Ciência Rural, Santa Maria, v.54:06, e20230228, 2024
http://doi.org/10.1590/0103-8478cr20230228
ISSNe 1678-4596
RURAL EXTENSION

Different extension organizations in Türkiye: Aegean region example

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ABSTRACT: This study assessed different extension actors in the Aegean region in terms of key indicators that influence the success of extension activities. Along with the primary goal, factors affecting extensionists' satisfaction with their working conditions were investigated. The data were collected through questionnaires from 966 extensionists working in public, private firms, farmer organizations, input dealers and consultancy in eight provinces in the region. According to the results, 80% of the farmers received extension services from public organizations in the region. While those who work in the public sector are more satisfied economically, their professional satisfaction is the lowest. Extension workers' personal skills, sharing ideas, creativity, and authority-responsibility harmony, working freedom, staff availability and support are increasing satisfaction with working conditions in organizations. While female farmers are targeting more by the public and consultants, educated farmers are more prioritized in firms, dealers, and consultations. The internalization of innovative values is lower in the public organizations compared to the others. It is foreseen that; the public will carry out extension in developing countries for a long time. The success in extension organizations, the innovation process and pluralistic structure became quite more dependent on the relations with the private sector, domestic and international market mechanisms, demand driven giving advice and government policies on social, economic, and environmental.
Key words: agricultural extension systems, public-private-input dealers-farmer organizations- consultants, pluralistic extension.

Diferentes organizações de extensão na Turquia: exemplo da região do Egeu

RESUMO: Este estudo avaliou diferentes atores de extensão na região do Egeu em termos de indicadores-chave que influenciam o sucesso das atividades de extensão. Junto com o objetivo principal, foram investigados os fatores que afetam a satisfação dos extensionistas com suas condições de trabalho. Os dados foram recolhidos através de questionários a 966 extensionistas que trabalham em empresas públicas, privadas, organizações de agricultores, comerciantes de insumos e consultoria em oito províncias da região. De acordo com os resultados, 80% dos agricultores recebem serviços de extensão de organizações públicas da região. Enquanto aqueles que trabalham no setor público estão mais satisfeitos economicamente, sua satisfação profissional é a mais baixa. Habilidades pessoais dos extensionistas, compartilhamento de ideias, criatividade e harmonia autoridade-responsabilidade, liberdade de trabalho, disponibilidade e apoio da equipe estão aumentando a satisfação com as condições de trabalho nas organizações. Enquanto as agricultoras são mais visadas pelo público e por consultores, as agricultoras educadas têm mais prioridade em empresas, revendedores e consultas. A internalização de valores inovadores é menor nas organizações públicas em relação às demais. Prevê-se que, o público realizará extensão em países em desenvolvimento por muito tempo. O sucesso nas organizações de extensão no processo de inovação e estrutura pluralista de hoje tornou-se muito mais dependente das relações com o setor privado, mecanismos de mercado nacional e internacional, aconselhamento orientado pela demanda e políticas governamentais sociais, econômicas e ambientais.
Palavras-chave: sistemas de extensão agrícola, público-privado-distribuidores de insumos-organizações de agricultores-consultores, extensão pluralista.

INTRODUCTION

Extension systems, and approaches in countries are reflections of policies, socio-economic conditions, and legal developments. Widespread extension approaches in the world until the end of the 1970s were central and aimed top-down information flow, and the activities were related to different issues in agriculture and rural areas. Extension activities generally had carried out with traditional technology transfer focus by public organizations. Training and visit approach and the reorganization of the Ministries of Agriculture in the 1980s, privatization and cost-sharing as liberalization trends in the 1990s, information systems instead of traditional technology transfer models, participation and empowering the local people in the 2000s and following years innovation systems and market driven approaches have become effective in the world agricultural extension agenda (CSAKI, 1999; VAN DER BOR et al., 1995; NORTON & ALWANG, 2020; MAULU et al., 2021; JAWOKO et al., 2023).

Received 04.27.23 Approved 08.08.23 Returned by the author 11.06.23
CR-2023-0228
Editors: Leandro Souza da Silva Janaína Brandão

Privatization trends, the organization of farmers, the increasing influence of the private sector in input production and supply, the diversification of information sources, the ease access to information, and production techniques such as organic agriculture, integrated pest management brought changes in the systems and approaches in extension (NORTON & ALWANG, 2020). The change was not limited to functioning, targets, and financing mechanisms, but also took place in structures such as the establishment of new organizations, and the transfer of responsibilities and staff to different organizations (ANDERSON & FEDER, 2003). The transformation of extension organizations increases the links with different actors (ROGERS, 1996; ROGERS, 1993), and strong connections with innovation systems and market mechanisms. These developments led to organizational diversity, pluralistic structure, and interaction in extension systems (CARTER & HOLLINSWORTH, 2022). Despite all developments, ANDERSON & FEDER (2003) predict that extension will be carried out in a more public services manner for a long time in developing countries and regions where poor farmers are concentrated.

While extension approaches show the activities, collaborations, actions, and philosophy of a system, extension systems refer to the institutional structure such as ministry, university, or farmer organizations. The scope of the program, target groups, staff, financing, institutional structure, communication, and cooperation mechanisms are seen as criteria for comparing extension systems (RAMKUMAR & ROLLS, 1995; AXINN, 1992; DAVIS et al., 2020).

The roots of extension services in Türkiye go back to 1838 due to commercial agreements with European countries (ANONYMOUS, 1938). It is known that master farmers in the region were employed to inform and guide the farmers who migrated from the Balkans to Anatolia after the 93 War with Russia (1878) in the Ottoman Period (QUATAERT, 2008). The first extension organization in Türkiye established in Ankara, Eskişehir, and Manisa in 1943, and the organization throughout the country was completed in 1958. In the extension, conducted by the Ministry of Agriculture in the form of the general extension approach and free public service, where institutional structuring has been reorganized in different years, employing new extension approaches and/or responsibility such as training and visit approaches, food, and village affairs, etc. (ANONYMOUS, 2004).

It is stated that until 1987, farmer organizations were not very interested in extension in Türkiye (ÇIKIN & KARACAN, 1994). As a result of the "Leader Farmer Project" initiated in Tekirdağ in 1987 with the support of the Unions of Chambers of Agriculture of Türkiye and Germany, the Union of Chambers of Agriculture of Türkiye contributed to the extension activities (ŞENER et al., 1994).

In 2004 and following years, farmers aimed to give limited financial support for extension with the "Village Centered Agricultural Production Support Project" (KÖYMER). Through the project, the Ministry planned to establish a pluralistic and private extension system in Türkiye. Each district had consultant who were required to be a resident of the villages they were responsible. While the salaries of consultants were fully covered by the state in the first year, 5% farmer contributed to the following year and 10% in the third year of the project. KÖYMER was abandoned on January 1, 2007, due to the financing inadequacy of rural people and in some cases, because the public extension workers viewed the consultants as competitors, and due to the multi-headedness during their activities, and the low satisfaction levels of the consultants (BOYACI & YILDIZ, 2007). Following the experience of KÖYMER the Ministry have implemented "Development of Agricultural Extension Project (TAR-GEL) in 2007. By including KÖYMER, 2500 contracted extension were employed in the public extension organization in Türkiye (TEDGEM, 2009). In the light of the experiences in the world and in Türkiye, the "regulation of agricultural extension and consultancy services" was prepared on 8 September 2006 to support individuals and organizations that provide consultancy services to agricultural enterprises in Türkiye. The regulation ensured the extension as a pluralistic and effective structure. Within the scope of the regulation, issues to define agricultural enterprises that will receive consultancy services, agricultural consultants to provide extension services and responsibilities, support and payment criteria, audit, duties, and authorities (OFFICIAL GAZETTE, 2020). So, it was activated the the private consultant/consultancy system. According to their production branches, the consultants sign a one-year contract with a certain number (maximum 60) of farmers and extension services. The consultants, whose contract fee was paid by the state, work on their own behalf, as well as in organizations such as cooperatives, chambers, unions, and private consultancy organizations. Other important actors in extension are companies and dealers operating in the use, promotion, and sale of agricultural inputs, and private companies that process and market products.

Public organizations served dominantly in agricultural extension activities in the world until the 90s (VAN DEN BAN & HAWKINS, 1996; JAWOKO

et al., 2023). Currently, there is a pluralistic structure involving different actors such as governmental, international, and national organizations, NGOs, initiatives supported by donors, private businesses, and farmer associations in agricultural extension (DAVIS & FRANZEL, 2018). In this study, actors that help farmers adopt innovations for improving the living standards in rural communities are mentioned as "extensionists" since their roles in the region are comparable despite their differences in status. Unlike in other countries, agricultural input dealers in Türkiye are seen as important knowledge sources (BOZ et al., 2004; YILMAZ & KUTLAR, 2019).

The significance of this research lies in the fact that, Aegean region has an important place for the extension efforts, and important role in the Türkiye's agricultural economy. The Aegean Region, where the public, agricultural companies, dealers, farmer organizations, and private agricultural consultants are active and have a high agricultural production potential, has been included in the scope of the study. Aegean Region covers 12% of the total agricultural lands (23.8 million hectares) in Türkiye, 15.8% of the total employment in the agricultural sector (30.7 million people), and 13% of the total gross agricultural production value ($51.3 billion). 3.1% ($7.8 billion) of Türkiye's total export revenue of 254 billion dollars is of agricultural origin, and 21.3% of export revenue of agricultural products comes from the Aegean Region (TUIK, 2023). The results of the study will contribute to the improving of process, policies, and organizations in extension, and agricultural innovation systems.

This study assessed different extension actors in the Aegean region in terms of target topics, number of farmers served, extension skills, institutional culture, and adoption levels of innovations, which are indicators that affect the success of extension activities. Together with the primary objective, factors that affect satisfaction with working conditions of extensionists were investigated.

MATERIALS AND METHODS

Research data were collected through questionnaires from extension staff, private consultants, and input dealers working in public, firms, and farmer organizations operating in eight Aegean provinces in 2016 (Figure 1). A simple random sampling procedure was employed to calculate the number of interviewing extension personnel. The number of surveys to conduct in public extension institutions (Ministry of Agriculture and Forestry) was calculated as 549 with a 99% confidence interval and a 5% margin of error. It was calculated that out of 972 input sellers in the region totally interviewing, there was 213 input sellers for each province with a 95% confidence interval and 5% margin of error. The

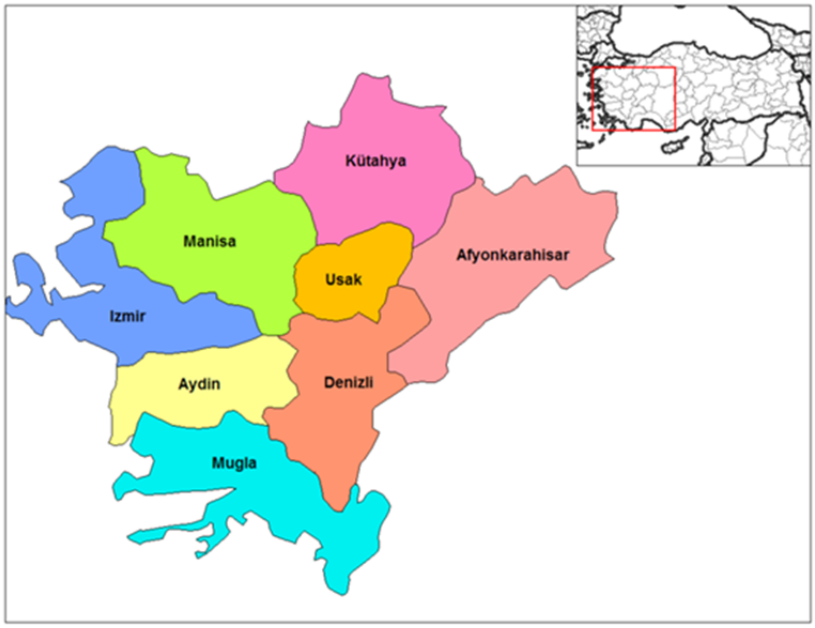

Figure 1 - Aegean Region Turkey.

survey asked for the full participation of consultants and extensionists in the chambers of agriculture, cooperatives, and companies (product processing, inputs, agricultural products, marketing, etc.), and 204 of them participated. Nine hundred and sixty-six extensionists from different organizations were interviewed, including the public sector (56.8%), input dealers (22.1%), consultants (8.3%), farmer organizations (cooperatives, unions, chambers) (6.7%), and private companies (6.1%). The distribution of extension staff by provinces are as followed 21.3% İzmir, 17.9% Manisa, 17.1% Aydın, 10.2% Denizli, 8.9% Afyon, 8.9% Kütahya, 8.7% Muğla, and 7.0% Uşak, (Table 1) (Figure 1).

In the interpretation of data, the descriptive statistics such as percentages, and averages, Kruskal Wallis test, and logistic regression analysis were employed. The testing of categorical outcome prediction models with two or more categories is possible with logistic regression. In a single model, independent variables may be categorical, continuous, or a combination of the two (PALLANT, 2010; BERK, 2018). Logistic regression analysis was employed to determine factors affecting extensionists' satisfaction with their working conditions. Personal skills, sharing ideas, providing opportunities for creativity, authority-responsibility equivalence, freedom in extension works, staff existence, objective support, monitoring, and evaluation parameters were used as an independent variable of the analysis.

Some personal characteristics of extensionists

It is said that factors such as age, education, in-service training (IST), experience, professional status, and their origin (rural or urban) the success of extensionists (BOYACI, 1998; EKPERE, 1974). Out of 41.1% of the extension workers are of rural origin, 37.7% have agricultural production experience, 18.2% work in provincial centers (81.8% work in districts/towns/villages) in the region. It is stated that 13% of the public extension personnel globally are women (SWANSON et al., 1989). According to IAASTD report, 15% of the public extension agents are women (MCINTYRE et al., 2009). In the study, it has been determined that 26.5% of the extensionists were women.

According to a study conducted in the region about 30 years ago, 35% of public extension workers are graduated and 65% of them graduated in high school. While the rate of those who do postgraduate education is less than 3%, it is said that there is no PhD degree (OKTAY & ÖZKAYA, 1994). In another study conducted with public extensionists throughout Türkiye, it was determined that 14.5% of them held a master's degree and 1.7% a doctorate (BOYACI, 2007). In this study, 26% of the extensionists graduated from agricultural vocational high schools, and 80% of them were also educated in agriculture faculties. As a result, 94.8% of the extensionists in the region are graduated in agriculture, 17.2% have a master's degree (including the ongoing

Table 1 - Number and share (%) of extensionists participating in the research by provinces.

Province	Organization	Public	Firms	Input sellers	Cooperatives and Chambers	Consultants	----------Total----------	
							Number	Percentage (%)
İzmir	Number	94	14	52	28	18	206	21.3
	%	45.6	6.8	25.2	13.6	8.7		
Manisa	Number	79	6	45	10	33	173	17.9
	%	45.7	3.5	26	5.8	19.1		
Aydın	Number	86	21	27	5	25	164	17.1
	%	52.4	12.8	16.5	3	15.2		
Denizli	Number	78	3	18	0	0	99	10.2
	%	78.8	3	18.2	0	0		
Muğla	Number	40	10	32	1	1	84	8.7
	%	47.6	11.9	38.1	1.2	1.2		
Uşak	Number	51	5	8	4	0	68	7.0
	%	75	7.4	11.8	5.9	0		
Afyon	Number	56	0	20	8	2	86	8.9
	%	65.1	0	23.3	9.3	2.3		
Kütahya	Number	65	0	11	9	1	86	8.9
	%	75.6	0	12.8	10.5	1.2		
Region	Number	549	59	213	65	80	966	100.0
	%	56.8	6.1	22.1	6.7	8.3		

5.9%), and 2% have completed the doctoral program. The graduated faculty departments and rates the extensionists are as follow plant protection (22.6%), horticulture (17.4%), field crops (16.5%), animal sciences (11.1%), soil science (8.2%), agricultural machinery (5.9%), agricultural economics (5.2%), agricultural structures and irrigation (4.3%), agricultural products technology/food/dairy (0.9%), and landscape architecture (0.4%). Extensionists find the level of preparation for the business life of the courses given in the faculty education is low. Evaluation of faculty education is different according to organizations, and consultants consider education more adequate than others (Kruskal W. Test, Chi Square Value: 12.4, P value: 0,02). Most of the extensionists in the region can speak English (88.7%), 4.4% German, 2.3% French, 2% other languages, and 2.5% a second language besides English. According to the organizations, the foreign language speaking levels of the extensionists are different, and in the employees in the dealers and the public sector are low (Kruskal W. Test, Chi Square Value: 19.1, P value: 0).

Extensionists are on average 38 years old and have 11.1 years of work experience. Age and work experience are different according to organizations, and employees in firms and dealers are older and more experienced. It can be said that the recent start of consultancy practice and the employment of extension staff by farmer organizations have reduced the age and experience of the extensionists in these organizations (Table 2).

Extensionists' level of satisfaction with their jobs in economic and professional terms varies according to the organizations. While those who work in the public sector are more satisfied economically (Kruskal W. Test, Chi Square Value: 43.2; P value: 0), their professional satisfaction is the lowest. Professional satisfaction levels are higher among dealers, consultants, and those working in cooperatives/chambers (Kruskal W. Test, Chi Square Value: 36.3, P value: 0).

Some indicators in extension

The number of villages, farmers and products served, target farmer groups, and the level of adoption of extension advice by farmers are important indicators in the evaluation of extension organizations and their studies. In the Agricultural Extension and Applied Research Project (TYUAP), which is an adaptation of the Training and Visiting Approach in Türkiye, an extensionist was foreseen for 550 farmers in dry agriculture and 250 farmers in irrigated agriculture (TOKB, 1987), according to FAO (1991) an extensionist is responsible 781 farmers in Türkiye. In this study, it was found that an extensionist serves to 25.2 villages, 1559.1 farmers and the numbers vary according to organizations. In addition, an extensionist serves an average of 7836.3 hectares of land. The proportion of farmers receiving extension services in the region according to the organizations has determined as the public 80.3%, the dealers 10%, the companies 5%, the cooperatives/chambers 4.4% and the consultants 0.03%. According to the organizations, the number of farmers per extensionists varies between 51 and 2186 people. The group with the lowest number of farmers (51 people) is consultants, and the most crowded groups are public and company extensionists. Limiting the number of services to 60 farmers (by contracting) in the regulation on consultancy, and the extensionists

Table 2 - Age and professional experience of extensionists by organization, Kruskal Wallis T.

Variable	Status	Number	Mean	Mean rank	Chi Square	Degrees of freedom	P value
Age	Public	510	36.7	405.6	82.90***	4	0.00
	Firm	48	42.5	530.2			
	Input sellers	177	43.0	554.7			
	Coop/chambers	56	35.2	357.9			
	Consultant	70	33.5	294.1			
	Region	861	38.0				
Experience	Public	540	11.0	460.7	89.11***	4	0.00
	Firm	57	13.8	531.2			
	Input sellers	195	13.3	565.3			
	Coop/chambers	64	9.3	425.7			
	Consultant	75	5.4	231.2			
	Region	931	11.1				

The level of significance: ***α <0.01.

of the companies to provide services at the provincial and/or district level is effective. Extensionists in the region think that they have reached 55.7% of the farmers they are responsible. The consultants, who regularly reach 76.3% of the farmers they are responsible for, are better position compared to other organizations. In the public sector, one of the two farmers is provided with regular extension services. In the region, extensionists are serving to average 7.5 different plants. The number of plants served is high in cooperatives/chambers and company extensionists, and low in consultants (Table 3).

Extension activities

It is said that 56% of working time in public extension in the region 30 years ago was for extension activities (OKTAY & ÖZKAYA, 1994). Today, extensionists in the region devote 26.4% of their time to extension activities and 24.7% to bureaucratic work. The share of the activities carried out work time varies according to the organizations. More time allocates for extension and bureaucratic work in the public sector (Table 4). In-service training (IST) activities of organizations are of great importance for updating information and personal development. IST in the region is not at the desired level but, it is higher in consultants, cooperatives/chambers, and companies compared to others (Kruskal W. Test, Chi Square Value: 27.1, P value: 0).

In addition to the adequacy and sustainability in financing, the diversity of resources is important in extension studies. Support from different sources demonstrates the integration of extension with the industry. According to FAO (1991), public extension expenditure is $5.3 per farmer in Türkiye. According to BOYACI (2007), annual extension expenditures per farmer in the public sector are around $2. In the financing of extension in the region, 51.1% public, institutions' own resources 20%, farmer organizations 6.9%, local governments 5.1%, agreements (public-private) 4.6%, foreign-sources 3.4%, other ministries 1.2% and other sources have a share of 7.7%. According to these rates, it can be said that the contribution of different resources to the extension services is limited. This low contribution is also restricting collaboration and jointly agenda setting in the system.

Table 3 - Comparison of some extension indicators by organizations, Kruskal Wallis T.

Indicators	Status	Number	Mean	Mean rank	Chi Square	Degrees of freedoom	P value
Village numbers	Public	512	30.4	410.3	56.72***	4	0.00
	Firm	46	28.8	576.2			
	Input sellers	172	19.5	500.5			
	Coop/chambers	60	17.1	477.7			
	Consultant	73	6.8	294.5			
	Region	863	25.2				
Farmer numbers	Public	479	2185.9	483.3	209.33***	4	0.00
	Firm	44	1460.0	419.7			
	Input sellers	172	751.2	391.5			
	Coop/chambers	60	954.6	442.2			
	Consultant	80	50.8	65.1			
	Region	835	1559.1				
Regularly reached farmer rate (%)	Public	502	48.2	373.8	92.23***	4	0.00
	Firm	46	58.5	465.7			
	Input sellers	192	64.0	509.9			
	Coop/chambers	62	64.6	510.9			
	Consultant	75	76.3	618.4			
	Region	877	55.7				
Number of plants of interest	Public	456	7.6	398.4	27.25***	4	0.00
	Firm	42	8.5	406.6			
	Input sellers	157	8.1	411.7			
	Coop/chambers	55	8.6	389.4			
	Consultant	66	4.5	253.1			
	Region	776	7.5				

The level of significance: $^{***}\alpha < 0.01$.

Table 4 - Shares of extension and bureaucracy work overtime by organizations, Kruskal Wallis T.

Indicators	Status	Number	Mean	Mean rank	Chi Square	Degrees of freedoom	P value
Extension activities (%)	Public	537	30.6	506.9	67.06***	4	0.00
	Firm	54	20.5	356.7			
	Input sellers	186	17.4	340.1			
	Coop/chambers	60	22.5	418.4			
	Consultant	75	25.7	486.8			
	Region	912	26.4				
Bureaucratic workload (%)	Public	537	30.5	511.1	66.92***	4	0.00
	Firm	54	14.4	367.2			
	Input sellers	185	13.6	344.9			
	Coop/chambers	60	24.9	452.5			
	Consultant	75	17.5	402.3			
	Region	911	24.7				

The level of significance: ***α <0.01.

Target groups in extension

The target groups in extension varies according to country policies, extension approaches, development goals, and socio-cultural and economic conditions. According to extensionists, 36.4% of the services are for medium-sized businesses, 34.1% for small businesses, and 29.5% for large businesses. Out of 16.2% of extension studies in the region target women farmers. The most frequently contacted farmers in extension studies have an average of 6.2 years of education. Target farmers are different according to the organization, while the firms and consultants are serving mostly to the big farmers but least interested with the small ones. Women farmers are more targeting by the public and consultants. Educated farmers are prioritized target groups in the firms, dealers, and consultations (Table 5).

The polyculture production structure in the region leads to plants diversity. As with the number of plants that extensionists serve, the product groups they mainly work with are also different. Public and cooperative/chamber for cereals, oilseeds, and legumes; firm and cooperative/chamber for industrial plants; cooperative/chamber and consultants to fruits, the firms and dealers allocate more time to vegetables (Table 6).

Priorities in extension

The priorities of the extensionists in the study were product quality, production and productivity, environmental issues, farmer and consumer health, and input costs. These priorities should be compatible with the needs of the farmers/ target groups (JAWOKO et al., 2023). The fact that the plants in the region are subject to export, highlights the targets for product quality. Production and efficiency increase, which are classical targets in extension, are in second place. Environmental awareness and human (farmer, worker, and consumer) health are also priorities. Reducing production costs (such as energy, labour, and inputs) is in the last place in the region. However, increases in input (fertilizer, pesticides, etc.) prices, especially energy (electricity, diesel oil) after the Covid-19 Pandemic and cost-reducing techniques started to become the priority of the research and extension agenda. Subject priorities in extension studies are different according to organizations. Improving product quality in dealers, and consultants, production and yield increases in consultant, dealer and cooperative/chambers, environmental issues in the dealer and cooperative/chambers, the farmer and consumer health in dealers, consultants, and cooperatives/chambers, and in consultants the production costs have higher priorities (Table 7).

Information resources in the development of extension advice

Participatory approaches that enable farmers and rural people to participate in problem identification and solution processes, strengthen the local area, and increase the influence of farmers on the extension agenda have gained importance in the last 30 years. In the study, the attitudes such as including the problems, priorities, opinions, suggestions, and innovations of farmers in the creation of extension advice, accepting rural areas and farmers as information sources, and providing feedback from farmers are gathered under the name of farmer first. It is seen that the farmer first approach is not at the

Table 5 - The most frequently contacted target farmers by extensionists, Kruskal Wallis T.

Target Groups	Status	Number	Mean	Mean rank	Chi Square	Degrees of freedoom	P value
Big farmers (%)	Public	532	30.83	475.9	12.90**	4	0.01
	Firm	54	31.19	466.3			
	Input sellers	196	24.74	401.1			
	Coop/chambers	62	30.45	474.0			
	Consultant	76	31.76	490.6			
	Region	920	29.61				
Small farmers (%)	Public	531	35.43	473.2	9.75*	4	0.05
	Firm	54	27.31	390.2			
	Input sellers	196	35.44	472.8			
	Coop/chambers	62	32.60	439.5			
	Consultant	76	27.22	401.1			
	Region	919	34.09				
Women farmers (%)	Public	517	18.01	485.3	31.72***	4	0.00
	Firm	53	15.11	423.7			
	Input sellers	195	11.71	367.1			
	Coop/chambers	58	14.41	419.8			
	Consultant	75	17.97	458.2			
	Region	898	16.24				
Education level of mostly contacted farmers (year)	Public	518	6.0	418.3	30.58***	4	0.00
	Firm	48	6.9	531.9			
	Input sellers	195	6.7	500.0			
	Coop/chambers	62	6.0	434.7			
	Consultant	74	6.6	487.6			
	Region	897	6.2				

The level of significance: ***$\alpha < 0.01$; **$\alpha < 0.05$; *$\alpha < 0.1$.

desired level in the region but, is partially adopted by the consultants compared to the others (Kruskal W. Test, Chi Square Value: 15.7, P value: 0).

In the past while public research institutions were the most important source of innovations and extension messages in the traditional technology transfer model, different sources play an active role in today. Markets expansion in the thought of information and innovation systems; farmers' organizations on local priorities and collaborations; information and communication technologies are effective resources in knowledge production and access. The information sources preferred in the creation of extension messages in the region are different according to the organizations. Research institutions in consultants and firms, farmers and their organizations in cooperatives/chambers, and market mechanisms are more important in the firms and consultants (Table 8).

Cultural values in extension organizations

Discussion and sharing of ideas, transparency in management, participation in the decision-making process, communication, and an environment for team culture were defined as "sharing skills" in the organization. The existence levels of the skills were different according to the organizations, and the sharing skills in the consultant, firm, and cooperative/chambers are higher. In the organizations, extensionists' expressing their ideas, sharing them with the colleagues, and importance of the creative potentials were described as "creative skills". The tendencies, which are thought to be the trigger of change in organizations, are higher in consultants and firms. The complex agricultural structure necessitates cooperation with different actors. Encouraging collaborations in the execution of extension activities, the level of success in projects with different actors and regularly sharing of the results of the work with the interest groups are defined as "cooperation skills". Collaboration skills are different according to the organizations and stronger in consultants (Table 9).

The existence levels of some issues, such as the structure of extension organizations, functioning, ability to change and interaction within, and outside the organization discussed within the scope of

Table 6 - The most worked plant groups by organizations, Kruskal Wallis T.

Plant Group	Status	Number	Mean	Mean rank	Chi Square	Degrees of freedoom	P value
Cereals	Public	431	3.35	403.2	47.50***	4	0.00
	Firm	41	2.61	290.5			
	Input sellers	158	2.82	321.8			
	Coop/chambers	48	3.27	391.5			
	Consultant	54	2.26	239.6			
	Region	732	3.11				
Oilseeds and legumes	Public	359	2.51	324.3	19.15***	4	0.00
	Firm	38	2.45	305.2			
	Input sellers	127	2.25	281.3			
	Coop/chambers	43	2.88	365.7			
	Consultant	52	2.00	238.8			
	Region	619	2.44				
Industrial plants	Public	379	2.76	324.8	9.49*	4	0.05
	Firm	40	3.18	381.2			
	Input sellers	136	2.81	329.8			
	Coop/chambers	47	3.11	367.6			
	Consultant	54	2.43	278.0			
	Region	656	2.79				
Fruits	Public	443	3.41	371.3	11.62**	4	0.02
	Firm	46	3.57	395.2			
	Input sellers	169	3.55	405.5			
	Coop/chambers	52	3.71	429.8			
	Consultant	72	3.82	452.7			
	Region	782	3.51				
Vegetables	Public	408	3.09	338.2	32.22***	4	0.00
	Firm	50	3.66	432.5			
	Input sellers	183	3.68	434.0			
	Coop/chambers	47	3.49	402.2			
	Consultant	57	3.12	350.1			
	Region	745	3.30				

The level of significance: ***α <0.01; **α <0.05; *α <0.1.

innovative corporate values are different according to the organizations. Clearly definition of success indicators in firms, consultants, and dealers; harmony of authority and responsibilities in firms, cooperatives-chambers, consultants, and dealers; objectively acting in supporting the works, in the consultant, dealer, firm, and cooperatives/chambers; regularly monitoring and evaluation of the works in the consultant, dealer, firms and cooperative/chambers; adaptation the beneficial formations from different institutions to the organization in consultants, firms and dealers; promoting of cooperation and linkages with different actors in consultants, dealers and companies; strong communication between employees in the advisor and cooperative/chambers are observed in the region. Unfortunately, all these innovative basic features found neither sufficiently internalized and nor at intended level in the public organizations (Table 10). It seen that the public organizations are in paradox on these criteria. For instance, while public is guiding and supporting these values for adapting in consultancy organizations, but it was not able to internalize the cultural values within its own body.

Adoption of extension advice

Adoption of extension advice and innovations contribute to change, welfare level, and competitiveness and increases socioeconomic benefits of research and extension efforts in rural areas. For this reason, the adoption levels of advice/innovations are important criteria in measuring the success of extension organizations and projects. In the region, extensionists developed an average of eight extension advice in the last five years. In the region, the adoption

Table 7 - Priority target topics in extension by organizations, Kruskal Wallis T.

Topics	Status	Number	Mean	Mean rank	Chi Square	Degrees of freedom	P value
Improving product quality	Public	525	4.23	439.5	12.35**	4	0.02
	Firm	54	4.13	406.5			
	Input sellers	195	4.39	501.8			
	Coop/chambers	61	4.26	458.9			
	Consultant	74	4.39	473.6			
	Region	909	4.27				
Increasing production and efficiency	Public	529	4.21	442.7	8.64*	4	0.07
	Firm	51	4.08	414.8			
	Input sellers	197	4.32	494.8			
	Coop/chambers	61	4.30	469.4			
	Consultant	74	4.34	471.2			
	Region	912	4.24				
Reducing the environmental damage of applications	Public	529	3.99	441.9	9.52*	4	0.05
	Firm	54	3.94	417.2			
	Input sellers	197	4.16	494.8			
	Coop/chambers	59	4.22	497.9			
	Consultant	74	4.09	460.4			
	Region	913	4.05				
Protecting farmer and consumer health	Public	549	3.88	473.61	10.73**	4	0.03
	Firm	59	3.57	404.05			
	Input sellers	213	3.97	524.11			
	Coop/chambers	65	3.89	490.34			
	Consultant	80	3.94	496.31			
	Region	966	3.89				
Reducing input costs	Public	549	3.69	482.88	8.29*	4	0.08
	Firm	59	3.29	390.96			
	Input sellers	213	3.64	496.66			
	Coop/chambers	65	3.77	519.15			
	Consultant	80	3.72	491.98			
	Region	966	3.66				

The level of significance: ***α <0.01; **α <0.05; *α <0.1.

ratio of extension advice is 56.2% on average, and farmers are more adopting the suggestions of input dealers, consultants, and firms (Table 11).

The adoption levels of extension advice by farmers have been compared as two groups low (below average) and high (average and above average). Increase on the age of the extensionists, their job satisfaction, and the proportion of farmers reached, decreasing of farmer's ages, the level of education increases, the number of advice developed, and targeted big farmers are accreting the adoption levels of the advice. The level of adoption in industrial plants, fruits, and vegetables is higher than in other crops. The bureaucratic workload, priority to small farmers and female farmers, the level of adoption of the advice decreases in extension organizations (Table 12).

The effect of organizational structure and operation on adoption

In the adoption of innovations/advice, some features related to organizational structure and functioning affected the region. In-service innovation training, clearly defined success indicators, monitoring, and evaluation of extension activities, satisfaction of extensionists with working conditions, strong communication among employees, using of the farmer first approach, and the strong relationships with research rise the adoption levels (Table 13).

The factors affecting the satisfaction with the working conditions were examined by regression analysis. Adoption levels of extension suggestions were investigated by forming two groups below average, and above and average. Personal skills (adapting to change easily, taking criticism

Table 8 - Information resources used in creating extension advice in organizations, Kruskal Wallis T.

Resources	Status	Number	Mean	Mean rank	Chi Square	Deg. of freedoom	P value
Research organization	Public	549	2.73	480.7	23.92***	4	0.00
	Firm	59	2.85	517.9			
	Input sellers	213	2.55	435.1			
	Coop/chambers	65	2.70	479.3			
	Consultant	80	3.15	609.7			
	Region	966	2.73				
Farmers and their organization	Public	549	3.26	499.8	16.94***	4	0.00
	Firm	59	3.00	433.8			
	Input sellers	213	2.94	427.5			
	Coop/chambers	65	3.43	551.3			
	Consultant	80	3.28	502.3			
	Region	966	3.19				
Markets and their actors	Public	549	2.42	463.8	11.83**	4	0.02
	Firm	59	2.75	555.9			
	Input sellers	213	2.54	498.9			
	Coop/chambers	65	2.40	458.5			
	Consultant	80	2.69	544.8			
	Region	966	2.48				

The level of significance: ***α <0.01; **α <0.05.

into account, not being biased, being successful in teamwork, setting goals), sharing ideas, providing opportunities for creativity, the harmony of authority-responsibility, free working environment (initiative, and risk takers), while objective support increases the satisfaction with the working conditions of the extensionists, the monitoring and evaluation process decreases. It can be said that the belief on monitoring and evaluation process is not objective is effective at the end (Table 14).

Table 9 - Promotion of some skills by organizations, Kruskal Wallis T.

Skills	Status	Number	Mean	Mean rank	Chi Square	Degrees of freedoom	P value
Sharing	Public	549	2.70	447.22	41.82***	4	0.00
	Firm	59	2.93	521.97			
	Input sellers	213	2.79	486.3			
	Coop/chambers	65	2.95	540.83			
	Consultant	80	3.41	650.08			
	Region	966	2.81				
Creativity	Public	549	3.09	449.19	27.13***	4	0.00
	Firm	59	3.41	567.48			
	Input sellers	213	3.18	495.45			
	Coop/chambers	65	3.28	531.31			
	Consultant	80	3.54	586.38			
	Region	966	3.18				
Collaboration	Public	549	3.01	471.08	15.18***	4	0.00
	Firm	59	2.98	474.51			
	Input sellers	213	2.93	469.04			
	Coop/chambers	65	3.09	505.99			
	Consultant	80	3.40	595.56			
	Region	966	3.03				

The level of significance: ***α <0.01.

Table 10 - Some cultural values related to functioning by organizations, Kruskal Wallis T.

Values	Status	Number	Mean	Mean rank	Chi Square	Degrees of freedoom	P value
Clear definition of success indicators of extension efforts	Public	523	2.65	400.5	40.34***	4	0.00
	Firm	52	3.33	549.7			
	Input sellers	175	3.04	486.5			
	Coop/chambers	58	2.95	469.4			
	Consultant	74	3.22	526.6			
	Region	882	2.83				
Harmony of authority and responsibilities	Public	534	2.33	387	91.53***	4	0.00
	Firm	53	3.06	540			
	Input sellers	183	3	527			
	Coop/chambers	60	3.05	537.4			
	Consultant	73	3.4	605.9			
	Region	903	2.64				
Acting objectively in work supporting	Public	528	2.82	394.2	57.94***	4	0.00
	Firm	52	3.29	489			
	Input sellers	177	3.34	506.3			
	Coop/chambers	57	3.21	484.8			
	Consultant	71	3.68	581.1			
	Region	885	3.05				
Regular monitoring and evaluation of extension works	Public	531	2.87	403	49.14***	4	0.00
	Firm	51	3.49	538.3			
	Input sellers	181	3.28	493.9			
	Coop/chambers	59	3.22	490.4			
	Consultant	74	3.64	569			
	Region	896	3.08				
Installation of useful formations in the organization	Public	532	2.84	410.9	31.82***	4	0.00
	Firm	51	3.24	513.2			
	Input sellers	178	3.22	501.6			
	Coop/chambers	60	3.03	461.5			
	Consultant	73	3.33	524.9			
	Region	894	2.99				
The existence of strong communication among the employees in the organization	Public	530	2.81	439.11	26.17***	4	0.00
	Firm	50	2.84	446.48			
	Input sellers	183	2.72	416.01			
	Coop/chambers	59	3.00	479.45			
	Consultant	76	3.47	581.34			
	Region	898	2.86				

The level of significance: ***α<0.01.

Table 11 - Adoption levels of extension advice by organizations, Kruskal Wallis T.

	Status	Number	Mean	Mean rank	Chi Square	Degrees of freedoom	P value
Farmers adopting extension advice (%)	Public	523	49.7	391.7	78.62***	4	0.00
	Firm	52	64.1	539.9			
	Input sellers	202	65.7	556.2			
	Coop/chambers	63	62.6	521.3			
	Consultant	75	65.3	546.0			
	Region	915	56.2				

The level of significance: ***α <0.01.

Table 12 - Some extension indicators according to the adoption of the advice, T-Test.

Indicators	Adoption	Number	Mean	Standard deviation	T value	Degrees of freedoom	P value
Age	Low	558	37.3	9.02	-2.40**	816	0.02
	High	260	39.0	9.82			
Professional satisfaction	Low	617	3.3	1.11	-4.83***	902	0.00
	High	287	3.7	1.08			
Regularly contacted farmers (%)	Low	590	49.6	28.66	-9.8***	566	0.00
	High	278	69.4	27.36			
Education levels of farmers (year)	Low	612	6.1	2.01	-3.51***	477	0.00
	High	273	6.6	2.23			
Number of advice in the last five years	Low	427	7.3	10.82	-2.24**	259	0.03
	High	180	10.1	15.21			
Big farmers (%)	Low	612	28.4	22.56	-1.81*	888	0.07
	High	278	31.3	21.16			
Industrial plants	Low	417	2.7	1.33	-3.4***	627	0.00
	High	212	3.0	1.42			
Fruits	Low	505	3.4	1.28	-3.88***	748	0.00
	High	245	3.8	1.29			
Vegetables	Low	479	3.2	1.31	-2.79***	719	0.00
	High	242	3.5	1.33			
Bureaucratic workload (%)	Low	599	26.3	26.03	4.08***	640	0.00
	High	271	19.6	20.89			
Age of contacted farmers	Low	598	45.7	7.43	1.91*	602	0.06
	High	280	44.8	6.68			
Small farmers (%)	Low	611	36.4	26.32	4.45***	648	0.00
	High	278	29.0	21.47			
Women farmers (%)	Low	597	17.4	16.96	3.29***	609	0.00
	High	275	13.7	14.67			

The level of significance: ***α <0.01; **α <0.05; *α <0.1.

Table 13 - Adoption levels of advice according to organizational structure and environment, T-Test.

Organizational environment	Adoption	Number	Mean	Standard deviation	T value	Degrees of freedoom	P value
Satisfaction with working conditions	Low	594	3.05	1.135	-4.99***	519	0.00
	High	273	3.47	1.157			
Receiving in-service training on innovations	Low	615	2.42	1.082	-2.91***	896	0.00
	High	283	2.65	1.146			
Clear definition of success indicators	Low	575	2.70	1.066	-4.99***	840	0.00
	High	267	3.10	1.149			
Regular monitoring and evaluation of activities	Low	587	2.94	1.097	-5.48***	496	0.00
	High	269	3.39	1.156			
Strong communication among the employees	Low	588	2.82	1.111	-1.60*	483	0.09
	High	270	2.96	1.212			
Relationships with research	Low	626	2.68	0.693	-2.97***	913	0.00
	High	289	2.83	0.765			
Collaboration with different actors	Low	626	2.95	0.921	-4.09***	492	0.00
	High	289	3.25	1.069			
Farmer first approach	Low	626	3.11	0.666	-3.28***	490	0.00
	High	289	3.28	0.777			

The level of significance: ***α <0.01; **α <0.05; *α <0.1.

Table 14 - Factors affecting satisfaction with working conditions, Logistic regression analysis.

	B	S.E.	Wald	df	Sig.	Exp(B)
Constant	-0.408	0.031	173.78	1	0.00	0.665
Factors	B	S.E.	Wald	df	Sig.	Exp(B)
Constant	-8.14	0.306	705.755	1	0.00	0.00
Personal skills	0.964	0.084	133.036	1	0.00	2.62
Sharing ideas	0.715	0.084	73.257	1	0.00	2.04
Providing opportunities for creativity	0.336	0.082	16.65	1	0.00	1.40
Authority-responsibility equivalence	0.144	0.044	10.922	1	0.00	1.16
Freedom in extension works	0.142	0.052	7.491	1	0.01	1.15
Staff existence	0.119	0.065	3.361	1	0.03	1.13
Objective support	0.112	0.054	4.394	1	0.04	1.12
Monitoring and evaluation	-0.257	0.05	26.432	1	0.00	0.77
-2 Log likelihood 4375.793		Cox & Snell R Square 0.287			Nagelkerke R Square	0.388

CONCLUSION AND RECOMMENDATIONS

The complexity of agricultural production, the dependence on economic policies; low interaction with the information systems and markets; problems such as difficulties in monitoring the impact, and financial unsustainability have led to some developments such as localization, cost-sharing, and the increase in the function of farmer organizations, as well as different extension approaches in the world (ANDERSON & FEDER, 2003). In the region, differences in the organizations were summarized with the help of some basic variables that affect the functioning in extension. The existence levels of these variables have defined as low and high. Some organizational characteristics of the better performers were roughly presented. In the region, consultancy, dealers, firms, cooperatives/ chambers, and the public were lined up according to the working environment and the goodness of basic extension indicators. In the extension process, such as fewer farmers, more extension time, farmer priorities, cooperation with different actors, and intra-organizational cooperation increase the performance of services. Although, the Ministry defines the principles and what-how-to run-in line with the functioning and supervision of consultancy, it is contradictory that it lags because of not doing. Conversely, the extension activity of farmers' organizations will positively affect the organization in rural areas.

The success in extension organizations in the innovation process and pluralistic structure became quite more dependent on the relations with the private sector, domestic and international market mechanisms, given by demand and government policies on social, economic, and environmental issues.

ACKNOWLEDGMENTS

The study was prepared by using the data of "A Research on Improving of Agricultural Innovation System: case of Aegean Region" TUBITAK Program 1001, Project No 112O208.

DECLARATION OF CONFLICT OF INTEREST

The authors declare no conflict of interest. Sponsors had no role in the design of the study; in the collection, analysis, or interpretation of data; in the writing of the manuscript and in the decision to publish the results.

AUTHORS' CONTRIBUTIONS

All authors contributed equally for the conception and writing of the manuscript. The authors critically revised the manuscript and approved of the final.

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