A Study on the Presence of the Information Management Division and its Effect on the Digital Divide among Different Regions of Korea

Woo-seok Park, Cheul Rhee

Abstract With the confirmation of the Free Trade Agreement (FTA) and as cheap foreign agricultural products are beginning to be freely distributed in Korea, the government has taken a greater interest in securing the competitiveness of domestic agriculture. Accordingly, the Korean government has presented plans to advance the interests of 'small but strong farmers' and secure their competitiveness in line with the agricultural conditions in Korea. The government also announced that it will focus on leading these efforts in rural areas. The main thrust of this plan to support 'small but strong farmers' focuses onutilizing advanced peripheral technologies such as IT and BT; however, there are only a few Information Management Division centers currentlyoperating across the nation, and these are mainly in the IT-related divisions of the Agricultural Research and Extension Services and Agricultural Technology Centers. Therefore, in this study, we used the responses from a survey of farmers to identify regional differences in informatization levels and the digital divide among 'small but strong farmers' according to the presence or absence of an Information Management Division center. As a result, we found that the 'small but strong farmers' in regions with an active Information Management Division center received more IT services and had a higher level of informatization. Thus, to increase the use of IT-related peripheral technology by these 'small but strong farmers', it is important to maintain or increase the number of Information Management Division centers.

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1 Introduction

The size of farms in the rural regions of Korea, in which small farms occupying less than 1 ha account for 76.7% of the overall agricultural operations, is very small when compared with those of other countries (Rural Development Administration, Extension Planning Division, 2011). Given these size limitations, the most effective strategy to ensure competitiveness in the Korean agricultural sector is to strengthen the competitiveness of our agricultural technologies (Sang-dae Lee &Kwon-jeep Kim, 2011). Therefore, the Rural Development Administration announced the 'small but strong farmer' development program to improve the capabilities of Korean agricultural operations with size limitations and produced a plan to support the development of 100,000 'small but strong farmers' by the year 2015. The essential content of this 'small but strong farmer' development is to make farmers capable of utilizing information technology effectively in farming and agricultural management so that they have access to knowledge that is relevant to the solutions to various agricultural problems. Although Information Management Divisions perform the most essential role in expanding the informatization abilities of these farmers, there are currently only approximately 15% of the original Information Management Division centers remaining nationwide; the number of these centers has gradually decreased as they have been closed or integrated into provincial Agricultural Research and Extension Services or city and county Agricultural Technology Centers. Therefore, in this study, we compare and analyze regional informatization levels from multiple angles to evaluate possible differences in the performance of informatization support for local farmers in relation to the presence or absence of an

Information Management Division center in the area, and in this context, we demonstrate a need for the presence of an Information Management Division.

2 Definition of Terms and the Evaluating Indicators

2.1 Information Management Divisions and the 'Small But Strong Farmer'

Information Management Divisions, which specialize in the development of informatization and IT skills for farmers, consist of departments internal to either provincial Agricultural Research and Extension Services or city and county Agricultural Technology Centers, which are agencies founded by local governments to disseminate agricultural technology and information.

'Small but strong farmer' is a term that combines 'small farmer', representing the characteristic of Korean farms as small in comparison with the sizes of farms in rival countries, and 'strong farmer', which implies small-scale agricultural operations that continuously achieve their management goals by using innovative capabilities such as creating value for customers and securing a customer base (Rural Development Administration, Extension Planning Division, 2011).

2.2 Performance Evaluation and Comparison

To compare the performance of various informatization support methods, first, we must determine whether a digital divide exists between two regions. A digital divide is defined herein as a difference in information competence that impacts socioeconomic activities between the classes and refers not only to differences in the opportunity and the means to access information but also to differences in the ability to use the obtained information and generate useful information (Mi-ok Shim &Hwa-nim Kim, 2001). In this study, we compared the digital divide between two regions, excluding the components related to the opportunity and the means to access information, which are outside the scope of this work.

2.3 Evaluating Indicators for the Informatization Level of the 'Small But Strong Farmer'

The conceptual framework for developing a questionnaire to evaluate the informatization levels of 'small but strong farmers' considered four major aspects. First, to evaluate business performance and the extent of its improvement due to the informatization project, we utilized the measurement factors and the key measurement indicators of Kaplan and Norton's (2001) business performance and the balances scorecards (BSCs) for the financial perspective, the customer perspective, the internal process, and the learning and growth process.

Table 1 Measurement Tool for Support Performance:Informatization Level.

Classification	BSC Perspectives	Key Measurement Factors	Key Measurement Indicators	Tool (References)
Support Performance: Informatization Level	Learning & Growth Process	InformatizationTraining	Level of Informatization Training	BSC (Balanced scorecard) Measurement Tool
			Utilization of Training Information	
			Satisfaction	
	Internal Process	Utilization of Information	Production Efficiency	
			Production Quantity	
		Distribution	Distribution Efficiency	
			Inventory Level	
			Order Fulfillment Rate	
	Customer	Customer Care	New Customers	
			Management of Customer Relations	
		Advertising and Other Effects	Transaction Volume	
			Product Promotion	
	Financial	Business Management	Asset Management	
			Return on Investment	

Second, the measurement indicators previously used by Byoung-ho Jun, Pil-koo Han, and Byung- goo Kang (2006) to evaluate the performance of informatization support were reorganized to fit the characteristics of this study; these measures consisted of e-commerce-related benchmarks and indicators such as the detailed factors for measurement.

Table 2 Measurement Tools forSupport Performance: Application of Informatization.

Classification	Key Measurement Factors	Key Measurement Indicators	Tool (References)
Support Performance Application of Informatization	E-Commerce	Use of E-Commerce	Massetti&Zmud, 1996; Mcgowan&Madey, 1998; Suk-in Lee, 1998; Gwang-ho Jun, 2002; Ki-bong Lee, 2002; Jae-wookIm, 2003
		Method of Using E-Commerce	
		E-Commerce Transaction Volume	
		E-Commerce Sales	

Third, as a measurement of IT support satisfaction related to the provision of IT services, the measurement indicators used in the study by Jung-hyeon Yoon (2007) and the factors and indicators related to activities intended to provide information, ensure its reliability, and maintain information systems were selected as the detailed factors used to identify the characteristics of the farmers and user satisfaction with the support provided by the Information Management Division.

Table 3 Measurement Tools for IT Support Satisfaction.

Classification	Key Measurement Factors	Key Measurement Indicators	Tool (References)
IT Support Satisfaction	Activities to Provide Information	Relevancy of Information	Delone& Mclean, 1992; Mirami&King, 1994
		Accuracy of Information	
		Reliability of Information	
	Activities to Provide Information Reliability	Service Performance of the Support Personnel	Parasuraman, Zeithaml& Berry, 1988
	Activities to Provide System Maintenance	IT Infrastructure Support	Karahanna& Straub, 1999; Thong, Hong & Tam, 2000

Fourth, based on interviews with the staff at the Knowledge & Information Office of the Rural Development Administration, we organized the contents of the ‘small but strong farmer’ interviews related to the various aspects of providing information services.

Table 4 Measurement Tool for Aspects of Information Services Provision.

Classification	Key Measurement Factors	Key Measurement Indicators	Measurement Method
Aspect of Providing Information Services	InformatizationTraining	Highly Applicable Educational Content	Interview
		Most Helpful Training	
		Lectures by External Instructors	

Aspect of Providing Information Services	Utilization of Information	Major Areas of Application	Interview
		Difficulties in Utilizing Information	
	Customer Care and E-Commerce	Blog or Social Networking Service (SNS) Use	
	Direction of Future Development	Expected Components of Informatization	
		Measures to Improve the Quality of Information	
		Most Appropriate Institution for Training	
		Expectations	
		Information Service with Smart Phones	

3 Research Methodology

The detailed items in the questionnaire distributed to the 'small but strong farmers' were based on the above four types of conceptualframeworks for the evaluation of theinformatization level, and through interviews with the farmers and researchers at the Knowledge & Information Office of the Rural Development Administration, we derivednew items that were customized for the current study.

This study enrolled 67 subjects based on the recommendations of the Rural Development Administration for 30 'small but strong farmers' in regions with an Information Management Division center and 37 'small but strong farmers' in regions without an Information Management Division. The study results are based on the responses of 57 farmers because 10 farmers declined to respond. There were 27 respondents from regions with an Information Management Division, which is the independent variable in this study, and 30 respondents come from regions without an Information Management Division. The demographic characteristics of the respondents are listed in Table 5.

Table 5 Demographic Characteristics of the Respondents.

Item	Classification	'Small But Strong Farmers' in Regions WITH an Information Management Division		'Small But Strong Farmers' in Regions WITHOUT an Information Management Division	
		Frequency	Percentage (%)	Frequency	Percentage (%)
Age of the Owner	30–39 years old	4	15	0	0
	40–49 years old	10	37	14	47
	50–59 years old	10	37	8	27
	Over 60 years old	3	11	5	17
Agricultural Experience	1–9 years	7	26	6	20
	10–19 years	8	30	11	37
	20–29 years	8	30	4	13
	Over 30 years	3	11	6	20
Cultivation Area	Under 1000(sqm)	6	22	6	21
	1000-2000(sqm)	6	22	14	48
	2000-3000(sqm)	2	7	6	21
	Over 3000(sqm)	12	44	3	10

4 Comparison of Informatization Levels for Each Diagnostic Area

4.1 Information Utilization

In the area of information utilization, there were differences in the degree of information utilization and the use of SNS and in the degree of the helpfulness of information training between the 'small but strong farmers' in regions with an Information Management Division and the 'small but strong farmers' in regions without an Information Management Division.

Table 6 Differences in Information Utilization.

Information Utilization		'Small But Strong Farmers' in Regions WITH an Information Management Division	'Small But Strong Farmers' in Regions WITHOUT an Information Management Division
Degree of Information Utilization		High	Average
Use of (SNS)	Blog	100%	93%
	Twitter	63%	60%
	Facebook	67%	47%
Problems in Information Utilization		Difficulties in investing time in informatization training	
Main Help Center		City or County Agricultural Technology Centers	
Contribution of City or County's Agricultural Technology Centers to Improving the Level of Information Utilization		Very high	

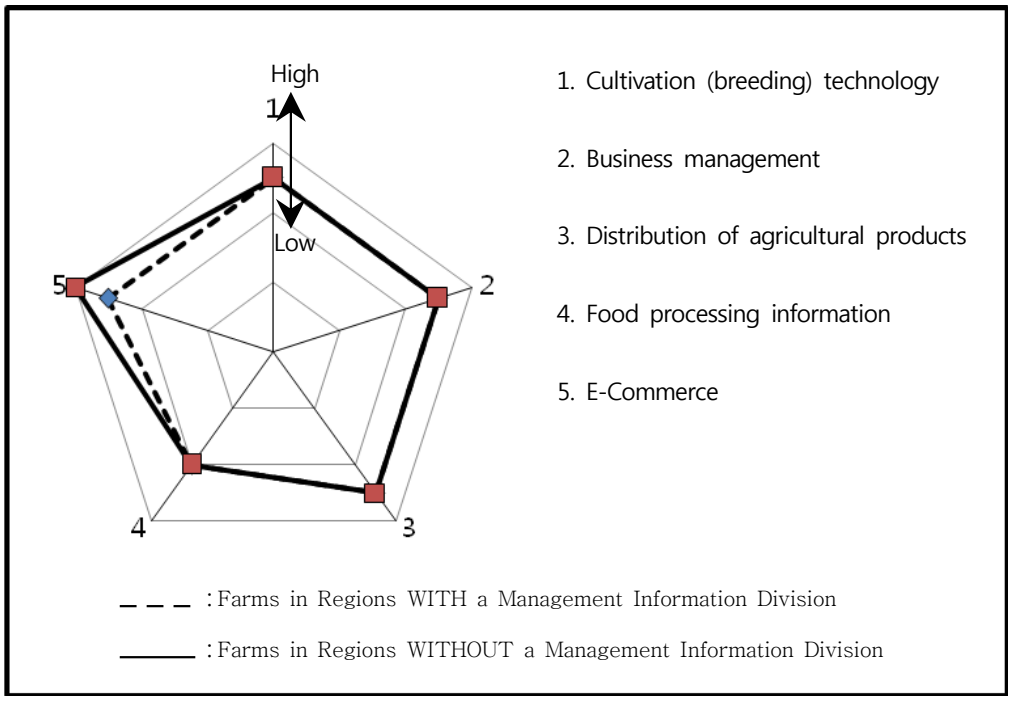

Fig. 1 DifferencesintheDegreeofHelpfulnessofInformationTraining.

Comparing the present and future contributions ranked according to information utilization, both regions responded that e-commerce presently provides the most assistance, whereas food- processing information provides the least help. For the future, however, the 'small but strong farmers' in regions with an Information Management Division

considered the food processing information to be very important, after e-commerce, but the 'small but strong farmers' in regions without an Information Management Division considered the business management information second in importance behind e-commerce.

4.2 Farm Management Software

In the area of farm management software, a large number of 'small but strong farmers' (65%) in regions with an Information Management Division responded that they currently use farm management software, whereas a relatively smaller number of 'small but strong farmers' (49%) in regions without an Information Management Division responded that they currently use management software. In both regions, a lack of knowledge of the relevant program was the most common reason for not using farm management software, and farmers in both regions agreed regarding the future needs and the details of the intended use of such software (transaction management was the most important, whereas financial management had the lowest importance). Moreover, farmers in both regions responded that they require farm management software that is compatible with smart phones because they cannot access a computer frequently due to their work patterns at the farms.

4.3 E-Commerce for Agricultural Products

The proportions of homepage operations in both regions were similar at approximately 70%, but the farmers in the two regions responded differently about the difficulties or their satisfaction regarding the role of technology centers for the vitalization of e-commerce.

Table 7 Differences in E-Commerce for Agricultural Products.

Classification	'Small But Strong Farmers' in Regions WITH an Information Management Division	'Small But Strong Farmers' in Regions WITHOUT an Information Management Division
Business Performance	Facilitated performance improvement in both regions	
Difficulties	Difficulty in modifying information content	Lack of products for sale throughout the year
Role of City or County Agricultural Technology Centers in the Vitalization of E-Commerce	Highly Sufficient	Average

4.4 Agricultural Informatization Training

The experience of informatization training was similar for the respondents in both regions, with an average experience of 18 encounters in the past three years, but several differences were observed in the responses to individual questions.

Table 8 Differences in Agricultural Informatization Training.

Classification	'Small But Strong Farmers' in Regions WITH an Information Management Division	'Small But Strong Farmers' in Regions WITHOUT an Information Management Division
Most Beneficial Training	E-Business Training	Blog, Marketing Training
Level of Training Difficulty	>	
Satisfaction in Training	>	
Supervising Authorities	City or County Agricultural Technology Centers	
Diversity of Supervising Authorities	Many (Korea Information Center for Agriculture, Forestry & Fisheries, Commissioned Training, Rural Development Administration, etc.)	Few (Only City or County Agricultural Technology Centers)

The ‘small but strong farmers’ in regions with an Information Management Division expressed a stronger need for the strengthening of rational, agricultural decision-making methods in future training.

5 Conclusions and Limitations

To compare the performance of informatization support for the ‘small but strong farmers’ in regions with an Information Management Division and for those in regions without an Information Management Division, we surveyed farmers in four areas using the measurement indicators described above and collected expert opinions. As a result, five types of differences were found.

First, information utilization by the ‘small but strong farmers’ in regions with an Information Management Division is higher than in those in which one is not present. Second, there was a similar level of the five main types of training conducted by the city and county Agricultural Technology Centers (i.e., cultivation and breeding technology, business management, the distribution of agricultural products, food processing information, and e-commerce), but the farmers in regions with an Information Management Division receive more assistance in the area of e-commerce. Third, farm management software is more often used by the ‘small but strong farmers’ in regions with an Information Management Division. Fourth, the reported level of difficulty for informatization training is higher for the ‘small but strong farmers’ in regions with an Information Management Division, but their satisfaction with the training is also higher. Fifth, the authorities supervising the informatization training are more diverse for the ‘small but strong farmers’ in regions with an Information Management Division.

Regarding the last point, one reason for this difference may be that the city or county Agricultural Technology Centers in the regions with an Information Management Division invite more supervising authorities to present complex and helpful new information to the farmers. Such proactive activities may lead to the provision of supplemental information that is not typically offered by the city or county Agricultural Technology Centers themselves, with the result that farmers in the region with access to such information may use SNS media more often. Furthermore, as reported in a prior study by Yi-jongSuh (2000), the means of accessing and utilizing information in an informatized society that isformed by the use of information technology is related to the media and the network used. Thus, we expect to find differences in the degree of information utilization between those farmers who use such media frequently and those who do not. In this case, a digital divide would occur. In addition, having more new information could resolve the issue of unfamiliarity with the relevant software, which was the most commonly cited cause among the surveyed farmers for not using farm management software. This difference can be interpreted to have a direct impact on increasing the frequency of farm management software use by farmers in the regions with Information Management Division centers. However, the positive activities of an Information Management Division such as external lectures still tend to be limited in IT technologies related to e-commerce. Therefore, with regards to the degree of helpfulness due to trainingsessions, we can interpret that the ‘small but strong farmers’ in regions with an Information Management Division and the ‘small but strong farmers’ in regions without an Information Management Division both feel as if they are getting similar assistance for everything other than e-commerce.

Together, these five differences led us to conclude that the ‘small but strong farmers’ in regions with an Information Management Division receive more IT services, display higher performance following informatization support, and show a high degree of information utilization. Accordingly, the above differences can be used as the basis for the vitalization of informatization management systems. The limitations of this study include the fact that the overall statistical significance was not established because the surveys and interviews were conducted using selected farmers who were referred to us by researchers at the Rural Development Administration. This selection was implemented to improve survey accuracy with a minimal number of participants; however, we are unable to provide a clear reason for the difference in the present and future contribution rankings according to the information utilization. In future studies, the above limitations must be remedied.

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The General Outlook of Peruvian Agriculture and Its Implications for Korean Agribusiness

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Abstracts Peru is South America's third largest country and enjoys an enormous amount of natural resources. However, However, very few business studies on Peruvian agriculture have been presented. The objectives of this study are to introduce the general status of Peruvian agriculture to Korean business circles and to promote agricultural business opportunities in Korea and Peru.

Secondary data related to Peruvian agriculture are collected and analyzed to understand the current situation of Peruvian agriculture and to suggest an outlook for business opportunities. Findings show that Peru will be a lucrative market for Korean agri-business to target in the near future and it is time for a proactive advance in agriculture by Korean business.

Key words Peruvian agriculture, FTA, distribution channel, systematization, agricultural Environments

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1 Introduction

Global public awareness of obesity has increased the consumption of fresh agricultural products instead of high fat fast foods such as hamburgers and pizza. The recent aging of the population in Asia and Europe has beenanother reason for the interest in fresh and organic food (Park, 2010). It is not surprising that the freshness, safety and nutrition of agricultural products have been more competitive factors than price in the market.

Peru has a large territory, abundant natural resources and inexpensive labor, and thus has strong potential for agricultural growth. Peru enjoys natural diversity because of its western coastal plain, high Andean mountains and immense Amazon basin. Its agricultural products such as grains, fruits, livestock, fisheries and forestry are rich and healthy due to the fertile soil conditions.

Peru has undergone a long period of political struggles from socialist republic to current capitalism. This political movement has hampered economic growth in Peru.

Agricultural price competitiveness in Peru is relatively low because the country lacks physical infrastructure, distribution channels and systematization in its production center. However, Peru produces many quality products under natural conditions, which sheds light on the future of Peruvian agriculture.

This study is designed to introduce the current situation in Peruvian agriculture as a center of an emerging market in Latin America and to promote agricultural business opportunities for both Korea and Peru. To achieve these objectives, this study examines the agricultural environment and price trends of agricultural products in Peru, and its overall economic situation which is growing by 6 or 7 % a year. Within this context, this study will review the Free Trade Agreement between Korea and Peru with a special focus on agriculture.

Finally this paper presents some implications for Korean

agribusiness in terms of exports, imports and investment in the agricultural industry.

2 General Status of Peru

2.1 Administrative and political system

Peru is South America's third largest country, covering 1,285,215 ㎢. Peru's territory, according to the Regionalization Law that was passed on November 18, 2002, is divided into 25 regions. These regions are subdivided into 195 provinces, which are composed of 1,833 districts. The Lima Province, in the central coast area of the country, is unique because it does not belong to any of the twenty-five regions. The city of Lima, the nation's capital, is located in this province. Callao has its own region, even though it contains only one province, the Constitutional Province of Callao.

Peru is a constitutional republic with a civil law system. The president is popularly elected for a 5-year term. A constitutional amendment passed in 2000 prevents immediate reelection, but allows unlimited nonconsecutive terms. The first and second vice-presidents are also popularly elected but have no constitutional functions unless the president is unable to discharge his duties. The principal executive body is the Council of Ministers, which is comprised of 17 members following the creation in 2010 of the Ministry of Culture, and the Council is headed by a prime minister. The president appoints the Councilmembers, who must be ratified by the Congress. All executive laws sent to Congress must be approved by the Council of Ministers.

The legislative branch consists of a unicameral Congress of 120 members. In addition to passing laws, Congress ratifies treaties, authorizes government loans, and approves the government budget. Members are elected by popular vote to serve five-year terms.

The judicial branch of government is headed by a 16-member Supreme Court. The Constitutional Tribunal interprets the constitution regarding matters of individual rights. Superior courts in regional capitals review appeals based on decisions taken by lower courts. Courts of first instance are located in the provincial capitals and are divided into civil, penal, and special chambers. The judiciary has created several temporary specialized courts in an attempt to reduce the large backlog of cases pending final court action.

2.2 Social and economic conditions

The total population of Peru is 29,248,943 as of July 2011. Peru's ethnic groups are Indigenous (45%); mixed background termed "mestizo" (37%); European (15%); African, Japanese, Chinese, and other (3%). Approximately 30% of the population lives in the Lima/Callao metropolitan area, and the annual population growth rate is 1.11%.

The results of the population census of 2007 revealed that the level of education of the population aged 15 and older has improved compared to the level recorded in 1993. In 2007, 31.1% of the population aged 15 and older had completed some years of higher education. Compared to the results obtained from the Population Census of 1993, the population having experienced higher education has increased by 112.0% (3,129,339 people).

Peru's economy reflects its varied geography. Abundant mineral resources are found in the mountainous areas, and Peru's coastal waters provide excellent fishing grounds. The Peruvian economy grew by almost 6% per year during the period 2002-06, with a stable exchange rate and low inflation. Growth jumped to nearly 9% per year in 2007 and 10% in 2008, driven by private investment and government spending, but then fell to less than 1% in 2009 in the face of the world recession, a sharp fall in private investment, and a substantial increase in counter-cyclical government spending. Growth resumed in 2010 at more than 8%, due partly to an increase in private investment and continued high government spending.

Peru's economic growth was strong over the 7 years before 2008, averaging 6.8% per year, resulting from market-oriented economic reforms and privatizations carried out in the 1990s. GDP grew 9.8% in 2008, 8.9% in 2007, 7.7% in 2006, and 6.8% in 2005. Economic expansion in recent years has been driven by construction, mining, private investment, exports, and domestic consumption. Peru's economy is well managed, and improved tax collection and growth have increased revenues, with expenditures keeping pace. Private investment is rising and becoming more broadly based. Peru obtained investment grade status in 2008.

Peru's exports reached $26.6 billion in 2009, partly due to lower mineral prices. Peru's major trading partners are the U.S., China, EU, Switzerland, Canada, and Japan. Peru belongs to the Andean Community, the Asia-Pacific Economic Cooperation (APEC) forum, and the World Trade Organization (WTO). Peru has limited trade agreements with Chile and Mexico, signed more robust agreements with Canada and Singapore in 2008, and concluded trade agreements with China and the European Union in 2009 and 2010, respectively.

2.3 Natural conditions

Peru is located in Western South America, bordering the South Pacific Ocean, between Chile and Ecuador. It shares borders withBolivia (1,075 km), Brazil (2,995 km), Chile (171 km), Colombia (1,800 km) and Ecuador (1,420 km).

Peruvian territory consists of the western coastal plain (Costa), the high and rugged Andean mountains in the center (Sierra) and the eastern lowland with tropical forests that are part of the Amazon basin (Selva). The lowest point is the Pacific Ocean at 0 m, and the highest is Nevado Huascaran at 6,768 m. Peru's climate varies from tropical in the east to dry desert in the west.

Peru has many land-based resources such as copper, silver, gold, petroleum, timber, fish, iron ore, coal, phosphate, potash, hydropower and natural gas.

Peru contains 128,521,560 ha of land, but only 25,525,000 ha (19.86%) are suitable for agriculture and livestock. The soils throughout the Western Cordillera to the northern Andes are relatively young and subject to wind and water erosion due to steep gradients. The region is covered by heavily eroded desert soils with low moisture content and high in organic matter and mineral salts. In the more poorly drained soils with a permeable sandy horizon, the land is relatively fertile. At higher elevations, the soils are thin and stony. On the east side of the eastern mountains, descending to the Amazon basin, thin soils, which are poorly developed and damp, are subject to considerable erosion. The coast of Peru is a desert wasteland, often rocky and mountainous, and marked by fifty-two small rivers that descend through steep and arid mountains towards the Pacific.

3 Agricultural Economy

3.1 Agriculture, livestock, forest and fisheries

Peruvian agriculture has abundant grains and crops, including grains (barley, wheat), crops (asparagus, coffee, cocoa, cotton, sugarcane, rice, potatoes, corn, coca, tomatoes, medicinal plants, palm oil, marigold, onion and dry beans) and fruits (plantains, grapes, oranges, pineapples, guavas, bananas, apples, lemons, mango and pears). Peruvian livestock production index is 116.2%, and meat production is 715,000 metric tons annually.

The Peruvian forest resources include natural forests, forest plantations and lands mainly used for production and forest protection, and protection of other components of the emerging terrestrial and aquatic flora, regardless of their location in the country. Forest resources and wildlife as well as State land that is mainly forest, make up the National Forest Patrimony. These resources can not be used for agricultural or other activities that affect the vegetation, or the conservation and sustainable use of the forest resources, regardless of their location, with exceptions for law enforcement.

Peru is among the world's most biodiverse countries, although this status is threatened by deforestation and soil degradation. Deforestation, which is occurring at an annual rate of 0.1%, is caused by slash-and-burn agricultural methods, cattle ranching, infrastructure development, mining and illegal logging. The country ranks second in South America in surface area of natural forest (after Brazil) and seventh in the world. At the national level, approximately 90% of the forested area is located in the Peruvian Amazon (more than 70 million hectares), representing 60% of Peruvian territory. The forestry sector participates in the national economy mainly through the production of goods such as food, energy and manufactured goods, and the provision of private and government services that benefit society.

In Peru, we can distinguish three distinct fishing basins: the Pacific Ocean, Lake Titicaca and the Amazon River basin. The most important of these is the Pacific, which covers an area of 26.249 ㎢. Among the marine resources, we include anchovy, tuna, bonito, mackerel, whales, dolphins, octopus and squid. In the coastal rivers, we find shrimp, mackerel and loach. In the rivers, lakes and lagoons of the highlands, there is plently of suche and trout, anintroduced species. In the rivers of the jungle, we find paiche, catfish, boquichico, and halibut, among others, that represent great natural potential.

3.2 Agricultural materials and farm machines

Agricultural materials are represented by Standard & Poor's GSCI Agriculture Index, which is composed of futures for wheat, Kansas wheat, corn, soybeans, cotton, sugar, coffee and cocoa.

S&P GSCI Agriculture Index Components Dollar Weights

	Dollar Weights
Agriculture	
Wheat	21.6%
Kansas Wheat	4.5%
Corn	24.8%
Soybeans	15.3%
Cotton	10.3%
Sugar	15.8%
Coffee	5.9%
Cocoa	1.7%
	100.0%

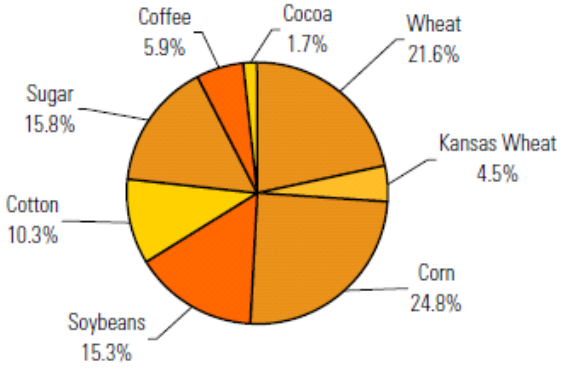

Fig. 1 Agriculture Index Component
Source : Standard & Poor's. Data as of December 31, 2010

On the demand side, emerging countries continue to drive up prices through an increase in population and purchasing power. On the supply side, the urbanization of these emerging countries is also leading to a decline in the area of ultivation. Therefore, although demand is increasing, supply has experienced only modest growth in recent years, and this will continue to increase the price of these raw materials further. This price pressure is accelerated by the effects of climate change, to which these products are particularly sensitive, as has been observed this year.

During 2010,imports of machinery and equipment for agricultural tractors included machinery (63.4%), harvesting (17.2%), forestry tractors (5.7%) and farm records (2.7%).

3.3 Price trend of major agricultural products

3.3.1 Coffee

Peruvian coffee formed 93.6 % of Korean agricultural imports from Peru at the end of 2008 (AT, 2010).

Between 1990 and 2000, international coffee prices were erratic. The decade began with low prices, reaching its lowest level in 1992. Due to a global decrease in production in 1993, prices recovered slightly and began an upward trend in 1994. In 1995 and 1996, prices decreased while remaining above U.S. $ 150.00 per quintal. In 1997, coffee prices rise again due to the influence of low stocks, droughts and frosts in Brazil, strikes in Colombia and speculation. Due to global overprotection of coffee from 1998 onwards, prices have steadily decreased, reaching their lowest point in 2001. Coffee is the second-ranking "commodity" after oil, and its price is determined by the interactions between supply and demand in global stock markets. Prices differ depending on the variety of coffee. The international coffee trade is extremely unstable, with changes that may occur in the course of a few months, weeks or days, or even on the day of the transactions.

Fig. 2 Coffee: evolution of farm prices

In recent years, farm-gate prices have generally followed the international price trend, increasing or decreasing according to changes in international prices. However, the variation in farm prices has been lower than that in international market prices, which appears to suggest that a re-distribution has occurred to producers who receive a larger share of the international price. In fact, in 1990, the international price exceeded the farm price for 2001 by 3.1 times.It is likely that the largest farming organization has

succeeded in retaining a greater proportion of the international prices for itself. Undoubtedly,this is an area that deserves further investigation. Currently, in the years between 2000 and 2006, farm prices have followed international price trends.

The commercialization system in Peru is determined by the organizational forms of the productive sector, traditional practices, and methods of processing and production. The coffee business involves several types of intermediaries, resulting in high transaction costs and generating inefficiencies in the coffee chain. In the coffee market,one or more middlemen traders, who receive various names according to zones, collect the coffee that is geographically dispersed and produced in small volumes. These middlemen pay low prices to the producers and blend various qualities and origins of coffee, further distorting the quality of the coffee.

3.3.2 Potato

Peru takes pride in its potatoes and produces more than 3,000 species of potatoes on the Andes Mountains. However, Peruvian potatoes are poorly traded in international markets because of their high prices. The major exporters in the international potato market are France and Germany, and Korea imports potatoes mainly from Australia and the United States (Chung, 2010).

Local wholesale prices for potatoes paid to the main markets in Metropolitan Lima have remained almost stable, as shown in Figure 3 below. In 2000, the price was S / 0.49 per kg in 2006, the price was S / 0.59 per kg.

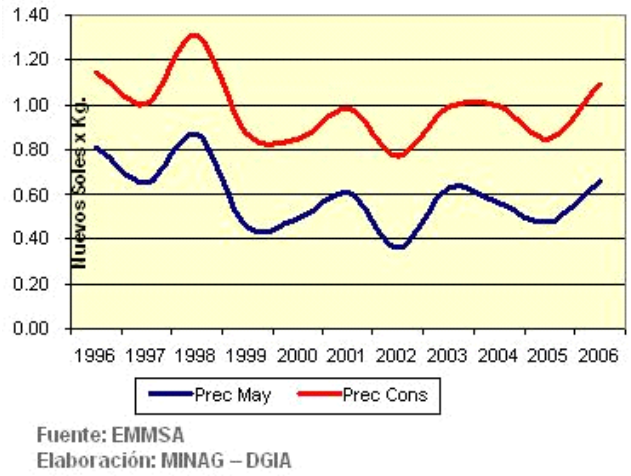

Fig. 3 Average potato prices at wholesale and retail in the wholesale markets 1 and 2 of Metropolitan Lima(2000 - 2006)

In the period 2000 - 2006, producer prices have performed well and steadily, as shown in the Figure 4. Thus, in January 2000, the price paid to producers was S /. 0.20 per kg. In December 2006, the price was S / 0.49. Hence, the price increased by 145%.

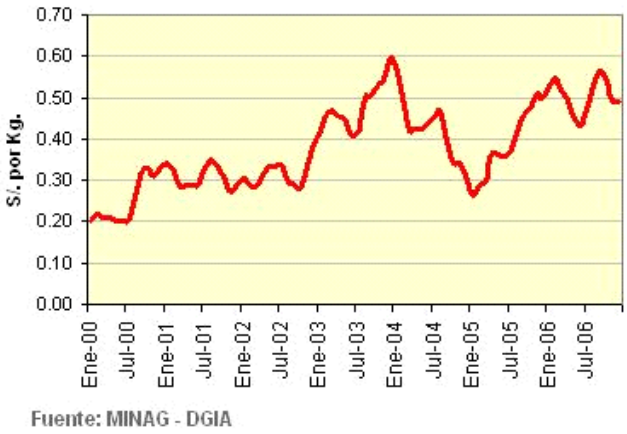

Fig. 4 Average farm price of potatoes from 2000 to 2006

As shown in the graph, the trend in producer prices has been increasing yearly, showing positive growth, even though the product has a seasonal supply.

3.3.3 Rice

Rice is the chief article of food for the Peruvian people, and one of the most important government policies is increasing rice output. Currently, rice ranks third in crop production after maize and potato in Peru, but it will rank first in the near future.

Paddy rice prices paid to farm producers vary during the year. They tend to decrease during the months of the major rice harvests in each region and are influenced by higher or lower levels of rice imports. The lowest prices are usually found in the months of May, June and July.

During 2000 - 2010, real producer prices of paddy rice trended downward, as Figure 5 illustrates, but with significant fluctuations.

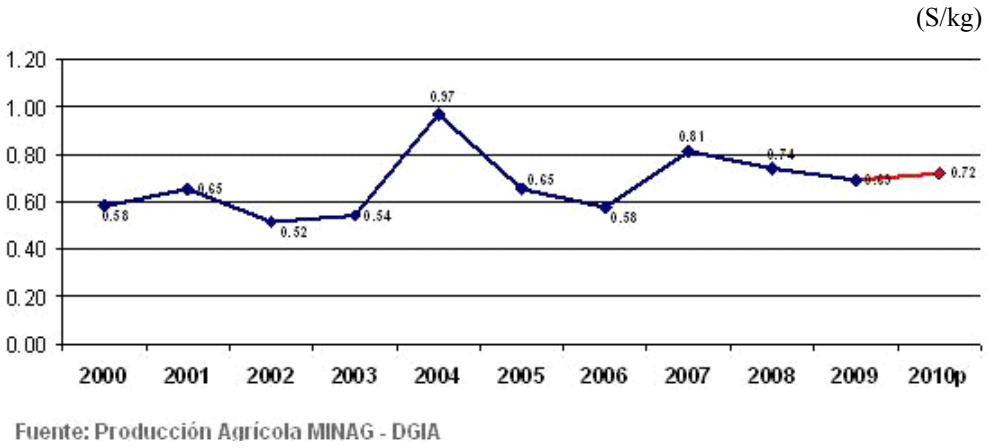

Fig. 5 Farm-gate prices of paddy rice from 2000 to 2010

3.3.4 Cotton

Producer prices of the 2006 - 2007 cotton season started with an average price of S /. 121.5 per quintal-branch put in gin, then rose to S /.128 in February; in the month of March, the price decreased to approximately S/.123 soles per quintal-branch in the Ica Valley. When the harvest started, the price rose to S /.131 on average in the Chincha Valley and remained almost stable.

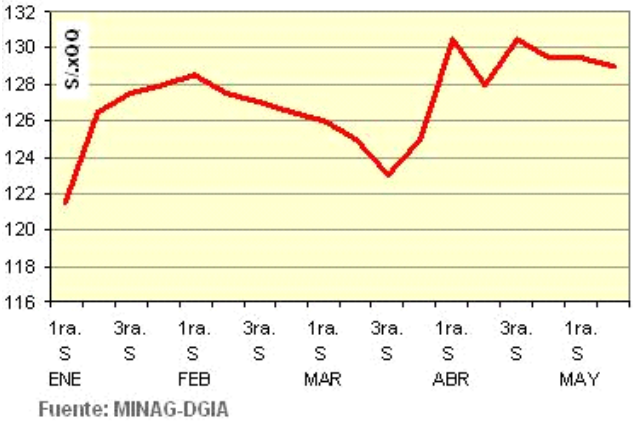

Fig. 6 Farm price of cotton - 2007

3.3.5 Asparagus

Asparagus prices paid to producers were S /.1.88 per kg in January 2002 and increased to S /.2.62 per kg in December 2006, registering a growth with constant variations from month to month. In the last two years, asparagus prices were highly variable.

Fig. 7 Average prices of asparagus paid to farm producers from 2002 to 2006

3.3.6 Sugar cane

Wholesale prices of white and brown sugar have been increasing. The price of white sugar was S/.79 per 50-kg bag in the year 2000, and reached S /.101 on average per 50-kg bag in 2006. Brown sugar showed a similar trend. The wholesale price of brown sugar was S /.74.50 in 2007.

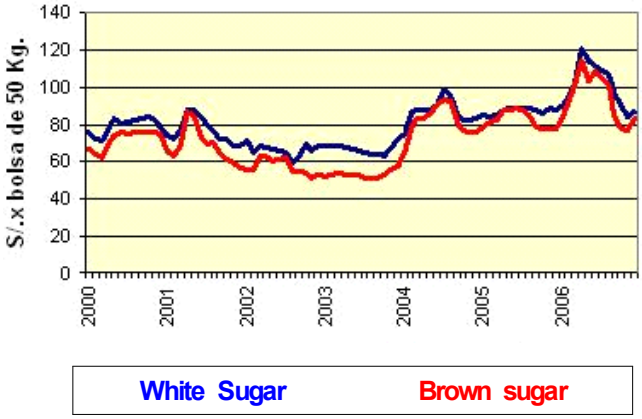

Fig. 8 Wholesale prices of white sugar and brown sugar from 2000 to 2006

Consumer prices of white sugar and brown sugar show a clear downward trend between 2000 and 2003, but prices began to rise in 2004, and reached an average price of S /.114.7 per 50-kg bag (white sugar) in 2006. The same occurred with brown sugar, the average price of which increased to S /. 109.7 per 50-kg bag.

3.3.7 Maize

The behavior of farm prices for maize is presented in Table 1. In 2009, the price of maize was 0.68 nuevos soles per kg, a dramatic decrease of 0.8% compared to 2008 when it was 0.74 nuevos soles per kg. This drastic reduction was present in the regions of Lambayeque, Lima, Ancash and San Martín, and resulted from the effect of the international financial crisis on international prices and increased U.S. production.

Table 1 Prices in maize fields (S /Kg)

Regiones	Campañas		Variación	
	2008	2009	ha.	%
Nacional	0.74	0.68	-0.06	-8
Piura	0.77	0.76	-0.01	-1
Lambayeque	0.78	0.64	-0.14	-18
La Libertad	0.76	0.75	-0.01	-1
Cajamarca	0.66	0.62	-0.04	-6
Ancash	0.85	0.73	-0.12	-14
Lima	0.81	0.69	-0.12	-15
Ica	0.69	0.90	0.21	30
San Martin	0.51	0.48	-0.03	-6
Loreto	0.50	0.52	0.02	4
Huanucp	0.81	0.80	-0.01	-1
Ucayali	0.61	0.65	0.04	7

Prices at the farming region level vary depending on the distance where they are located from feed processing plants. In the coastal region, prices have decreased by almost 16 percent because the industry is located in La Libertad, Lima and Ica; in the forest, prices decreased by only 5.4 % because the largest industry is located in Tarapoto - San Martin. One particular case in the mountains has shown an increase of 2.3 percent due to increased demand from the population of this region, which is consuming maize at a higher rate.

Table 2 Field prices of corn (U.S. $ / t)

	January-December		
Region	2008	2009	Var. %
Coast	276	232	-15.7
Jungle	228	216	-5.4
Sierra	295	301	2.3
National	254	227	-10.5

3.4 Farm management

Peru has several distinct land areas that severely limit the development of agricultural crops and livestock. The Western coast (Costa) is mountainous and arid desert. The Andes mountain range in the center of the country (the Andean Highlands or Sierra) is high and rugged. Less than one-fourth of the Sierra includes cold, high-altitude grass lands (the Puna), which is a natural pasture. The Puna widens into an extensive plateau, the Altiplano, which adjoins Bolivia in the southern Sierra. The Eastern lowlands consist of semi- tropical and rugged cloud forests of eastern slopes (Montaña), that lie between 800 and 3,800m above sea level and jungle (Selva), which includes the high jungle (Selva alta), lying between 400 and 800m, and the tropical lowland forest (Selva baja) of the Amazon Basin that lies between 80 and 400 m. The Costa, Sierra, and Selva form the major terrestrial regions of the country. However, each area contains special ecological niches and microclimates generated by ocean currents, the wide altitude range of the Andes, various solar angles and slopes, and the configurations of the vast Amazonian area. Because of these complexities, a large number of ecological sub-regions have been identified by different authors for different purposes. Over all, land use is as follows: 3 percent arable, 21 percent meadows and pastures, 55percent forest and woodland, and 21percent other, including 1 percent irrigated land.

Table 3 Peruvian land resources

(1000 ha)

Land area	Agricultural area	Arable Land	Permanent crops	Permanent pastures	Arable, % of agricultural area	Agricultural, % of land area
128,000	31,270	3,670	500	27,100	12	24

(Source : FAO databases 2000)

4 Agricultural Conditions

4.1 Outlines of the agricultural sector

Peru's agricultural sector has changed frequently over the last 30 years. From a closed, highly subsidized system in the 1980s, it has evolved into a free-market system. As part of a structural adjustment, the government cut farm subsidies and eliminated subsidized agricultural credit. As the cost of pesticides and other agro-inputs soared, the government tried to cushion the impact on farmers by changing agrarian reform laws, allowing private institutions to invest in agriculture, and creating a new agricultural credit system. It also created new institutions such as the Servicio Nacional de Sanidad Agraria (SENASA), that oversees pest and disease control.

Bridging old policy gaps, current agricultural policies address natural resource management and environmental issues. The state's new collaboration with non-governmental organizations is a reversal of a decades-old perception of Non Government Organizations as competitors. The government is also transferring some services such as potato seed production and extension services to the private sector, and farmers' organizations are operating some experimental stations. NGO policies have also changed over the last thirty years. Once politically focused, NGOs today take a pragmatic approach, solving concrete problems in rural areas and are increasingly involved in sustainable development initiatives. After drastic cuts in the agricultural research, extension, and credit systems in the early 1990s,NGOs began to provide farmers with these services. Today, they deliver more than 80 percent of all extension services. Although uncommon in the past, inter-institutional cooperation among research and extension institutions is growing to meet the persistent demand from farmers facing serious problems.

In 1969, Peru went through a sweeping agrarian reform program that established large Agricultural Production Cooperatives. However, during the 1980s, most of the land was informally divided among individual members, and in the early 1990s, the government liberalized the sale and lease of land and implemented the Special Project of Land Titling. According to the latest agricultural census (1994), a significant number of farmers have not been given a registered valid land property title, and almost 85 percent of farms are between 0 and 10 ha in size, accounting for merely approximately 9 percent of the agricultural area.

4.2 Agricultural production

The major crops are cocoa, beans, fruits, vegetables, legumes, tubers, roots, cereals and coffee, which have been

directed at national and international markets. Other crops include mangoes, bananas, avocados, asparagus and onions, mainly for export. Similarly, the area devoted to crops that supply the domestic market, such as peas, corn, corn starch, wheat, rice, beans, potatoes and cassava, has been expanded.

Peru's agriculture is highly diversified but not well integrated. In an irrigated section of the coastal desert lowlands, more than 1,195,000 ha (2,953,000 acres) are cultivated with cotton, sugar, rice, soybeans, pulses, fruits, tobacco, and flowers. Modern methods are widely used in this area, and as a result, output has risen at a much faster rate than population growth. The Sierra, in contrast, is relatively dormant, its lands being inferior or impractical to till, and contributes with amaranth, maca, quinoa, wheat, olluco, almonds, cherries, cereals, raisins, tubers, beans, corn, potatoes, sweet potatoes, pumpkin, beans and yacon. The Selva contributes cocoa, fruits and nuts, tea, coffee, tobacco, and forest products.

During 2010, the harvested area of he major crops in the country reached 4,823,229 ha, an increase of 10.1% over 2005, when these same crops were planted in an area of ,933, 650 ha. The product showing the greatest increase is cocoa, of which 50,313 ha were harvested in 2005, while last year, 74,209 ha were harvested; this represents an increase of 23,896 ha, equivalent to 47.5% of the harvested area. Other referenced products such as beans, fruits, vegetables, legumes, tubers, roots, grains, and coffee have also increased. Minor cropsthat have experienced and increase in harvested area include mangoes, bananas, avocados, asparagus and onions, mainly for export. The harvested area for agribusiness products such as palm oil and sugarcane increased by 12.9%. This extension in crop area is due to consumer trends, which are becoming increasingly oriented toward a demand for products with improved nutritional value, such as vegetables, legumes and cereals.

The supply of the main wholesale markets in metropolitan Lima, which can be taken as a reference for agricultural production and agribusiness, reached a total volume of 1.5 million tons from January to June of 2009, 1.6% less (23,500 less) than the figure for the same period of 2010.

4.3 Agricultural policy and administration

Peru's agricultural sector has undergone changes over the past four decades, with swings caused by permanent social, economic and political adjustments and expansions However, the sector has not consolidated a path of sustained growth in agricultural activity.

The 1960s began with a major expansion of agricultural production, but in 1962, a stalemate began that lasted until the completion of the agrarian reform, interrupted with a brief expansion around 1967. Agricultural policy during the 1970s was characterized by astrong expansion of state participation. In the field, this resulted in the expropriation of estates and their conversion into larger units of social property associations; this was based on the assumption that improved distribution of land would result in greater development of agriculture and the rural area.

In the 1980s, various forms of state intervention were maintained in agriculture in the midst of a deep economic crisis and the beginning of terrorist activity. In July 1990, the orientation of economic policy, including agriculture, was to let "market forces" leadthe development of the national economy. This decade also saw the defeat of terrorism, which no doubt contributed to an improvement in the living conditions in the field and hence the development of farming.

Economic reforms that have a strong impact on the agricultural sector include the elimination of agricultural price controls, prices of refuge and security the liquidation of the Agrarian Bank, which was the source of financing for agriculture par excellence; and thus, the elimination of preferential interest rates for agriculture.

In this sense, we can conclude that the instability caused by these policies in principle and compounded by external factors has prevented Peru from developing a stable path of sustained growth for the sector.

4.4 Agricultural Infrastructure

4.4.1 Water resources

Peruvian territory consists of the western coastal plain (costa), the high and rugged Andean mountains in the center (sierra) and the eastern lowland with tropical forests that are part of the Amazon basin (selva). Costa is a desert wasteland, often rocky and mountainous, and marked by fifty-two small rivers that descend through steep and arid mountains toward the Pacific. Costa generates more than 60 percent of Peruvian agriculture by harnessing those fifty-two small rivers.

The volume of water stored in the Pochos, San Lorenzo and Gallito Ciego reservoirs in July is greater than 70% of their maximum capacities and remains sufficient for the beginning of the crop. However, the Tinajones (Lambayeque) reservoir contains only 23.9% of its maximum capacity in late July. If this trend continues, the reservoir might not be able to provide sufficient water to ensure good resource planning for the entire year.

The volume of water stored in the reservoirs of the Chili System (Arequipa) is greater than 60% f their maximum capacities, which allows for proper planning for the agricultural season.

4.4.2 Irrigation

The agricultural area of Peru comprises 5,891,000 ha, 70% of which is cultivated without irrigation. Of the irrigated land, 50% (877,000 ha) of irrigated land uses reservoir water. Almost a quarter of the agricultural units containing irrigated land are supplied exclusively from springs.

Of the agricultural units, 82%, including 79.1% of the agricultural land under irrigation, uses channels without any coating. Just 5,682 farming units in the country use only lined canals or ditches.

Peruvian agricultural land represents only 4.3% of its territory; approximately 5.5 million ha are used, of which 3.75 million ha is based on rain-fed agriculture and 1.75 million ha uses irrigation infrastructure. Table 4 lists the allocation of irrigation infrastructure in Peru.

Table 4 Area with Irrigation Infrastructure and irrigated areas (thousand ha)

Region	Infrastructure	%
Coast	1190	68
Sierra	453	26
Jungle	109	6
Total	1752	100

Source : Portal Agrario (1994)

Approximately 80% of all water withdrawal in Peru is used for irrigation, yet much of this water (65%) is lost due to reliance on inefficientirrigation systems. The overall efficiency of water use in irrigation systems is estimated at approximately 35%, which is considered poor performance; the inefficiency is due mainly to leaky distribution systems and the widespread use of unimproved gravity and flooding irrigation methods, providing an overall estimated efficiency of 50%. Water is rarely metered, and fees are mostly based on the number of hectares irrigated rather than on the volume of water used. Inadequate irrigation management and systems lead to pervasive irrigation practices, with farmers applying water in excess of crop requirements and water availability. The coastal region, due to its climatic conditions, depends on water supplied by Andeanrivers (surface water) that is channeled through the irrigation systems. In 1997, surface water supplied 97% of the fields by gravity irrigation (822,473 ha) and 3% of the fields by pressurized irrigation (19,680 ha). In the Costa region, landholdings are relatively large, and agriculture is mostly commercialized and devoted to exports. In the Sierra and the Selva regions, which have 97% of Peru's available water, surface water supplies agricultural fields through furrow irrigation. Irrigation systems consist of open canal networks, generally unlined, with rudimentary water intakes and distribution systems supplying small plots devoted mostly to subsistence agriculture. Less than 5% of the irrigated land is equipped with improved on-farm irrigation systems.

5 Agricultural Distribution and Processing

5.1 Agricultural wholesale market

In Lima, agricultural market perishables are estimated at U.S. $650 million per year, and the channel is made p of wholesale markets No. 1 and No. 2, which sold 81% of the total; the distribution channel of supermarkets is 19%.

In wholesale market No.1, the 15 largest wholesalers sold 22% of the potatoes, 44% of the onions and 46% of the lemons; this confirms the existence of a small group of wholesalers (no more than one-third for each rotation), which isclearly differentiated from the others, giving rise to the so-called product line "kings" who monopolize the market by abusing their dominant position.

5.2 Agricultural distribution and export

The principal export products of Peru are quinoa, amaranth and coffee.Quinoa, called a super crop of the next generation, ranks next to milk in nutritional value because it contains abundant protein, starch, vitamins and minerals. In 2010, quinoa and amaranth exports increased by 79% and 71%, respectively. The main destinations were the United States and Germany. In the first half of 2011, quinoa exports totaling U.S. $8.6 million represented growth of 79% compared to 2010 (U.S. $4.8 million).

The main destination of quinoa exports was the United States (U.S. $6.4 million (74% of the total)); the next largest exports were to Germany (U.S. $492,000 (6%)) and Italy (U.S. $192,000 (2%)).

Amaranth was exported to 13 countries. Germany was the main destination (U.S.$287,000 (36% of the total)); the next largest exports were to Japan (U.S. $216,000 (27%)) and

the Netherlands ($105,000 (13 %)).

During January-June of 2011, 54,000 tons of coffee were exported, exceeding by 11.6% the exports of the same period during the previous year. Germany remains the main market for Peruvian coffee,purchasing 30.1% (16,000 metric tons); the next largest exports were to the United States (18.7% (10,000 MT)), Colombia (16.3% (9,000 MT)), Belgium (8.7% (5,000 MT)) and Italy (4.4% (2,000 MT).) Additionally, for the first time, coffee was exported to Hong Kong (38 MT, worth U.S. $148,300).

5.3 Overall status of the food processing industry

The food industry shrank by 0.7 percent in 2009, but private consumption increased by 2.4 percentbecause of the impact of the international financial crisis on exports. As a result, two distinct trends emerged. The production of prepared and preserved meat increased by 4.6 percent, a rate that has held steady for eleven consecutive years. The leading companies in the domestic market have been able to further diversify their offering of food stuffs. The sausage industry, with a wider variety of products, continues to enter households advantageously.

The production of vegetable and animal oils and fat was slightly higher (1.6 percent) than in the previous year. The industry showed heavy plant capacity use (83 percent) and was able to cope despite of strong competition from Bolivian and Argentinean imports. Margarine output increased by 8.3 percent because it replaced imports.

Growth in the milling industry was moderate (1.7 percent). Although the decrease in international wheat prices kept demand steady, wheat flour smuggling persisted in southern Peru. Baked goods and noodles evolved favorably, increasing by 4.1 percent and 4.6 percent, respectively. Fruit and vegetable processing and preserving, however, decreased by 9.5 percent because international shipments of these products were reduced. Frozen and canned asparagus manufacturing decreased 27 percent.

The economic crisis affected the demand for other food products (gelatins, snacks and aromatic drinks, etc.) by 2.7 percent. This was reflected in a decline in diverse snacks (-3.2 percent), although growth was positive for teas (8.0 percent), instant desserts (7.5 percent), and instant beverages (0.9 percent).

5.3.1 Processed grain/crop products

Andean grains have great versatility; primary and agro-products can be transformed into products with a variety of flavors, colors and shapes. Traditional Andean farmers have their ownprocesses and transformational methods. Their experience should be exploited fully by the ongoing development of technology, as should new knowledge regarding the use of genetic diversity and the specific use of this diversity in the transformation of quinoa.

There is a specific use and characteristic for each genotype provided by the wide genetic variability. A genotype appropriate for roasting will not provide the same advantages and characteristics as those found in varieties suitable for the production of noodles. Fishmeal and its varieties may not be used efficiently for soups. However, due to the versatility of quinoa, any genotypes are currently useful for any processed products. Quinoa contains with fewer negative features, producing lasting quality, and there are even some tasteless varieties.

Amaranth, canihua and lupine also havemany and varied uses, which can be properly harnessed and transformed to radically change their current underutilized situation. Amaranth is used and transformed in the same way as quinoa and has even greater competitive advantages. We should take advantage of the exceptional qualities of canihua, such as the high iron content in both the leaves and the grain, the high quality and quantity of its fiber, its use as forage, and the use of its fishmeal qualities to obtainthe best bread, especially for those who are unable to digest wheat gluten. Canihua is now cultivated in isolated wilderness areas and cold climates. Lupine requires processing technology for proper and comprehensive use as a plant grain. In most of the grain-producing areas, lupine is processed, cooked and cleaned to remove the alkaloids.

5.3.2 Dairy products

The production of dairy products declined by three percent, despite a significant increase (15.5 percent) in yogurt production resulting from a growing consumer preference for natural and dietetic products. However, the decrease in evaporated milk and cheese production by 8.6 and 17.8 percent, respectively, can be attributed to a decrease in exports and government procurement problems. Condensed/ evaporated milk accounts for 95 percent of dairy products by value, mainly because evaporated milk is the favorite dairy product in Peru and is the milk consumed at breakfast. In 2009, Peru continued to lead in the global per capita consumption of condensed / evaporated milk at 11 liters, followed by Hong Kong with five liters. The vast majority of other countries only use evaporated/condensed milk in specific dishes and desserts, whereas evaporated milk is the primary milk used in Peru because fresh and UHT milk consumption remains very low.

Companies competing within the evaporated milk market are expected to develop more functional varieties as competition from long-life / UHT milk increases. Gloria and Nestlecould launch evaporated milk in small aseptic brick packaging, targeting mid-income households in search of more practical packaging formats.

In 2009, the yearly per capita consumption of packaged cheese stands at 1.5 kg, significantly lower than the regional average of almost 3 kg. The main reason for this low level of consumption is that low and medium-income earners prefer artisanal cheese that can be bought in open markets and in some independent small grocers. Artisanal cheese isvalued for its freshness and low price. Despite this, packaged cheese has plenty of opportunity for growth because high and mid-income households are increasingly demanding higher-quality products obtained from a reliable source and with more sophisticated features.

Drinking yogurt is growing rapidly in the Peruvian market. Increased demand from middle and upper-income consumers can be attributed to the wide availability of several packaging sizes and the increasing range of added-value products and flavors, some of them based on Peruvian fruits. Nevertheless, per capita expenditure on drinking yogurt in Peru stands at just US $1.50 in 2009, significantly lower than the regional average of nearly US $6.00. This means that there is still significant potential for penetration, particularly among low-middle income households. Drinking yogurt is growing rapidly in the Peruvian market. Increased demand from middle and upper-income consumers can be attributed to the wide availability of several packaging sizes and the increasing range of added-value products and flavors, some of them based on Peruvian fruits. Nevertheless, the per capita expenditure on drinking yogurt in Peru was just US $1.50 in 2009, significantly lower than the regional average of nearly US $6.00. This means that there is still significant potential for penetration, particularly among low-middle income households.

Drinking yogurt is the most popular type of product in the category due to its practicality, ease of consumption, and the wide availability of flavors, packaging sizes and added-value products. Traditional flavors include strawberry, French vanilla, peach and lucuma. Newer flavors include berry and several other flavors based on tropical fruits such aslúcuma, aguaymanto and camu camu.

Domestic companies, led by Grupo Gloria SA and Laive SA, dominate the other dairy products category; the two companies accounted for an 83 percent value share in 2009. Grupo Gloria offers a wide variety of brands, has an excellent distribution network and offers affordable prices that allow its product to be purchased by consumers from different socio-economic segments of the population. Despite this, the multinational Nestle has achieved significant penetration of the local market and constitutes the mainthreat to local players.

5.3.3 Beef products

Peru is currently a relatively small beef producer and only exports minor quantities. Exports are focused on regional markets because the major foreign markets require certification for Foot and Mouth Disease and BSE. Table 5 shows the production, export and import data for the region. Competitors in the region include Argentina and Brazil, while major global exporters such as the United States, Australia and New Zealand also compete with Peruvian exporters in the major markets.

Table 5 Production, export and import of beef products

Year	Cattle population	Meat Production	Exports	Imports
2005	5241,298	153	66	26042
2006	5300000*	161	12	21078
2007	5300000*	165	117	23200

Source : Cattle Number and Meat Production HS 021,0202 (MT) - FAOSTAT *FAO Estimate

5.3.4 Fishery processing products

Peru is a large exporter of fish meal and also exports fresh and frozen fish for human consumption. The Peruvian fishing industry, primarily based on the export of fish meal used in poultry feed, is among the largest in the world. Peru's fishing sector led the world during the mid-1960s, although production since then has fluctuated radically. During the 1970s, overfishing nearly led to the disappearance of the anchovy. Production regulation is being reorganized from a global fishing quota to individual quotas distributed among fishing boats. The global quota in 2008 was 7.5 million metric tons.

(1,000 metric tons)

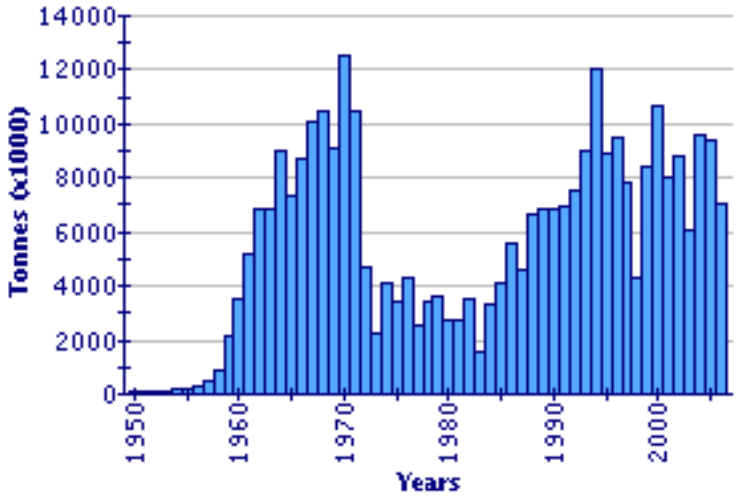

Fig. 9 Peru fish production (FAO Fishery Statistic)
Source : FAOSTAT (2006)

Table 6 Peruvian Exports of Fish and Shellfish

($1,000)

	2001	2002	2003	2004	2005
Fish, fresh, chilled, and frozen	85235	56149	40727	61838	72262
Fish, dried, salted, and meal	6199	5584	5616	6273	8440
Crustaceans, fresh, chilled, and frozen	71778	85251	113685	149420	190500
Prepared, preserved fish and Crustaceans	43228	25398	45838	60728	55510
Animal Feed Stuffs (total, largely fishmeal)	858881	848032	769396	990182	1190444

Source : UN ITC - Unit : $1000

Tariff barriers to most of the products of this group are relatively low, particularly in the United States and the EU, important markets that are covered by new trade agreements. The United States imposes MFN (Most Favored Nation) tariffs on fish of 0 to 35 percent, with an average of 20 percent for the sector. The highest tariffs are applied to processed tuna. All products in the sector except for processed canned tuna are duty-free under tariff preference programs.

Under the U.S.-Peru Trade Promotion Agreement, the United States agreed to consolidate all tariff preferences into final tariff elimination schedules. This means that all fish imports from Peru except for two canned tuna tariff lines receive duty-free treatment. For these three lines, the tariffs will be reduced to zero by 2019.

Sanitary restrictions on imports vary considerably depending on trading partner and on the source of the fish, including coastal fisheries, inland fisheries and aquaculture. For example, a control plan for heavymetals, contaminants, and pesticide and veterinary drug residues must be in place in an exporting country for aquaculture product imports to be accepted by the EU.

6 Free Trade Agreements for Agricultural Products

6.1 Overall status of FTAs

In the 1990s, Peru began to export more products, while opening its market to the entry of inputs and capital goods needed for productive sectors to guarantee their competitiveness and specialization.

At that time, Peru began to use some trade preference systems that countries like the United States and those in the European Union offered to countries like Peru. These preferences allow Peruvian exports to avoid tariffs or im-

port taxes when entering those markets. However, although the programs were very good, and Peru took advantage of them each year, these systems did not benefit all products. Some had short terms or conditions and complicated procedures that made it difficult for Peruvian producers to use them. Peruvian exports continued to rise, but it was not certain that these trade preferences would continue forever; this prevented Peruvians from starting larger and longer-term projects to export to the world.

Thus, to consolidate the access that their products already had, Peruvians decided to negotiate tradeagreements with countries to which they exported the most and still export to today. With these agreements, all the export benefits that Peru had would not be temporary or limited in coverage but would be consolidated into trade agreements that complemented multilateral processes and regional integration. These agreements are not just commitments regarding trade in goods but also include provisions regarding services, intellectual property, investment, and others that develop a diverse supply of goods and quality services and add value to Peruvian products. Today,Peru has trade agreements that open the main markets of the world, those where millions of consumers know, appreciate and enjoy the products and services that Peru has to offer.

6.2 Agricultural external trade

At the end of the first half of 2011, the FOB value of agricultural exports reached U.S. $1,661 million, 36.5% (U.S. $ 443.7 billion) greater than that obtained during the same period of 2010.

The result was achieved based on a 13.3% increase in the volume of products shipped abroad (113,500 tons), obtaining the best export prices for major agricultural products such as cochineal carmine (68%), coffee (62%), brown sugar (47%), paprika (29%), avocados (29%), prepared asparagus (17%) and evaporated milk (15%), as well as increased domestic production and export of coffee, asparagus, avocados, grapes and mangoes encouraged by increased international demand.

In the first six months of 2011, the FOB value of non-traditional agricultural exports reached U.S. $1,346 million, accounting for 81% of the total exports by the sector, which grew by 32% over the same period in 2010. This result was achieved based on increased exports of asparagus (21%), mangoes (62%), fresh grapes (54%), avocados (41%), paprika (50%) and cochineal carmine (125%), among others.

Traditional exports reached U.S. $315 million, representing 19% of the sector and an increase of 60% over the first half of 2010; this result was driven primarily by higher coffee placements (81%). Sugar exports decreased by 42.8% to U.S. $18.7 million from $32.7 million last year. During the first six months of 2011, coffee accounted for 89% of traditional exports, and sugar accounted for 6%.

Between January and June 2011, the CIF value of agricultural imports grew to U.S. $511.9 million, a 35.8% increase over that acquired in the same period of 2010 due to the steady increase in CIF prices for the main imports of raw materials as inputs for domestic industry.

The major sources of agricultural imports were 80 countries, three more than in 2010. The United States, Argentina, Chile, Paraguay, Canada and Bolivia were the main suppliers, accounting for 75.7% of the total.

The markets that recorded the most dynamic sales for the first six months of 2010 were Argentina (U.S. $258 billion), the United States (U.S. $97.9 billion), Paraguay (U.S. $62 billion) and Guatemala (U.S. $22 million).

6.3 Agricultural trade between South Korea and Peru

Diplomatic relations between Lima and Seoul were formalized in 1963. South Korea exports a significant amount of manufactured goods to Peru, and the country imported seafood and natural resources. In 1990, global trade with Korea was valued at $83 million, and this increased to nearly $360 million in 2000, making Korea the third largest trading partner of Peru in the Asian region. Recently, Korean companies have made numerous direct investments focused on energy development in Peru.

The Free Trade Agreement between Peru and Korea was signed on March 21, 2011, in Seoul, Korea. This Agreement is effective from August 1, 2011, and includes the following topics: National Treatment and Market Access for Goods, Rules of Origin and Origin Procedures, Trade Remedies, Technical Barriers to Trade, Customs Procedures and Trade Facilitation, Cross-Border Trade Services, Telecommunications, Temporary Entry for Business, Financial Services, Investment, Electronic Commerce, Intellectual Property, Competition Policy, Public Procurement, Cooperation and Trade Capacity Building, Education, Environment, Dispute Settlement and Institutional Issues.

The Korea-Peru FTA seeks to strengthen trade relations and creates a framework and favorable conditions for trade and investment between both countries, enabling control and security tools for theinvestors of both parties as well as the two states involved, which will assist in the development of more investments in the short, medium and long

terms.

The Peruvian schedules for the FTA were as follows:

- Products such as dairy, meat and sugar, amongothers, were granted relief for more than 10 years. Rice and products including rice were excluded from the negotiation.
- Products of interest in Peru, such as coffee, asparagus, camu camu, fish oil, copper, lead, zinc, fine hair yarn, and cotton shirts, among others, were to enter into the Korean market free of tariffs within 3 to 5 years
- Peru offered immediate relief and 5 years for products of interest to Korea, such as cell phones, computers, televisions, rolled steel or iron products, various electronics, and others.
- Peru could continue to apply the Price Band System.
- Peru maintained indefinitely the possibility of Drawback. The goods produced in free zones would benefit from this Commercial Agreement.

The Korean schedules for FTA were as follows;

- Korea offered total relief of its tariffs for 100% of Peru's exports.
- Korea excluded 107 tariff lines that involvebilateral trade, including some agricultural products such as beef, dairy, garlic, apples, ginseng, pears, barley and some food preparations.
- Korea may not introduce or reintroduce export subsidies on agricultural products

7 Conclusion

7.1 Discussions

The Peruvian economy grew by almost 6% per year during 2002-2010and had a stable exchange rate and low inflation. Peru's economy reflects its varied geography. Abundant mineral resources are found in the mountainous areas, and Peru's coastal waters provide excellent fishing grounds.

After the liberalization of the economy in the 1990s, the environment that surrounds the agricultural sector in Peru has significantly changed. As a result, in some sectors of agriculture, especially in the coastal region, modernized intensive production of export crops was introduced, and production has expanded.

Peru did not maintain a consistent agricultural policy because of uneasy political changes. This sometimes has negative effects on agricultural development. Peru is currently a constitutional republic with a civil law system, and this is restoring foreigners' confidence in investment and trade. Peru's exports reached $26.6 billion in 2009, and Korean companies have recently made numerous direct investments focused on energy development in Peru.

The Korea-Peru FTA seeks to strengthen trade relations and creates a framework and favorable conditions for trade and investment between both countries. This favorable trade system will create business opportunities in the agricultural sector of both countries. We expect that Korea, a resource- poor country, can make a positive advance into Peruvian agriculture to break through the current economic stalemate in Korea. Agribusiness opportunities are not ready-made, but should be developed and created.

7.2 Business implications

The strength of Peruvian agriculture lies in the diversity of climates that make production and supply possible all year round.Peru is outstanding in its potential for agricultural production and has no problems with agricultural techniques. Peru is ready to expand and export its agricultural production with competitive price conditions if the consumer market for Peruvian agriculture is to be secured.

Peru produces high quality agricultural products under diverse climates, fertile soil conditions and abundant natural resources. It is now enlarging its agri-production areas into the Andes mountains and Amazon jungles. Peru will lead the world agricultural market in the near future and provide many business opportunities with the following implications:

First, global obesity and the recently aging populations in Asia and Europe have led to an increase in the consumption of fresh agricultural products rather than high-fat fast foods. These worldwide trends will increase the demand for Peruvian agricultural products that are fresh, healthy and organic. Currently, Peruvian agricultural products are traded for higher prices in US and European markets.

Second, another opportunity for Peruvian agriculture will arise as the world food shortage, especially in Asian countries, increases the necessity for food resource development in foreign countries. The Peruvian part of the Amazon basin forms 3/4 of Peru's territory and will be available as a base to grow food.

Third, to export agri-products on a large scale, Peru will expand its physical infrastructure, such as airports, harbors and highways. Peru also needs to expand its distribution system and develop an agricultural information system like RPC and APC. These requirements will create new business opportunities in the related industry.

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