

AN OVERVIEW OF AGRICULTURAL EXTENSION SERVICES IN TURKEY

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Abstract

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In the study, public extension service is examined through data collected from 538 extension workers in nine agricultural provinces of Turkey. Turkish extension service is influenced by the general top down and training-visit approaches which were employed in the past. These approaches are mainly directed to conventional production and yield increase, by using a top-down process that gives little place for human resources development and sustainable agriculture. New opportunities of digital devices such as cell phones, internet, and e-mail are generally underutilized in farmer training. The local participation is not at intended level during the formulation of extension activities in Turkey.

Key words: agricultural extension, extension methods, agricultural technology transfer

Introduction

Agriculture takes a considerable part in Turkish economy with a 9% share in GNP, 29.5% share in employment, and 4.25% share in the export value. Historical roots of agricultural services in Turkey go back to middle 1800's (Anonymous, 1938). Public extension activities in Turkey are dominated and conducted by Ministry of Agriculture and Rural Affairs (MARA) with its structure spread in provinces as 81 dependent directorates and 802 county directorates. The structure of the MARA, which was reshaped in 1991, serves about 7 000 000 farmers with 6965 agricultural engineers, 2441 veterinarians, 3828 agricultural and 1819 veterinarian technicians, and 908 home economists. The public agricultural extension service is expected to act as a central mechanism in the rural development process.

Agricultural extension has largely contributed, during the past century, to agricultural production and development, all over the world. Agricultural extension also has an important role in the international trade competition, because of the today's knowledge based globe (Van der Bor et al., 1995; Csaki, 1999). The recent developments encourage the local participation, decentralization; client oriented and digitalized structures in extension services.

Materials and Methods

The research has been conducted in nine provinces (Adana, Bursa, Erzurum, Konya, Malatya, Manisa, Samsun, Sanliurfa and Usak) selected from each agricultural region in Turkey (Table 1). Involved provinces represent the different regions possessing different ecological and agricultural structures. During the study, two types of questionnaires were used to collect the institutional and individual data from

Table 1
Respondents by Regions and Provinces

Research area		Extension staff	
Regions	Provinces	No.	%
Mediterranean	Adana	27	5.0
Marmara	Bursa	62	11.5
North East	Erzurum	55	10.2
Central East	Malatya	63	11.7
Aegean	Manisa	78	14.5
Central North	Usak	56	10.4
Black Sea	Samsun	116	21.6
Central South	Konya	40	7.4
South East	Sanliurfa	41	7.6
Total		538	100.0

organizations and extension workers. 538 extension workers from the provincial extension services participated in the research, between 2006 and 2007. All field level technical staff, such as agricultural engineers, veterinarians, agricultural and veterinarian technicians and home economists, which work to enhance the living standards of rural people, were identified as extension worker in the study.

Frequency, cross-tabulation, chi-square, t-test, Likert scale and factor analysis were employed for interpreting the data in the study. Chi-square statistic used to test the statistical significance of the observed association in a cross-tabulation. It assists us in determining whether a systematic association exists between the two variables. Factor analysis a class of procedures primarily used for data reduction and summarization (Malhotra, 1996). Some personal characteristics of extension workers such as age groups (lowest through 40 and 41 through highest); gender groups (male and female) and education groups (faculty graduates and others) were used for comparing the extension workers. Factor analysis was used for classification of extension media/methods, and also the extension problems in the study. Besides these mentioned statistical methods Likert scale with a score ranging between 1 and 5 was also used for evaluating of some variables in this research.

Results and Discussion

Staff numbers and some agricultural indicators of the provinces

The level of extension coverage, as measured by the ratio of extension worker to farmers, widely differs according to countries and regions of the world. The worldwide average was about one extension worker for every 2000 economically active people in agriculture. It was estimated that there were approximately 800 000 extension workers and 80% of them worked in public extension organizations. An extension worker had to serve 3000-8000 farmers in developing countries, and less than 400 farmers in developed countries. It was supposed that extension organizations were able to reach only 10% of their clients in the world (Anderson and Feder, 1999; Swanson et al., 1989).

In the nine provinces of the research area, 798 127 farmers cultivate about 7.2 million ha, in 141 counties and 5851 villages. Average farm size is calculated as 10.2 ha. According to the findings, each extension worker should serve 437 farmers and 496 hectares of land, while there is one veterinarian/technician for 9730.4 cattle and sheep.

Extension expenditures

Well-managed extension systems with adequate funding give relatively high rates of return on the financial investment.

Optimally, it is suggested that 40% of an extension's budget should go for operational costs such as traveling, teaching aids, publications, and field demonstrations. In 1990s the extension expenditure per farmer was US\$ 65 in developed countries and only US\$ 2-3 in developing countries (Feder et al, 1999; Swanson et al, 1989). Extension and research expenditures in EU Countries are higher than US\$ 150 per farmer (DPT, 2003; Boyaci, 1996).

In our study, annual extension (e.g. field trials, demonstrations, visual aids, etc) and ICTs (information and communication technologies) expenditures per farmer was calculated as US\$ 1.6 and US\$ 0.36, respectively. By taking into consideration the total budget of the extension organization, the figure allocated per farmer reached US\$ 49.2. This figure contains all expenses related with extension organization and its services such as salaries, traveling, heating, repairs, etc. On the other hand, regular in-service training, a significant component of information society, has a limited share within the extension budget. The organizations annually spend US\$ 10.4 per extension worker for in-service training activities in Turkey.

Some characteristics of extension staff

Age, education level, in-service training attendance, and occupational experience affect the performance of extension workers (Boyaci, 1998; Expere, 1974). The proportion of female extension personnel is considered inadequate. In 1988 only 13% of extension personnel worldwide were estimated to be women with regional differences (FAO, 1990). According to our findings, in Turkey the average age of an extensionist is 39.9, 25.2% are women and 61.2% have personal farming experience. Education levels of the extension workers are summarized in Table 2. More than half of the extension staff graduated from agricultural faculties. Most of the vocational high school graduates also attended two-year vocational programs at universities. Also, 14.5% of the extensionists have a master's degree and 1.7% has completed their PhD studies.

The dynamic process of development requires institutional and individual transformations. Regarding this aspect,

Table 2
Educational level of extension workers

School	no.	%
Agricultural Faculty	278	51.7
Veterinary Faculty	47	8.7
College	22	4.1
Vocational High School	9	1.7
Other	182	33.9
Total	538	100.0

Table 3
Some personal characteristics of extension workers (T test)

	Groups	No.	Average years	Standard deviation	Degree of freedom	T value	Probability of significance	
Age	Education	Faculty	323	39.4	7.129	499	2.570**	0.010
		Others	178	41.1	7.526			
	Gender	Men	399	40.8	7.599	531	5.330***	0.000
		Women	134	37.0	5.522			

*** <0.01 ** <0.05.

individual differences between age groups reflect the changing profiles of the staff. Levels of education and numbers of women among the extension workers have increased within the years (Table 3).

Today, ICTs have important functions in agriculture like in other sectors. For this reason, extension staff should be equipped with ICTs, and have good foreign language abilities for digital applications (Trindade, 1999). For instance, 67% of personnel in some Middle Eastern countries have shown their insufficient English abilities as the reason of their lack of connection to the internet and the knowledge networks (UNDP, 2003). Foreign language knowledge is low among the extension staff in Turkey: 47.2% of the staff is not able to speak any foreign language and only 5% of staff declares an advanced level of knowledge for a foreign language.

Time allocation

Extension staff should devote all their working time exclusively to extension activities. They should not be assigned regulatory or administrative duty. In this context, the number of farm visits and time spent for extension activities are important indicators for performance evaluation in extension organizations. The number of farmers covered by an extension worker varies considerably from place to place, along with the density of population, roads, the intensity of cropping, and the diversity of crops grown. For example, more than 100 farm visits (Expere, 1974), or 8-20 farm visits in a week (TOKB, 1987) are reported by different sources. Extension workers in European Union member states spent 75% of their working time for farmer training activities (Boyaci, 1996). According to our findings, extension workers are responsible for an average of 5.1 different crops, spend 9.3 days per month for farm visits; devote up to 40% of their time for farmer training, and during all these activities they travel 501.2 km per month.

Targeted topics and groups

The initial focus of extension services in all countries as well in Turkey was the improvement of basic agricultural

practices such as quality seeds, agronomic practices, plant protection, fertilization, animal health, etc. These contents remain the same also today. Our research shows that the priorities of extension workers have not changed and they can be summarized as production and yield increase (60.7%), quality improvement (14.1%), reduction of cost (8.1%), farmer organizations (5.8%), environment (4.5%), alternative crops (3.2%), marketing (3.2%), and others (0.3%). Human resources development or other related topics still receive very little attention by the public extension service in Turkey.

Furthermore, although 80% of the Turkish farms are small (Miran, 2006), the extension activities are usually directed towards the large and medium scale farms. Average education of farmers involved in extension activities was calculated as 5.8 years. Middle age and male farmers are indicated as the more frequent target groups.

One of the evaluation criteria utilized in evaluation of extension is the adoption rate of advice by farmers (Engel, 1990). Investments on extension can be financed by adoption of innovations/advices. According to our respondents, only 42.7% of the farmers accept the received advice. Traditionalism, low education levels and insufficient information of farmers were mentioned by extension workers as the reasons for such low adoption levels.

This relatively low rate of adoption can be explained also with the prevailing top down approach that still characterizes the Turkish agricultural administration. As a matter of fact, several approaches can be found in the management of extension services (Axinn, 1988). The approaches guide the objectives, programs, clients, linkages, methods, and the financing of the different extension services. In the past and still today, in many cases the Ministry of Agriculture and the National Research Institutes have directed the priorities and the information flows. More modern approaches are those encouraging the farmer participation in extension programs, since the first moments, as analyzers and problem definers. Their involvement helps the definition and the implementation of sustainable development policies, programs, projects and single actions (Rogers, 1993; Chambers, 1994). In our

case, 79.4% of extension workers intensively designate farmer problems via individual observations and interviews, and there is a limited farmer participation in analyzing and problem solving processes (Table 4).

Today's complicated activities and relations necessitate strong coordination among the different actors. To be relevant and responsive to client concerns requires regular feedback at each level throughout the extension systems. Unfortunately, the public dominant structure is usually restricted to collaboration with the farmer organizations and the private companies in technology transfer, priority setting and evaluation process of extension services. In the study, only 3.4% of extension staff was declared to influence the farmer organizations, on priority setting in extension.

Information sources and utilized methods in extension

Today's information age has diversified the sources of information which can be used by extension agents to keep their knowledge and skills updated. Internet based networks

have created a more sustainable information flow atmosphere. Books and internet were found as the most favorable information sources for extensionists in Turkey (Table 5).

There is an enormous confusion between the production of mass media (radio, TV, a website, books, visual aids, posters, calendars, leaflets), which are produced by the organization (or by other sources) and the utilization of them by the extension agents. However, some media replace the extension agent, while other ones strengthen their communication (visual aids).

The results of our study puts forth that face to face communication methods are intensively utilized, but digital aids have limited use. There are some weekly programs on local radio and television channels for informing farmers about farming practices. The notice boards are mostly located in public places such as coffeehouses, village administration offices. The plant protection applications are mostly declared via the notice boards in the villages. Recently, cell phones and SMS were became the important instrument for inform-

Table 4
Extension approaches (%)

Employed approaches on problem determination and solution definition	Extension workers	
	no	%
I define the problems and find the solutions	40	9.0
Farmers tell the problems and I find the solutions	107	24.3
Farmers and I jointly define the problems, and I find the solutions.	146	33.1
Farmers and I jointly define the problems and solutions.	148	33.6
Total	441	100.0
Missing value	97	

Table 5
Information sources of extension workers (%)

Sources	%
Books	37.4
Internet	33.3
Subject matter specialist in counties and provinces	8.5
Research organizations	6.4
Colleagues	6
Journals and papers	5.1
Universities	1.3
Discussion groups	1.1
Farmers	0.2
Others	0.6
Total	100

Table 6
Extension media and methods (%)

Aids and methods	%
Farm visits	59.5
Farmer meetings	20.9
Interview in the office	10.2
Interview in the coffeehouses	1.2
Brochures	2.3
Demonstrations	2.3
Radio-TV	0.2
Notice boards	0.7
Telephone	0.9
Cell phone	0.5
Loudspeaker systems	0.7
Internet	0.5
Total	100

ing farmers about plant protection applications, the weather reports in some extension services. The listed farmers regularly receive information from extension organizations via SMS in Turkey.

The internet has important potential in rural development in the near future for creating, receiving and sending information between different actors. Unfortunately, the new opportunities of digital devices are generally underutilized in farmer training (Table 6). Although digital devices might have important roles in constituting rural information societies, insufficient facilities of organizations and farmers and nonexistence of cyber culture reduce their usage in the public extension services in Turkey. Traditional communication me-

dia and methods are frequently preferred by extension workers for communicating with the farmers (Table 7). When extension methods and media are classified through factor analysis, three groups are constituted as *digital devices*; *traditional mass and group methods*; and *individual contacts* (Table 8).

The problems in extension

In developing countries, the most important problems faced by extension agents are stated as technological troubles, communication problems, lack of regular in-service training, transportation, equipment facilities, insufficient budget, top-down approaches, unsuitable messages and nonexistence of

Table 7
Usage levels of extension media and methods

Media and methods	Frequency of use					average
	never		frequently			
	1	2	3	4	5	
Farm visits	8.6	4.6	13.1	23.5	49.9	4.0
Farmers meetings	13.3	9.1	19.2	28.6	29.8	3.5
Meetings at the office	24.4	4.9	22.2	23.2	25.4	3.2
Meetings at the coffeehouses	38.4	13.3	21.4	14.3	12.6	2.5
Brochures	34.1	13.3	21.2	18.3	13.1	2.6
Posters	50.6	15.3	16.5	11.1	6.4	2.1
Demonstrations	47.4	11.9	18.8	13.1	8.9	2.2
Local radio and TV	64.9	13.1	13.8	4.7	3.5	1.7
Notice boards	50.0	14.3	14.5	11.1	10.1	2.2
Telephones	40.2	16.0	22.2	11.6	9.9	2.4
Cell phones	48.0	16.7	15.5	10.1	9.6	2.2
Loudspeaker systems	48.0	14.4	17.8	10.4	9.4	2.2
Internet	69.2	12.1	7.9	4.9	5.9	1.7
Electronic mails	77.8	11.3	6.4	2.7	1.7	1.4
Fax machine	81.2	7.9	7.4	2.0	1.5	1.4

Table 8
Classification of extension media and methods (Factor analysis)

KMO Measure of sampling adequacy	Bartlett's test of chi square	Degree of freedom	Probability of significance
0.855	2294.4***	105	0.000
Factors	Factor 1	Factor 2	Factor 3
Variables	Local radio-TV, internet, e-mail, fax	Farmer meetings, brochures, posters, interviews in the coffeehouses, demonstrations, loudspeaker systems, notice boards	Farm visits, meetings at the office
Clusters	Digital devices	Traditional mass and group methods	Individual contacts
Variables for clusters	Email, brochure; farm visit		

*** $\square < 0.01$.

farmer participation (Walter and Sarkar, 1996; Sigman and Swanson, 1993). Similar problems were also determined in our study. Low salaries, mismatching of authority and responsibility, issues related to personnel affairs, and lack of regular in-service training are found as the most important bottlenecks in the public Turkish extension service. Transportation, office and extension aids, and actor linkages were defined as other problems in the study (Table 9). When the defined problems have been ordered, two clusters (Table 10) have been formed as activities related to conducting services and personnel affairs.

Conclusions and Recommendations

Agricultural extension could provide significant contributions to sustainable agricultural development, especially under complicated and information based economy conditions.

In Turkey, although the number of farmers served by an extension worker is less than the world average, such service is still not at the intended level. An adequate and stable funding structure is not yet established to run the activities despite known benefits of extension. The profile of extension workers is changing and the numbers of young, having a post-graduate degree, and of female personnel have increased in the last years. Foreign language skills of extensionists, a criteria essential for connecting to international networks are however still limited.

Public extension agents are devoting 40% of their time for training of farmers, with first priority being conventional production and yield increase. Objectives related to sustainability are given limited place in extension advices. Furthermore, activities are usually directed towards large and medium scale commercial farms. Limited farmer participation in problem solving and lack of collaboration with other actors

Table 9
Problems affecting extension activities

Mentions, %	Problems	Negative effects on extension activities					Average
		none		very much			
		1	2	3	4	5	
46.6	Low salary level	9.0	8.3	15.8	24.9	42.0	3.8
14.1	Personnel affairs	8.2	6.7	20.0	24.4	40.8	3.8
15.9	Mismatch of authority and responsibility	16.3	7.2	22.4	21.3	32.8	3.5
10.5	Lack of regular in-service training	15.0	11.3	20.8	25.5	27.4	3.4
4.3	Lack of transportation facilities	26.6	15.1	21.9	15.7	20.6	2.9
2.5	Insufficient office facilities	27.1	13.3	24.1	17.6	17.9	2.9
1.6	Lack of extension aids/equipments	35.6	16.0	22.7	12.4	13.3	2.5
1.4	Poor linkages with other actors	30.6	13.3	20.9	17.1	18.2	2.8
0.07	Lack of ICTs	39.5	16.9	21.2	11.3	11.0	2.4
1.6	Costliness of ICTs	41.1	10.3	17.9	16.2	14.5	2.5
0.09	Others	0.2	0.2	0.6	0.2	1.5	0.5

Table 10
Classification of the problems in extension (Factor Analysis)

KMO Measure of sampling adequacy	Bartlett's test of chi square	Degree of freedom	Probability of significance
0.801	1107.9***	45	0.000
Factors	Factor1	Factor2	
Variables	in-service training, transportation, office facilities, visual aids, actors relations, lack and costliness of ICTs,	Low salaries, personnel affairs, mismatching of authority and responsibility	
Clusters	Conducting extension activities	Personnel affairs	
Variables for clusters	Lack of ICTs, personnel affairs		

*** $\square < 0.01$

are seen as important issues and reduce the likelihood of sustainable development.

Insufficient facilities of farmers' organizations and of the individual farmers, as well as the nonexistence of cyber culture in rural areas are seen as the main obstacles for ICTs usage. Based upon the findings and recent modifications in the world agenda, some suggestions can be made as follows:

- Adequate number and well-trained extension workers are required as the basis of a successful extension service;
- Continuous in-service training must be organized, by considering information society abilities and sustainable development aspects;
- Extension staff must concentrate on farmer training activities rather than diluting their efforts through a wide range of other activities such as the bureaucratic ones;
- Human resources development and sustainable production tasks should have a priority within the extension goals, beside the usual yield increases in conventional production;
- Programming should be accepted as fundamental in extension work. Programs must include goals, responsibilities, indicators, monitoring and evaluation steps. In the programs, detailed work plans must be described by each relevant actor with a sustainable dimension;
- Cyber/digital extension seems to be a form of diffusion of innovation in the near future. In this respect, extension organizations must be kept aligned with this transformation by investing on staff and infrastructures. ICTs might help to establish the bottom up and sustainable information flows, especially by giving more opportunity to voiceless rural people such as women, youth and poor farmers in rural and removed areas;
- Encouraging information society facilities will create life-long learning abilities in extension service and rural development.

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