create potential future farmers
- offering incentives to good faculties for better competition
- developing student guidance programs
- introducing lifelong education for graduates
- specialization among campuses;

Daegu campus (developing human resource in research and industrial field)

Sangju campus (stock raising and ecological environment)

Gunwi campus (training future farmers and promoting international cooperation in agriculture)

Strategy 2: enhancing result of the study through harmony of tradition and state-of-the-art technology

- developing new knowledge and technology by incorporating high-tech life science and traditional agriculture

- developing practical technologies to meet the demand of agricultural and life-science industries
- studying agricultural science at the center of the field
- building up cooperation structure to enhance the ability and performance of research
- strengthening industrial studies in conjunction with food-related businesses, such as nutrition, sanitation, manufacturing, storing and distribution
- building up a cooperative education system for local agriculture
- increasing article submissions to journals, such as SCI/SSCI and giving more financial support
- offering researchers with more finances and incentives
- establishing a support system for more effective ways to deal with a large amount of knowledge and information

Strategy 3: government-industry-academic cooperation and internationalization

- building up a support system for agricultural industries by the central and the local government
- exchange programs among universities and research institutions home and abroad
- supporting lifelong education for farmers
- strengthening cooperation with industries and developing training programs
- building up exchange programs for foreign professors and students
- offering chances to study abroad for officials in developing countries and training more potential farmers

Strategy 4: effective campus operation and securing more financial resources

- introducing the president-responsibility system for being effective
- securing finance for being ready to be incorporated

- introducing a work management system for employees and building up an incentive system
- improving the evaluation standard and quality of professors' research
- improving the ability of research assistants and motivating them
- effectively operating institutes in the university

Strategy 5: expanding and improving the facilities and promoting the welfare system

- building more facilities and making more space for education and research
- strengthening HW and SW to become a more information-oriented society
- promoting the welfare system for both school workers and students
- giving more opportunities of receiving a student scholarship

There are six practical assignments to support the development strategies.

Assignment 1: developing education and human resources

- performing its duties as the school of agricultural science
- operating two programs for developing industrial human resources and future farmers
- strengthening the training program of developing industrial human resources and connecting it with the fostering of potential farmers
- operating an industrial human resources program and focusing on life science, food industries and agricultural districts
- operating the school, focusing on the three departments of applied life science, agricultural human resources development, and agricultural district development.

Assignment 2: enhancing the performance of research

- developing the science of agriculture in cooperation with the central government, the local government, and public research institutes
- strengthening the cooperation system between life science research and work-related businesses to meet industry needs
- strengthening the research of life science through financial assistance
- setting up scholarship programs to attract graduate and foreign students with academic merit
- offering incentives to performers of excellence

Assignment 3: international cooperation and social service

- building the space for life-science business and playing an important role at KNU
- strengthening of financial support for farming by local governments and operating future farmer fostering program
- cooperation with local universities and taking partial charge of the work
- building a network and strengthening cooperation with local industries
- attracting agricultural venture industries by building bio-venture towns
- offering chances to study abroad for officials in developing countries and participating in international agricultural development programs

Assignment 4: effective campus operation and securing finances

- strengthening the president's authority of evaluating university institutes, departments, faculties, employees, and introducing a responsible operation system
- being ready for incorporation by operating effectively and securing finance
- reorganizing evaluation procedures and a work management system and introducing a compensation system

Assignment 5: building more facilities and improving welfare

- making full use of facilities by specializing university and campus
- improving the welfare of students and employees and granting more scholarships

Assignment 6: establishing an intensive evaluation system to achieve goals

- precise and rigid evaluation is required for practicing the development strategy
- building an evaluation plan - approving the plan - annual evaluation - revising the evaluation measures - evaluating according to stages (annual/mid-term/final)
- conducting total and sample evaluation
- introducing various ways of evaluation, such as internal evaluation, self-evaluation, and users' evaluation
- making a specific manual that includes objectives, contents, ways of evaluation, etc.

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## 6.10 Some Issues and Directions of Korea-China FTA Negotiations in the Agricultural Sector

The purpose of this study is to analyze the research results of a joint study on an FTA between Korea and China and discuss potential issues that may arise from the FTA in the agricultural sector. Also, the study derives policy implications for future negotiations for the Korea and China FTA.

Some findings of this study are as follows:

First, this study reviewed the three issues of 'rules of origin' (ROO), 'sanitary and phyto-sanitary' (SPS), and 'special safeguard' (SG). There is some possibility for China to raise the 'regionalization' issue in the ROO discussion. In the negotiations on 'special safeguard,' Korea needs to propose the establishment of separate SG measures for agriculture.

Second, this study reviewed the prospect of intra-industry trade in the agricultural sector and the grain export restraints of China. It may be very difficult for Korea and China to have substantial intra-industry trade since horizontal as well as vertical division of labor may be possible only to a restricted extent. This is why Korea should demand exceptionally flexible treatments for some highly sensitive agricultural products.

Third, in consideration of an FTA with China, Korea should consider and maintain consistency in selecting sensitive items during the DDA negotiations. Since the DDA has already agreed to allow Special Products (SP) for developing member countries, Korea, as a developing member, needs to ask for the special treatment of sensitive items in the FTA.

Fourth, after the FTA, Korea may expand its agricultural exports to China through enhanced human networks in China. It also needs to introduce image marketing targeted at high-income Chinese customers. A niche market strategy may be useful to expand the sales of high-quality and high-price goods.

Finally, Korea should improve its quarantine system for Chinese agricultural products. Since Korean customers' interest and concerns on food safety and quality have been elevated, both countries need to cooperate and raise the sanitary level of foods and agricultural products produced in China.

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## 6.11 The Potential Impacts of the Doha Agricultural Negotiations on Korea

This research addresses the issues of market access, domestic support and export competition within the Falconer's revised draft text for agriculture and analyzes their potential economic impacts on the agricultural sector in Korea. The proposed tariff cut formula coupled with the assumed treatment of sensitive and special products would bring about a reduction in bound tariff up to 44 percent.

A static analysis shows losses in agricultural production in monetary terms because of increased imports. Ginseng production would fall by 18 percent followed by garlic (16 percent) and chickens (14 percent). The provision for special and differential treatment contributes to relatively low production contractions of sensitive products such as meat, pepper, barley and Korean citrus.

Among the proposed guidelines for domestic support, product-specific AMS ceilings and Blue Box limits are of great concern, because they might influence the direction of rice support policies in the future. To ensure sufficient room for a switch from AMS to Blue Box, it is recommended to use the base period 1995~2000 in AMS calculations and take advantage of the transfer mechanism between the two.

When preparing its country schedule, the government must estimate quota equivalents of tariff reduction and compare them with quota concession for sensitive products. This is because the treatment of sensitive products may not be always far superior to normal cuts.

It is pivotal for the country to maintain the developing country status with which Korea may be able to take soft landing or achieve gradual policy reforms. In this regard, an important question is whether the country is ready and is in a position to accept greater responsibilities in policy reforms.

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## 6.12 The Effects of Food Aid to North Korea and Policy Issues

South Korea has recently provided a massive amount of food aid to North Korea, and this is expected to continue in the future. Most people recognize the need to provide food assistance to North Korea for humanitarian purposes, however, support form should be changed. It is necessary to diversify and improve the support form to North Korea to enhance the impacts of food aid.

This study was conducted as follows: First, we analyzed the impacts of food aid to effectively supply food to North Korea. Second, we reviewed the food aid system of advanced donating countries and suggested policy tasks that can be considered at the current stage.

This study aims to provide basic policy directions that can contribute to establishing effective food aid policies in the future based on the assumption that food aid to North Korea will be continued for humanitarian purposes. For these purposes, the main aims of this study are drawn as follows:

First, it is to investigate the current situations of the supply and demand of food in North Korea and South Korea's food support to North Korea. Second, it is to analyze the effect of food support to North Korea on the grain market in South Korea. Third, it is to investigate the food aid systems of the international community, and specially the U.S., to review the possibility of applying the system in the process of South Korea's food aid to North Korea. Lastly, it is to review the direction of food aid program to North Korea and recommend related policies.

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### 6.13 Policy Issues on Revitalizing Inter-Korean Economic Cooperation in Agriculture and Fisheries

This study aims to figure out the problems of inter-Korean economic cooperation and suggest strategies for revitalizing it. In doing so, the government's role is more emphasized because there are more important issues to be considered, such as establishment of related policies, system adjustment and creation of cooperative foundation and circumstances.

Since the June 15 Declaration, the relationship between South and North Korea has grown close and the inter-Korean economic cooperation has progressed much in both quantity and quality. The inter-Korean economic cooperation in agriculture and fisheries sectors had many difficulties in earlier years, but it has settled in since the mid-2000s. So far, 21 cooperation plans have been approved in agricultural and fisheries sectors. Of these, four are canceled and the rest are valid for now.

South and North Korea have already agreed to cooperate in a host of business areas in agricultural and fisheries sectors. They decided to cooperate in various business projects during their first meeting of the Inter-Korean Agricultural Cooperation Committee in 2005. At the 2007 Inter-Korean summit meeting, the two sides also agreed on future cooperation, but so far such plans have not made much progress and the future is not clear.

The South and the North announced the Four Agreements on Inter-Korean Economic Cooperation as the only way to make economic cooperation between them stable and the agreements have become officially effective on August 18, 2003. But since there is no detailed guiding principle, the agreements' performance has been very limited. To revitalize the economic cooperation, the contents of the four agreements should be more concrete and the economic environment of North Korea should be changed. The

Investment Law for Foreigners, which is applied only to foreign countries, also needs to be applied to the South equally. The relationship between the two Koreas must be fundamentally stable and to achieve this, consistency of policy is required.

We should be ready to carry out any concrete plans first in case the relationship between the two Koreas improves and if private enterprises lead the economic cooperation, it would be accorded with the government policy, which has been carried out for mutually-beneficial inter-Korean relationship.

Business projects under unfavorable environment should be carried out first in a coordinated manner before gradually moving on to investment projects or contract productions. The supportive work, which is led by the central government or non-government organizations (NGOs), should be focused on the guiding role of making North Korea turn its eyes to reform and open-door policy for the future.

We should make the policy on the North with a long-term view, and to revitalize economic cooperation in agriculture and fisheries, it should be carried out consistently and continuously. The inter-Korean economic cooperation should be settled in for permanent peace of the Korean peninsula and mutually beneficial inter-Korean relationship. Also, there should be a system that can check out products' country of original because they are produced with materials from the North. The economic cooperation could be successful when a safety system is ready.

It is also important to make the international environment favorable. The North Korean nuclear issue is deeply related with inter-Korean cooperation, therefore, the participants of six-party meeting will have to show their efforts to revitalize the South and North Korean economic cooperation. From now on, it should be the priority of the North to join international financial institutions, and it should become a member of the international society for securing financial resources. Recently, South Korea's government made the Fund for Development of North Korea at IBRD and it will be a good example to support the economic development of

the North.

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## 6.14 The Effects of Korea-EU FTA on Korean Agriculture and Export Promotion

The ongoing negotiations for the Korea-EU Free Trade Agreement (FTA) are expected to reach a conclusion some time in early 2009. This study focused on the effects of the Korea-EU FTA on Korean agriculture, examining the recent results of the negotiation which is close to its final stage. Korea exports about \$50 million of agricultural products including processed foods to the EU. On the other hand, Korea imports about \$2 billion of agricultural products from the EU. Therefore, Korea can expect to see a potential loss from the Korea-EU FTA in agriculture.

Sensitive products of the Korea-EU FTA include meat (except beef), and dairy products, tomatoes, grapes and kiwi fruits. An impact analysis was done mainly for those products. Increased imports of EU's agricultural products are estimated to reduce Korea's agricultural output by 245 billion to 260 billion won. It is far below the case of Korea-US FTA effects on Korean agriculture. The pork industry would be the biggest loser from the Korea-EU FTA and the value of production is estimated to be reduced by 188 billion won. The dairy and chicken industries' outputs are estimated to be reduced by 78 billion won and 13 billion won respectively. As for the horticultural sector, the production of kiwi fruits and grapes is projected to be reduced by 3 billion won and 4 billion won respectively. The tomato industry can be affected negatively from the Korea-EU negotiation by 7 billion won.

Korea is evaluated to maintain and strengthen competitive edge against the EU in some agricultural products such as fruits, cigarettes and drinking beverages. Export promotion effects of the Korea-EU FTA on the Korean agricultural sector are expected to be restrictive. Major Korean commodities exported to the EU can be exported more because of the negotiation. Fifteen major export

items exported to the EU account for 78 percent of total export and the export is estimated to increase by a maximum of \$50 million. When we evaluate export promotion effects from the recent exports data, exports can be increased by \$7 million.

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## 6.15 KREI Quarterly Report on Agricultural Trends in North Korea

The purpose of this research is to provide an analysis of agricultural trends in North Korea and help policy makers and experts concerned with North Korean issues. The KREI Quarterly Report on Agricultural Trends in North Korea is issued quarterly and is comprised of four sections: “Focus,” “Analysis on Agricultural Trends,” “Trends of Trade and Cooperation in Agriculture,” and “Agricultural Data.”

“Focus” has four articles: “the trend of international grain market and food situation in North Korea,” “status of inter-Korean agricultural cooperation in regional governance and future issues,” “agricultural development cooperation between two Koreas and policy issues,” and “2009 outlook of food supply and demand in North Korea.”

The agricultural trends in North Korea in 2008 were similar to the previous year. The basic goal was to increase food production through the production of qualified seeds, increase of potato production, expansion of double cropping area, and small animal raising. In agricultural infrastructure, North Korea put emphasis on the construction of “gravity irrigation canals.” The Mirubul irrigation canal construction continued in 2008. In the agricultural production sector, farmland was allocated more for potatoes and soybeans, and the cultivated land of grains was stable. In the livestock sector, the North concentrated efforts to increase the production of small animals such as rabbit, goat, and poultry. As for agricultural management, it devoted to improve the supply of agricultural labor power, machinery, and manuals.

The government’s assistance of grains and fertilizer to the North was halted. However, South Korea resumed to provide 400,000 tons of rice under a concession basis in 2007, which was halted in 2006. And 300,000-350,000 tons of fertilizer have been

delivered to the North since 1999. The inter-Korean trade volume in agriculture, forestry, and fisheries in 2008 was similar to 2007.

International assistance to the North decreased except the United States' aid because of nuclear issues.

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Report No: E02-2008-01 ~ 04/Dec. 2008

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## 6.16 Agricultural Trends in China

「Agricultural Trends in China」 will be comprised of five chapters: agricultural policy brief, agricultural and rural economic trends, issues of agricultural policy research, policy data, and statistics of Chinese agriculture. Firstly, the agricultural policy brief will analyze pending issues of Chinese agricultural policy. Secondly, the agricultural and rural economic trends will analyze the trends of Chinese agricultural and rural economy on the basis of statistical data from the Chinese National Bureau of Statistics on such matters as production, distribution, price, consumption, and trade. Thirdly, the issues of agricultural policy research will introduce research trends at agricultural policy research institutes in China. Fourthly, the policy data will furnish translated versions of Chinese agricultural laws, administrative regulations, and rules of the central and provincial governments. Lastly, the chapter on statistics of Chinese agriculture will provide national and local government's statistical data related to Chinese agricultural and rural statistics.

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DIVISION OF FOREST POLICY  
RESEARCH

7



## 7.1 A Study of Modeling Supply-Demand System and Outlook of Korean Timber

This study is designed to provide meaningful information on optimal utilization and sustainable management of Korean forest for forest planning of the government. The research topic is based on the critical mind that the current management system could not keep the efficient cycles of resource.

Two markets of products and raw materials are analyzed for the model. They are linked by the relationship of supply and demand. Since wood products are not utilized at the final stage of the consumption, we estimate derived demand functions from profit maximization problems. Simultaneous system provides an equilibrium for each product. The volume of products demand is converted into a volume of log demand by applying conversion factors. Import volume is assumed to be decided by subtracting domestic supply from the total demand.

The amount of suppliable domestic log is estimated by Cohort age class analyses of forest area. The result shows that there would be enough stock of the final age class for domestic supply until 2050. If we manage the forest more efficiently and develop more productive species, only 20% of the final age class volume will be needed for the expected total demand of 2050.

There are some problems that decrease the reliability of the model. They should be complemented continuously even after this study. The originally designed optimal rotation period of forest for sustainable management also presents a very significant challenge in enhancing the quality of this research.

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Report No: R573/Nov. 2008

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## 7.2 A Study of Strategies to Improve the Compensation System for Developing Forested Area

This study aims to find out the problems of Compensation System for Developing Forested Area, which is used to recover diverted forest, and suggest plans that can reform the system. At present, this system is classified into the 'User's Payment.' So it cannot be used broadly and effectively. Because of this, we have to provide a right direction of forest policy.

Recently, the value of forest has grown as global warming has spread all over the world. Also, since the Climatic Change Convention is signed, the government has to manage the forest forcefully and keep up with the compensation system because the system aims to recover diverted forest. And not only that, we have to promote it more extensively.

Forest has a special and important role. As global warming spreads across the globe, the value of forest and the people's recognition of forest values has grown steadily. Because of this, the Compensation System for Developing Forested Area has to be operated more widely and aggressively.

The study proposed the following as policy alternatives for improving the Compensation System for Developing Forested Area: 1) change the name of the system, 2) raise the levy cost, 3) lower the reduction rate, and 4) efficiently manage financial resources.

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### 7.3 A Study of Industrialization and Usage of Forest Biomass

The aim of this study is to find out ways to industrialize the use of pellets, the most economical and environment-friendly resource among renewable resources.

If 200,000ha of forest are managed annually and by-products are collected as biomass solid fuels, 273,684 tons of fossil fuels can be saved annually, having the effects of replacing imported fossil fuels to the amount of 441.8 billion won and creating 20,000 jobs. In addition, 990 thousand tons of carbon emissions can be reduced.

The financial rate of returns for pellet production can be over 10% in case biomass collection costs are reduced to the 70% of total cost, while the economic rate of returns is over 30% on the same condition.

Therefore, the economic feasibility for pellet production facilities with the cost reduction of collecting forest biomass is quite high.

To reduce the collection cost of forest biomass, projects such as intensive construction of forest roads, mechanizing forest practices, and establishing a biomass collecting system should be launched.

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## 7.4 A Study on Improving Competitiveness in Forest Industry

The purpose of this study is to take a look at the problems of forest households and managers and suggest proper directions for making the forest industry stable and more competitive. The study consists of two parts, forest households (or managers) and the loaning system. The main contents of the first part deal with the following issues: how to classify various forest households (or managers), what their needs are, and how to support them. The main contents of the second part deal with what the problems of the loaning systems are, what the households' needs are, how the loan system is different from others, and how to improve the system for clients. The results of the study can be summarized as follows:

1) A study on promoting forest households and managers.

This report suggests the classification of forest households (or managers) into the basic type and the latency type to support differentiating policies and revitalize private forest management regardless of possession or nonpossession of forest land. Based on the research results, we categorized real policy targets into four types (full-time forestry households, part-time forestry households, forest management corporations, and management agencies). Full-time forestry households need policies which support the achievement of an economy of scale. Part-time forest households need policies which support the maintenance of present earnings. Forest management corporation needs policies which support the organization and operation of forest union corporations such as farming union corporations. Management agency needs policies which support their management of forest land without owners and small mountains with owners. At the end, this report proposes to enforce Forest Households Registration System, Direct Payment

Measures in forest sector, and Proposal Intensive Management System, and it also proposes the revision of Agriculture Business Guideline.

2) A study on improving the management of Forest Complex Fund.

The Forest Complex Fund, which is much smaller than the Agriculture Complex Fund, was about 47.5 billions in 2008. In view of the fund management conditions and the organization and vulnerability of the forest industry including foresters, the fund needs to improve management efficiency. The Agency's portion of the Forest Complex Fund accounts for 42% of the total, and its availability is low compared to the agriculture fund, of which the Agency's portion of the total is 87%. The expansion of institution loans through mutual loans is a very effective method, as it not only expands financial support but also induces an agency to have an autonomous responsibility system. So, it is necessary that these institution loans must be expanded from now on. Moreover, as the survey results show, we propose the adoption of following measures: reinforce the selection processes, adjust the ratio of government subsidies and loans, expand the liquidity of the fund, and focus on fund users. Also, this report recommend that we improve the current evaluation criteria by using post evaluation models based on the concept of BSC (balanced score card).

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## 7.5 A Study of Devising Schemes for FTA Negotiations on Forestry Sectors: New Zealand, Russia, Australia, and the GCC

This study is mainly designed to suggest directions and strategies for the forest products free trade negotiations between Korea and New Zealand, Russia, Australia, and the GCC. The purpose of the study is to seek ways to both minimize negative impacts and maximize positive impacts expected by the results of the agreements. The suggestions are based on the appraisal of the impacts when tariff barriers are removed or reduced, and the impacts are measured through the static analysis of equilibrium and the analysis of competitiveness.

The contents include recent trends of forest products trade between countries, current industry and market conditions of main products, structural comparison of tariff systems, and appraisals of FTA impacts.

For the accurate estimation of the competitiveness of the import market, various indices are measured. The import market shares, relative unit price, market's comparative advantage and the revealed comparative advantage index are calculated to find main products to be taken care of seriously if the negotiation reaches an agreement for each country. Production values and coefficients of import price in supply functions are estimated to measure the decrease in the production value of important items.

It is expected that the imports of wood products (fiberboard of wood  $0.5\sim 0.8\text{g/cm}^3$ ), particle board (other), shaped wood (coniferous) of New Zealand, sawnwood (coniferous), shaped wood (coniferous) of Russia, and Australian wood in chip or particles (non-coniferous) would increase if the tariffs are removed. But the increments of imports from the GCC would hardly be noticeable since its share of the Korean import market is little in terms of total import value.

For the negotiation strategies with New Zealand, Russia, and Australia, it is necessary to delay the market opening of main wood products such as plywood, sawnwood, and particle board as much as possible. This is because these industries utilize domestic resources and wood wastes, and play important roles in the sustainable forest management plan. The market for non-timber products could be opened immediately, and it is also necessary to maintain the import of raw materials such as log. As for the GCC, Korea needs to expand the market for wood products because of its growing construction industry, which requires many wood products for inputs.

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## 7.6 Monitoring Financial Performances of Major Forest Projects

We recognize the importance of various functions of forest: purifying air, reserving water, and providing recreational opportunities. The Korea Forest Service recognizes these demands and responds by way of launching major forest projects.

The purpose of this study is ultimately to promote sustainable forest management by way of verifying the problems of forest projects and providing desirable solutions for the major forest projects.

The monitoring project consists of five major fiscal projects: Ecological Forest Establishment, Forest Fire Aviation Control, Erosion Control, Forest Roads Construction, and Pest and Disease Control.

Though several problems in each project are revealed, the monitoring results show that each project generally performs well. Most of the revealed problems are being fixed by way of feedback. Policy implications and future proposals for enhancing the performance of the projects are also proposed.

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## 7.7 Monitoring Financial Performances of Forest Crop Production System Establishment Project

The purpose of this study is to promote sustainable forest management by way of monitoring the Korean Forest Service's project to establish forest crop production systems.

The monitoring process consists of three phases; policy performance ability, project performance spot inspection, and survey of policy recipients.

Though several problems of the project are revealed, the monitoring results show that the project generally performs well. Most of the revealed problems are being fixed by way of feedback. Policy implications and future proposals for enhancing the project's performance are also proposed.

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## 7.8 Monthly Outlook for Chestnut

The purpose of the monthly outlook for chestnut is to help forest households improve their farm planning and marketing strategies through timely provision of information on the supply and demand trends, price trends, and short-term forecasts of chestnut, the price of which is usually unstable. This information is also crucial to the central and regional governments when they set up plans for stabilizing the chestnut market.

The monthly outlook for chestnut is based on a survey of forest households selected as samples and monitoring personnel in main production districts. The major contents include intended and actual planted acreage, growth status and yield, estimated production, price trend and forecast, import and export amounts, and a meteorological forecast.

The chestnut monthly outlook is published on the fifteenth day of the month, seven times a year, and is distributed to forest households and related organizations, such as forestry cooperatives, agricultural cooperatives, chestnut cultivation cooperatives, agricultural technology centers, and local governments. The monthly outlook is also found on the Internet at the websites of the Korea Rural Economic Institute (KREI) and the Korea Forest Service (KFS), and newspapers.

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## 7.9 Monthly Outlook for Oak Mushroom

The purpose of the monthly outlook for oak mushroom is to help forest households improve their farm planning and marketing strategies through the timely provision of information on demand, supply and price. This outlook is also crucial to the central and local governments when they establish plans for fostering the industry.

The monthly outlook for oak mushroom is based on a survey of sample forest households and monitoring personnel in main production districts. The major contents include intended and actual planted acreage, growth status and yield, estimated production, price trend and forecast, import and export amounts, and a meteorological forecast.

The monthly outlook is published on the fifteenth day of the month, eight times a year, and is distributed to forest households and related organizations such as oak mushroom cultivation cooperatives, forestry cooperatives, agricultural cooperatives, agricultural technology centers, and local governments. The monthly outlook is also found on the Internet, at the websites of the Korea Rural Economic Institute (KREI) and the Korea Forest Service (KFS), and newspapers.

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## 7.10 Monthly Outlook for Jujubes and Astringent Persimmons

The purpose of the monthly outlook for Jujubes and Astringent Persimmons is to help forest households improve their farm planning and marketing strategies through the timely provision of information on supply and demand trends and price trends. The outlook information is crucial to the central and local governments when they establish plans for fostering the industry.

The monthly outlook is based on a survey of sample forest households and monitoring personnel in main production districts. The major contents include intended and actual planted acreage, growth status and yield, estimated production, price trend and forecast, import and export amounts, and a meteorological forecast.

The monthly outlook is published on the fifteenth day of the month, five times a year, and is distributed to forest households and related organizations such as forestry cooperatives, agricultural cooperatives, agricultural technology centers, and local governments. The monthly outlook is also found on the Internet, at the websites of the Korea Rural Economic Institute (KREI) and the Korea Forest Service (KFS), and newspapers.

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DIVISION OF AGRICULTURAL  
POLICY RESEARCH

8



## 8.1 World Agriculture Online Reports

The world agricultural policy and trade are wielding an increasing influence on the domestic agriculture. Accordingly, it is important to have useful information on agriculture and policies of foreign countries.

This study aims to provide farmers, entrepreneurs, researchers and organizations with information on agriculture and farm policies of foreign countries. It is expected to be used for agricultural policy making, identifying the world's agricultural trends, and setting up of trade negotiation strategies to increase agricultural export and improve farm management.

The collected information provided through the 'World Agriculture Online Reports' section of the KREI website in 2008 are as follows: 401 briefings on world agriculture; 167 abstracts of agriculture-related reports published by Korean institutes (KREI excluded), international organizations, and other countries; and 115 KREI world agriculture reports introducing and analyzing the agriculture and policies of foreign countries. The information was provided by KREI researchers and is also accessible through World Agriculture, a monthly publication (about 140 pages long), of which about 780 copies were printed each month last year.

The website section of 'World Agriculture Online Reports' was renovated several times last year with a new search engine and re-classification of information for expanded information sharing among policy makers, researchers, Internet searchers, translators, writers, and others at home and abroad.

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