Proceedings of AARDO International Workshop (2003)
Agricultural Technology Transfer and Its Consequences
199-211

Agricultural Extension Programs in Korea

Yeong-Cheol Cho[1]

Introduction

Agriculture has been an important industry for the Korean people and has been a way of life for, approximately, 5,000 years ago. Korea has natural scenic beauty with mountains, hills, and paddy fields. It experiences four distinct seasons in a year: a pleasantly warm spring, a hot summer, a pleasingly cool autumn, and a cold winter.

However, Korean climatic conditions are generally not very favorable for farming due to the extreme temperatures, uneven rainfall, infertile topsoil, and a lack of arable land. About 65% of the land is mountainous, and 20% of the total area (1.86×10^6 ha) is cultivated for farming. Of the arable land, 1.14×10^6 ha is paddy fields. The remaining 0.72×10^6 ha are uplands.

An average farm household occupies 1.45 ha of arable land as shown in Table 1.

While the total population has expanded with a moderate increase rate, farm population has declined since the 1960s due to rapid industrialization and urbanization. The number of farm households declined from 2.483 million in 1970 to 1.28 million in 2002. The farming population stood at 3.591 million people in 2002, or about 7.5% of the total population of 47.640 million.

As the economy grows and becomes industrialized, non-farm sectors have pulled much labor from the farm sector, and the trend of labor shortages and the price of farm labor have both dramatically increased. Agriculture in Korea still plays an important role in the national economy, although it accounts for only 4.0% of the GNP; however, the importance cannot simply be explained in statistical terms because of multifaceted functions of agriculture in the total welfare of the nation including its contributions to the environment.

During the recent period of economic development, agriculture greatly contributed to achieving rapid economic growth by providing cheap foodstuffs, a diligent workforce, and capital accumulation. The basic standard of living in terms of material affluence has substantially risen due to increased production. However, in spite of the merits of industrialization, it has been a mixed blessing, producing both products and pollution at the same time.

---

1 Evaluation & Planning Task Force, Rural Development Administration
E-mail: choyc@rda.go.kr

Table 1. Cultivated area, farm population, number of farm households, average size of land holdings, and average size of farm families (1960~2002)

Year	Cultivated area (10^3 ha)	Farm population (10^3 people)	No. of farm households (10^3)	Average farm size (ha)	Average farm family size (people)
1960	2,205	14,559	2,350	0.86	6.2
1965	2,275	15,812	2,507	0.91	6.3
1970	2,295	14,432	2,483	0.93	5.8
1975	2,240	13,244	2,379	0.94	5.6
1980	2,196	10,827	2,155	1.02	5.0
1985	2,144	8,521	1,926	1.11	4.4
1990	2,109	6,661	1,767	1.19	3.8
1995	1,984	4,883	1,499	1.30	3.3
2000	1,888	4,032	1,384	1.36	2.9
2002	1,863	3,591	1,280	1.45	2.8

Source: Ministry of Agriculture and Forestry, 1960~2002.

The Korean Agricultural Extension System

1. The Mission and Goals of Extension

1) The Mission of Agricultural Extension Services

The *Rural Development Law* describes how the objectives of the organization are to contribute to the development of farmers' welfare through conducting agricultural experiment and research, transfer of scientific techniques and knowledge on agriculture and rural life, and training of rural leaders and farmers.

The followings are specific missions of the Rural Development Administration:

(1) To conduct experiments and research for developing agricultural technology concerning food crops, livestock, veterinary medicine, horticulture, sericulture, farm machinery, etc., and for developing farm management;

(2) To transfer scientific techniques and knowledge for improving agriculture and rural life, especially through informal education and demonstrations of the effects of scientific knowledge and technology on agriculture and rural life, and through fostering rural people's organizations; and

(3) To train farmers, local leaders, rural youth students, and teachers in agricultural high schools as a part of cooperative education, as well as research and extension officials in agricultural technology organizations.

2) The Goals of Agricultural Extension Services

The efficiency of farm management for meeting the demands of competitive agriculture and substantial increases in farmers' incomes are key concerns of Korean agricultural extension services. Extension activities for agro-technology transfer in Korean are based on the following objectives:

(1) To attain stable and labor-efficient production of major grain crops;
(2) To improve the quality and cost-efficient production of cash crops and livestock;
(3) To maintain safe and pollution-free crop production and adequate pest management;
(4) To create extra revenues by exploiting high-tech agriculture;
(5) To provide technical support for the production of special local or export markets; and
(6) To develop sustainable agriculture.

To accomplish the above goals and objectives, the area-specific model projects for higher incomes and new technologies have been implemented at the national as well as regional level.

2. Agricultural Extension System

1) Organizational Set-up

The Rural Development Administration (RDA) is the central government organization for agricultural research and extension services. It was first established in 1906 as the Agricultural Demonstration Station, and subsequently renamed the Agricultural Experiment Station in 1929, the Institute of Agricultural Improvement in 1947, and the Institute of Agriculture in 1957. It was re-organized as the Office of Rural Development (ORD) in 1962, and, it was re-constituted in 1994 in its present form of the RDA by incorporating four national offices from the Ministry of Agriculture and Forestry (MAF). The organizational structure of RDA is presented in Fig. 1.

The Rural Development Administration (RDA), an outside arm of extension and research of the MAF, is the national-level headquarters for rural development planning and implementation in Korea. Headed by an administrator, the RDA maintains various extension programs through one bureau and two offices: the Extension Service Bureau, the Farm Management Office, and the Public and Technical Information Office. There are four divisions under the Extension Service Bureau.

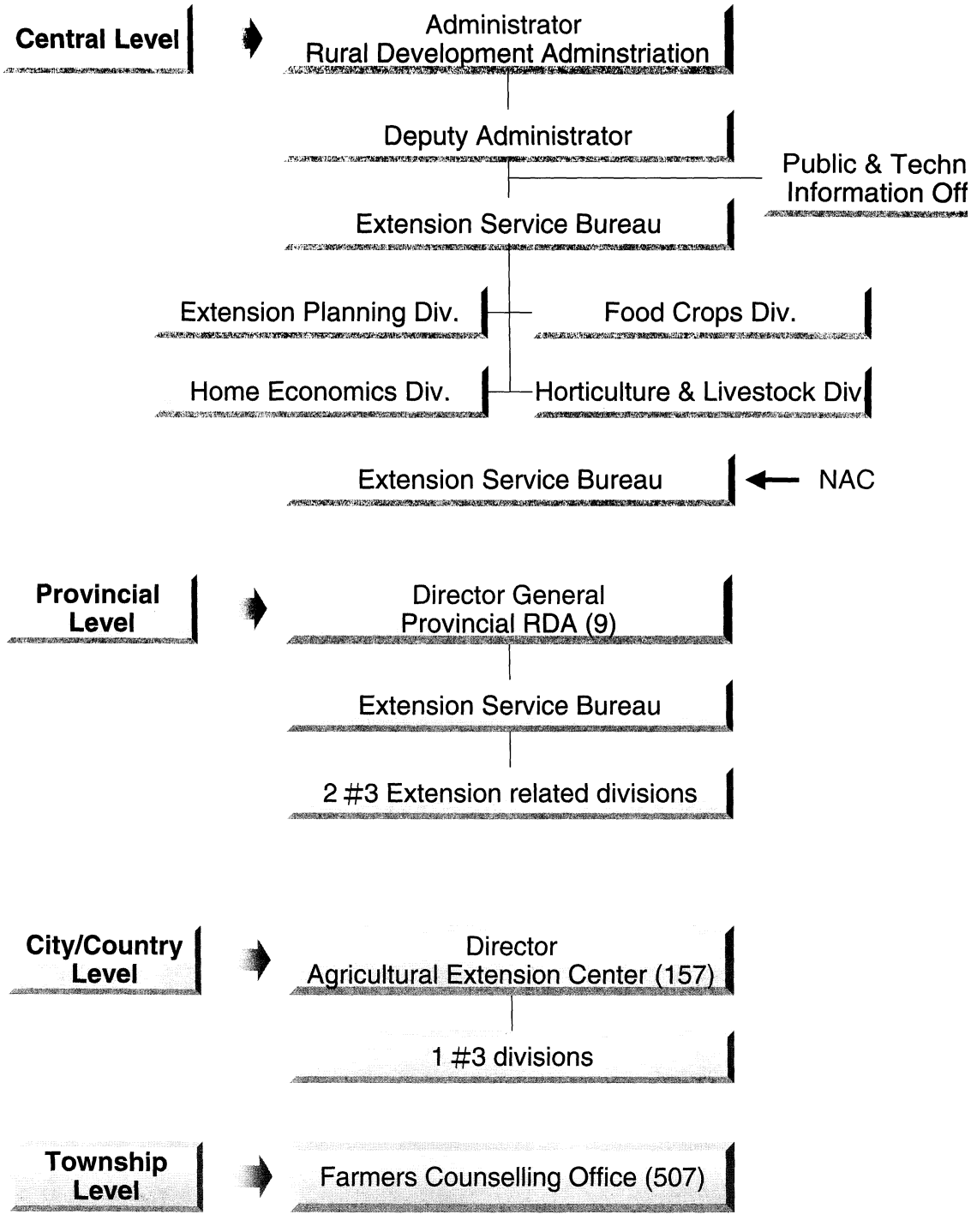


Fig. 1. Organization for agricultural extension services

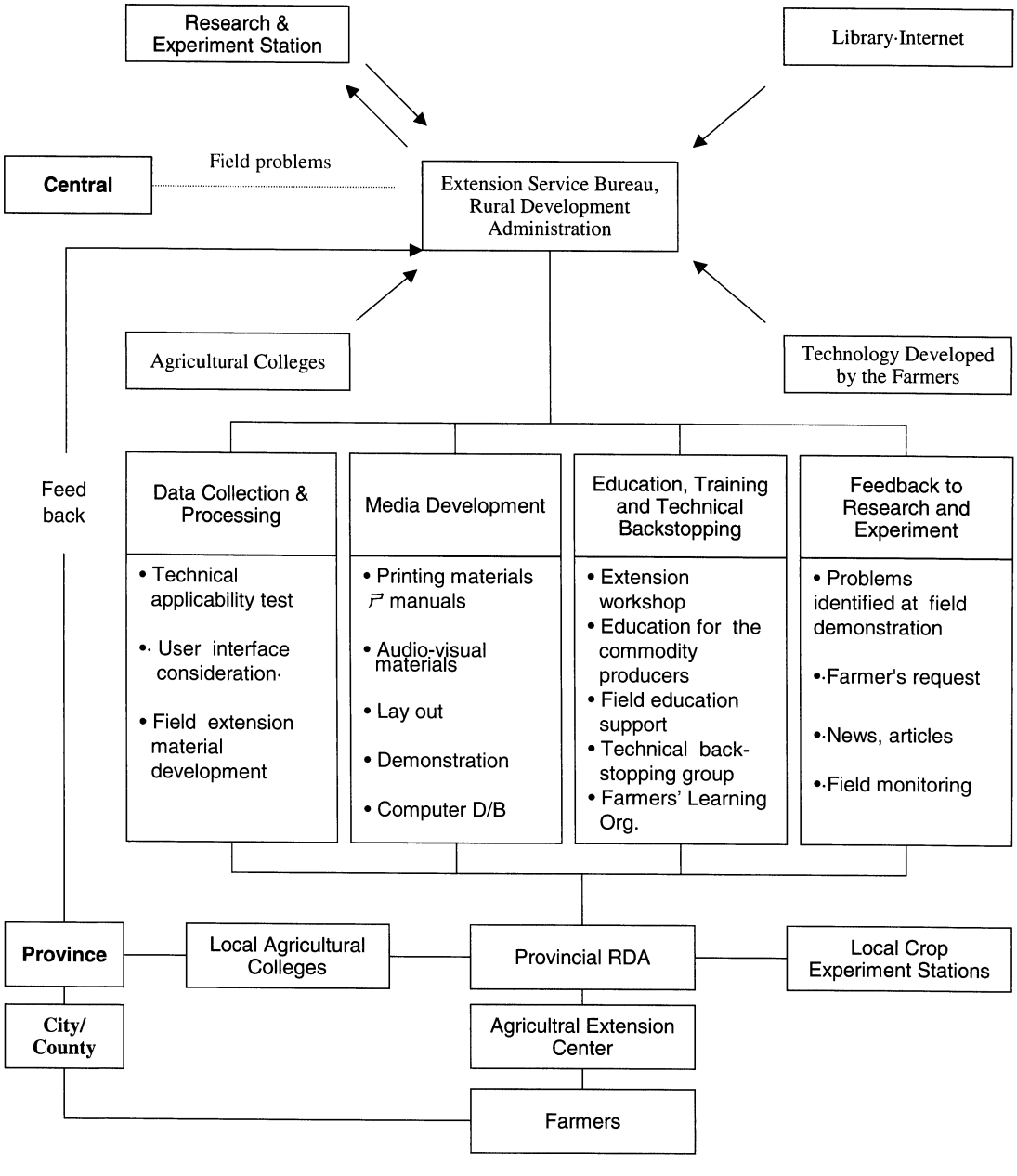


Fig. 2. Technology transfer system for extension

As shown in Fig. 2, in the Extension Service Bureau, the Extension Planning Division is responsible for budgeting, personnel management, national extension activities as well as integrated community-based rural development, while the Home Economics Division is responsible for matters related to rural welfare. Other divisions, which are staffed by production-oriented specialists, have two subject-matter divisions namely the Food Crops Division and the Horticulture and Livestock Division.

The Farm Management Office supports both research and extension of farm management and computing services with its two divisions. The Public and Technical Information Office, popularly known as the "Agricultural Information Center", is responsible for all information services of the RDA, particularly the preparation, production, distribution, and utilization of extension teaching materials. The Technical Training Division which was moved to the National Agricultural College of the RDA in 1999 is responsible for training extension workers and farmers throughout the country.

The Provincial Rural Development Administrations (PRDAs), numbering nine in all, represent the provincial organization of the RDA, and the PRDAs are the outside arms of the provincial government and are consequently controlled administratively by governors.

The 157 City/County Rural Extension Centers are administratively and technically under the hierarchical control of the PRDAs. But at the same time, each extension center forms an outside arm of its respective city/county government. The County Extension Center, however, is considerably dependent on the county government in many ways, including financing, which is probably the most important aspect of agricultural extension work.

There are real grass-roots extension organizations under the jurisdiction of the county extension offices called "Farmers Counseling Offices" totaling 507 across the country at the township (*Eup/Myun*) level. Each office is geographically responsible for extension programs. These local extension offices make plans and carry out localized programs, and at the same time execute national extension programs financed by the national government.

2) Characteristics of the Organizational Set-up

Characteristics of the organizational system can be summarized as follows.

(1) Since both research and extension functions are integrated under the same administrator of the RDA, the results of agricultural research and experimentation and of newly developed technologies can be more effectively and efficiently disseminated to farmers in a timely manner through the nationwide extension channels and networks. Problems which occur in the course of extension activities can be easily adopted as research projects.

(2) Results of research are thoroughly examined, screened, and subjected to economic analyses by the research and extension joint evaluation committees. These results are reflected in agricultural policies and extension services. Related extension specialists are always aware of current on-going research programs and actively participate in research planning and evaluation activities.

(3) The participation of researchers in extension programs is not only helpful for technical dissemination but also provides very useful information for improving agricultural research programs. Researchers have opportunities to review the applicability of their research findings in the field through their involvement in extension activities such as field observation trips, training programs for farmers, evaluation meetings, etc.

(4) The institutional cooperative relationship of the extension service system with provincial and local governments, generally known as general administrative agencies, is another characteristic. With this relationship, extension programs are not only easily integrated into comprehensive rural development policies, but also supported from the administrative agencies.

(5) In addition, this close cooperative relationship exists between the extension program and administrative policies at all levels, and the budget for agricultural extension services comes from central, provincial, and city/county governments in collaboration with each other.

Figure 3 shows the linkages of research and extension for agricultural technology transfer in Korea.

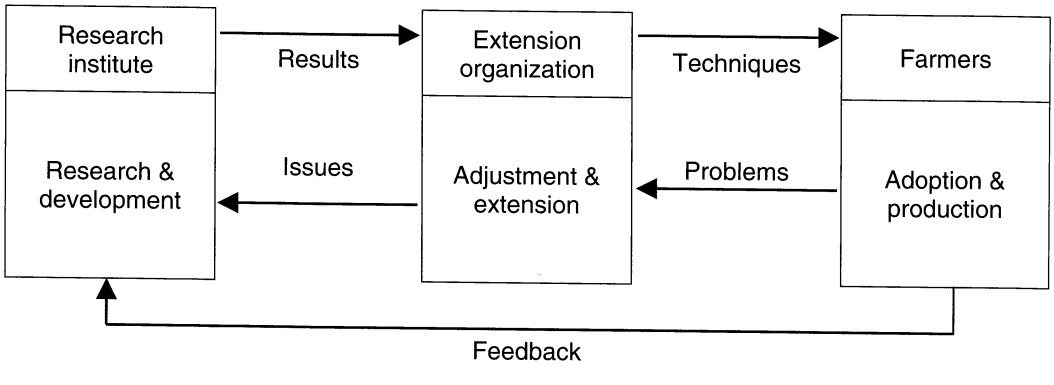


Fig. 3. The Linkage of Research and Extension (Source: Rural Development Administration).

3. Extension Agencies, Personnel, and Budget

1) Extension Agencies

Numbers of extension agencies included 181 at the city/county level and 1,464 at the township (*Eup/Myun*) level in 1987; however, the numbers of extension offices were respectively reduced to 157 and 507 in 2002, a year after localization was implemented as shown in Table 2.

Table 2. Number of extension agencies by selected year

Year	Central	Provincial level	City/County level			Township offices	Remarks
			Total	City	County		
1987	1	9	181	42	139	1,464 (22)	A year before the 1988 Seoul Olympics
1994	1	9	182	46	136	1,302 (28)	Preparation for localization
1997	1	9	162	69	93	1,415 (9)	Implementation of localization
1998	1	9	157	67	90	534 (18)	
2000	1	9	157	67	90	527 (9)	
2002	1	9	157	67	88	507 (9)	

Source: Rural Development Administration.

2) Extension Educators

Extension educators are central or local government officials, and the administrator of the RDA used to take charge of the local extension personnel administration, directly or indirectly, including appointments, positioning, and promotions. However, since 1997, most personnel affairs have been managed by the governor of each local government.

The number of extension educators has steadily increased to reach 7,979 by the end of 1990. After localization of extension services in 1994, administration authority was transferred from the central to local governments. Again in 1997, the government decided to change the nomination right of field extension personnel from the central to local governments. At present, there are 4,728 extension officials throughout the country, as shown in Table 3.

Table 3. Changes in number of agricultural extension educators in selected years

Year	Total	Central	Provincial	City/county	Remarks
1962	3,173	75	180	2,918	Enactment of the *Rural Development Law*
1970	6,360	73	236	6,051	Rice and barley guidance
1981	7,979	105	226	7,648	Farm income guidance
1997	6,839	91	289	6,459	Implementation of localization
1998	5,545	85	241	5,219	1st restructuring
1999	5,032	71	235	4,726	2nd restructuring
2002	4,728	71	228	4,429	

Source: Rural Development Administration.

There were 71 extension educators at the national level or at the RDA, mostly senior subject-matter specialists, in 2002. There were 228 extension personnel at the nine provincial RDAs, and 4,429 extension educators stationed at the 157 county extension offices.

Percentage-wise, approximately 6% of the total numbers of extension personnel are stationed both at the national-level (RDA) and at provincial-level agencies. The remaining 94% of the total extension personnel work directly with rural people, being stationed at the local level of either county extension offices or their branch offices. An extension educator covers eight villages of the lowest administrative unit with 289 farm households and 420 ha of farmland on average.

3) Extension Budget

Experience has shown that in allocating operational authority and responsibilities, subsidies are key decisions which should devolve to the lowest possible level of government, consistent with the efficient use of funds. All levels of government must be willing to involve farmers and other stakeholders in project planning, design, and implementation. Furthermore, funding must follow function: local authorities must have resources commensurate with their added responsibilities.

Recent trends in sustainable agriculture as defined as ecologically sound, economically viable, and socially just and humane; have received considerable attention in recent years from environmentalists, agriculturalists, and consumers. Extension services need more funding and greater manpower to meet emerging needs of environmentalists, agriculturalists.

and consumers; however, the extension budgets by year, especially after localization in 1997, do not reflect these needs as shown in Table 4.

Table 4. Extension budget by year

Year	Budget	Source				Remarks
		National		Local		
		Amount (10^6 Won)	%	Amount (10^6 Won)	%	
1991	112,735	11,897	10.6	100,838	89.4	
1992	131,421	14,160	10.8	117,261	89.2	
1993	145,090	17,867	12.3	127,223	87.7	
1994	207,275	20,691	10.0	186,584	90.0	
1995	285,600	92,600	32.4	193,000	67.6	
1996	360,128	90,975	25.3	269,153	74.7	
1997	432,894	97,614	22.5	335,280	77.5	Localization
1998	263,918	82,177	31.1	187,741	68.9	
1999	258,615	91,173	35.3	167,442	64.7	
2000	240,878	85,260	35.4	155,618	64.6	

Source: Rural Development Administration.

4. Agricultural Extension Programs

1) Food crops: rice, barley, soybean, etc.

Improvements in soil fertility, fertilizer use, and environmental-friendly agriculture.

Pest forecast and control, and integrated pest management.

Plant protection from meteorological calamities.

2) Cash crops: vegetables, flowers, fruits, and special-purpose crops.

Greenhouse cultivation, environmental control, tissue culture, low-input sustainable agriculture, and pollution control.

3) Livestock

Animal husbandry and livestock sanitation.

4) Home economics

Home management, development of rural women's ability, home environment, and nutrition.

5) Fostering of future farmers

4-H club members and farmer successors, rural leaders, and women.

6) Extension personnel training

Extension workers must have highly specialized knowledge, newly developed techniques, and experience. Through continual professional training, they must be able to carry out more-effective and productive extension services for farmers. The RDA has therefore made continual efforts towards these needs through in-service training, workshops at advanced pilot farms, professional training, and overseas training according to the *Regulation on Specialization of Extension Personnel*.

7) Farming training programs

Various year-round training programs at the national, provincial, and county levels are furnished to farmers to improve their farm management and production skills including commodity-specific technologies and machine operation. Intensive rural education on a nationwide scale is delivered during the winter season of January and February, which is not a busy time for farmers, whereas during summer, regular technical lectures on region-specific commodities are organized jointly by the RDA and the Korean Broadcasting System.

The Korea National Agricultural College of the RDA has provided a 3-year specialization course to future elite farmers since 1997.

Impact of Technology Transfer on Economic and Sociocultural Life

1) Agricultural extension programs as a way to create a foundation for social development and increased farm incomes

In the latter part of the 1950s when the agricultural extension program was adopted for the first time, the program instituted a democratic extension method compatible with the given sociocultural environment of Korea along with the general enlightenment of discouraged and poverty-stricken rural people due to the havoc of the Korean War, to bring them new hope and encouragement.

In the 1960s less-susceptible traditional farmers began to apply modern scientific farm techniques obtained from extension programs to their own farming. Rural housewives awakened from traditional doldrums and began to learn rationalization of rural lifestyles as well as home improvement and strived to raise their social status by means of cooperative activities in their community. In the meantime, a corps of young rural people developed the leadership abilities to grow into able future farmers through the 4-H program. Thus, the foundation of the agricultural extension program was firmly laid during this period of time.

In the decade of the 1970s the extended diffusion of newly developed high-yield rice breeds eventually revolutionized farm technology on the one hand, while cooperative farming generalized by means of cooperative production on the other, markedly raised productivity. Recognizing the advantages of scientific farming through experience in cultivation of new breeds, farmers have come to willingly apply new techniques not only to rice farming but also to other fields of farming in pursuit of extended farm production. Particularly, the progressive consciousness possessed by advancing farmers and continued improvements in farm know-how owing to extension programs have consequently produced tremendous impacts on the successful implementation of rural development.

In the 1980s, consumers with greater bargaining power, which had improved with the national economy, were searching for quality vegetables and animal productions; the agricultural extension program responded to farmers with arrays of diverse vegetables and animal production even in the off-season.

As a result of agricultural extension programs, farm earnings have steadily grown 11% to 15% annually. An average farm household income was US$ 3,847 in 1980, jumped to approximately US$ 20,000 in 2001. Agricultural income comprised 47% of total farm household income in that same year.

In this way, agricultural extension programs have established a strong foundation for sustained rural development as a whole by fulfilling a social education function aimed at the development of human resources, particularly of the rural poor over the past decades.

2) Returns on investment of extension services in Korea

One study indicated that the socioeconomic returns were quite competitive in cases of agricultural research with a 44.82% internal rate of return and were very high in cases of extension services with a 207.82% internal rate of return.

Agricultural production responds to agricultural research shocks about 4 years after a shock occurs. The magnitudes of the impacts increase until a peak is reached 9 years after the initial expenditures, and then the impacts decline to a negligible level after about 20 years. These lag times are consistent with the usual literature on this research, which reports lags of 7 to 30 years.

Agricultural production immediately responds to an agricultural extension shock and declines to a negligible level after about 4 years. Thus the lag times are much shorter than those from research shocks.

To develop the agricultural sector, the Korean government must invest more in the agricultural extension sector as well as in research.

Future Tasks and Directions

Since the early 1990s, farmers in Korea have realized the fact that increased production might not lead to increased incomes. Because of this, farmers desired improvements in management and marketing. Extension services identified the changed needs of farmers for new knowledge, information, and technology in their farm business operations including management and marketing. And extension educators have begun to emphasize cost-down production through efficient mechanizations which may solve labor shortages, low-input techniques such as reduced chemical application to protect the environment, and water-conserving culture to prevent development of losses.

Increased cooperation among the central, provincial, and local levels of government after localization of extension services in January 1997 should be strengthened. Provincial-level monitoring and supervision should be enhanced for more-effective agricultural extension services to meet the changing needs of farmers in the future.

Finally, we must consider consumers' needs for food safety and good quality as the final clients of agricultural extension services.

References

1. Kim S. S. Localization of extension educators in Korea. Kor. J. Agric. Ext. 2001. 8(2): 293-314.
2. Kim S. S. A system approach to the linkages among agricultural research, extension and farmers in Korea. Kor. J. Agric. Educ. 1999. 31(2): 61-84.
3. Kim S. S. Problems in localization of extension educators in Korea. Kor. J. Agric. Ext. 2000. 7(1): 247-254.
4. Kim J. G. Agricultural extension organizations and programs, International Training Program. Suwon, Korea: Rural Development Administration. 2001.
5. Kim S. S, Cho Y. C. Directions for personnel management of agricultural extension services in Korea. Kor. J. Agric. Ext. 1995. 2(2): 175-189.
6. Yang S. C, Choe Y. C. Directions for the implementation of agricultural extension services in an age of localization. Kor. J. Agric. Ext. 1995. 2(2): 147-162.
7. Song Y. S, Choi M. H. Decentralization of agricultural extension services in Korea. Kor. J. Agric. Ext. 1995. 2(2): 163-173.
8. Choi M. H, Choe Y. C. Returns to investment on extension service in Korea: Implications for the structural change. Kor. J. Agric. Ext. 1995. 2(1): 1-21.