Investigating the Effective Factors on the Success of Agricultural Engineering and Technical Advisory Services Companies in the Townships of Sari, Gaemshahr and Babol, Iran

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Abstract: The overall aim of the present study was to investigate the effective factors on the success of agricultural engineering and technical advisory services companies in the townships of Sari, Gaemshahr and Babol, Iran. There were 496 experts in the companies. Research methodology applied in this study was a combination of descriptive-analytical and quantitative methods. To run the appropriate analyses, SPSS 16 software was employed. Through stratified random sampling, 199 experts were selected and questioned. Cronbach's alpha was 0.89. The mean of specialists' age and their working experiences were 32.56 and 3.17, respectively. The mean of the experts' communication levels was medium. Also, 28% variances of the success of agricultural engineering and technical advisory services companies in Sari, Qaemshahr and Babol was determined through five factors of educational services dimensions, experts' communication, executive policies and solutions, facilitative factors and obstacles.

Key words: Agricultural engineering and technical advisory services % Sari % Gaemshahr % Babol

INTRODUCTION

Today, in many developing countries including Iran, technologies and knowledge transfer are considered as government responsibilities and it is always expected that these activities in promoting knowledge and technology should be provided through governmental institutions and agencies. Besides, by examining the performance and activities of the extension agencies during their term, we would realize the lack of success in implementing their mission. The 20-year reports by the World Bank from 1970 to 1990 [1] and the agricultural reports from Europe, Middle East and North Africa by Zijps [2], Saravanan [3] and Gowda and Sarvanan [4] show that the governmental extension systems in the world were significantly encountered with investment deficits, technological advancement limitation and the lack of the user's participation.

In order to compensate such weaknesses and shortcomings, we need tools with greater accountability such as the privatization of agricultural extension. The achievement in the agricultural extension privatization requires preconditions such as developed communications networks, efficient marketing systems, informed and knowledgeable farmers, operational extension policies, steady research programs and adequate credit facilities [5]. In order to establish a successfully private extension program, we have to delve into the professional expertise of the extension agents [6, 7], launching the alternatives for providing the financial resources and technical advisory services for different clients [8, 9, 10], government planners and agricultural policy-makers' attention to public and private agricultural sectors' functions [10], determining and establishing the legal requirements, professional and educational management, companies'

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empowerment at the early stages and during implementation phases [11], clients' income and genders [7].

Agricultural extension privatization in Iran has been instigated by establishing and supporting the agricultural engineering and technical advisory services companies. The agricultural engineering and technical advisory services companies embarked on in Mazandaran province in 1386. The number of active companies in the province was 105 and they recruited 1258 people. The number of companies in Sari, Babol and Ghemshahr is 14, 10 and 20, respectively, whose experts were 163, 134 and 199 accordingly [12].

The overall aim of the present study was to investigate the effective factors on the success of agricultural engineering and technical advisory services companies in the townships of Sari, Gaemshahr and Babol, Iran. Consequently, first, the experts' personal, academic and career characteristics, educational services dimensions, experts' communication, executive policies and solutions, facilitative factors and obstacles were identified and eventually the relation between these factors and the success of agricultural engineering and technical advisory services companies in the townships of Sari, Gaemshahr and Babol was determined.

MATRERIALS AND METHODS

Research methodology applied in this study was a combination of descriptive-analytical and quantitative methods. Ranking has been done through coefficient of variation. The ratio of standard deviation to mean was coefficient of variation. Data collected was analyzed using the Statistical Package for the Social Sciences (SPSS).

The field data collection instrument was a questionnaire. The content validity of questionnaires was measured by a group of specialists. In order to investigate the reliability of research questionnaire, 30 questionnaires were given to the experts, which were completedthrough interviews and surveys. Also cronbach's alpha was 0.89.

The statistical population consisted of the agricultural engineering and technical advisory services companies' experts in Sari, Babol and Gaemshahr. The number of experts was 496 [12]. The sample size was determined by Cochran's formula. Through stratified random sampling, 199 experts were selected and questioned.

RESULTS AND DISCUSSION

The Experts' Personal, Academic and Career Characteristics: The mean of specialists' age and their working experiences were 32.56 and 3.17, respectively. Experts selected for the study were at least 24 and at most 46 years indicating that experts were young. Besides, 55.2% of experts didn't have any work experience while 44.8% of experts have previous work records. Ahmadi [13] stated that one of the reasons for the failure of the wheat supervisory engineers is lack of adequate experience and skills. Chapman and Tripp [14] and Ajieh *et al.* [15] believe that one of the basic needs of any private extension activities is the extension agents' training. In order to succeed in privatized extension program, the professional competence of the field extension agents should be considered [7].

Regarding the experts' literacy and education level, 81.5% of the experts had a bachelor's degree and 18.5% had post-graduate degrees. According to the findings, 39.1% of the experts was from the native people and 60.9% were from other places.

The agricultural engineering and technical advisory services experts communication mean with experts in research, governmental extension agents and subject matter specialists was medium showing an inadequate and unsatisfactory communication among these experts. The privatized extension should be held accountable for the farmers through attempting to interact more with research centers, to produce or introduce technologies that would increase the efficiency of the system [16]. Also, Hosseini *et al.* [17] argued that there is a significant positive relationship between the number of contacts with agricultural researchers and private advisors' performances in the production increase. Based on the Table 1, the largest communication of experts was with governmental subject matter specialists.

The Success of Agricultural Engineering and Technical Advisory Services Companies: Based on Table 2, the most successful aspects of these companies were in areas such as meeting the clients' educational needs, establishing a change in clients' expertise and implementation of the extension advices.

The Educational Services Dimensions of the Agricultural Engineering and Technical Advisory Services Companies: Table 3 shows that the educational

Table 1: The agricultural engineering and technical advisory services experts' communication ranking (Number= 199)

Communication	M[1]	SD[2]	C.V[3]	R[4]
Governmental subject matter specialists	3.23	1.10	34.06	1
Governmental extension agents	3.28	1.13	34.45	2
Experts in research	2.67	1.15	43.07	3

1- Mean 2- Standard Deviation 3- Coefficient of Variation 4- Rank

Likert scale: zero (0), very low (1), low (2), medium (3), much (4), very much (5)

Table 2: The success of agricultural engineering and technical advisory services companies ranking (Number= 199)

Success	M[1]	SD[2]	C.V[3]	R[4]
Meeting the clients educational needs	3.69	1.25	33.87	1
Establishing a change in clients' expertise	3.57	1.23	34.51	2
Implementation of the extension advices	3.63	1.27	34.91	3
Creating a change in clients' knowledge	3.54	1.26	35.53	4
Increasing the clients' income	3.62	1.29	35.55	5
Changing the clients' attitude	3.63	1.32	36.44	6
Increasing clients' production	3.59	1.37	38.19	7
Reducing government spending on agriculture	3.56	1.38	36.66	8
Providing the clients' tools and equipments	3.37	1.33	39.49	9

1- Mean 2- Standard Deviation 3- Coefficient of Variation 4- Rank

Likert scale: zero (0), very low (1), low (2), medium (3), much (4), very much (5)

Table 3: The educational services dimensions of the agricultural engineering and technical advisory services companies ranking (Number= 199)

Educational services dimensions	M[1]	SD[2]	C.V[3]	R[4]
Courses time	4.01	1.14	28.46	1
Training facilities and equipments	3.84	1.21	31.48	2
The trainer's education quality	3.91	1.24	31.66	3
Training place	3.84	1.26	32.76	4
The relation of the content of the courses with the clients' need	3.84	1.31	34.14	5
Training courses duration	3.74	1.36	36.37	6

1- Mean 2- Standard Deviation 3- Coefficient of Variation 4- Rank

Likert scale: zero (0), very bad (1), bad (2), medium (3), good (4), very good (5)

courses organized by agricultural engineering and technical advisory services companies ranked first in the course of time and the Courses time was evaluated as appropriate. But, regarding the training courses duration and the relation of the content of the courses with the clients' need, the experts ranked the courses as low.

Executive Policies and Solutions for the Agricultural Engineering and Technical Advisory Services Companies: Based on the results in Table 4, reforming and developing new rules for companies was the most important executive policies and solutions for the agricultural engineering and technical advisory services companies.

Facilitative Factors in the Ownership Transferring Programs of the Extension Activities to the Agricultural Engineering and Technical Advisory Services Companies: The findings in Table 5 indicated that the Companies' access to modern information systems ranked first in facilitating factors in the ownership

transferring programs of the extension activities to the agricultural engineering and technical advisory services companies. Also, the government financial support of the private agricultural extension sectors and establishing laws in supporting the companies were the last in the facilitating factors in the ownership transferring programs of extension activities to agricultural engineering and technical advisory services companies ranking.

The Agriculture and Natural Resources Engineering Organization of Iran [11] considered the following as facilitative factors for implementation of engineering and technical advisory services companies:

C   Clarification of the legal requirements.
C   The justification of the private sectors merits for the governmental decision makers, managers, executives and clients,
C   Developing criteria, guidelines and administrative requirements and getting them approved by the legal authorities.

Table 4: Executive policies and solutions for the agricultural engineering and technical advisory services companies ranking (Number= 199)

Policies and strategies implementation	M[1]	SD[2]	C.V[3]	R[4]
Reforming and developing new rules for companies	4.12	0.97	23.58	1
Identifying the government policy towards companies	4.21	1.02	24.25	2
Monitoring and evaluating the companies' activities by government	4.06	1.07	26.26	3
Establishing regional private research companies	3.99	1.13	28.28	4
Government financial support of the companies in the beginning	4.16	1.21	29	5
Guaranteeing the commitments between farmers and companies	4.08	1.20	29.47	6
Insuring the companies for their obligations	4.15	1.26	30.29	7
Evaluating the companies competencies by Agriculture Engineering Organization	3.73	1.35	36.31	8
Determining the company's coverage level	3.68	1.43	38.98	9

1- Mean 2- Standard Deviation 3- Coefficient of Variation 4- Rank

Likert scale: zero (0), very low (1), low (2), medium (3), much (4), very much (5)

Table 5: Ranking the facilitative factors in the ownership transferring programs of the extension activities to the agricultural engineering and technical advisory services companies (Number= 199)

Facilitating factors	M[1]	SD[2]	C.V[3]	R[4]
Companies' access to modern information systems	3.78	1.16	30.64	1
Companies' communication with agricultural research	3.76	1.18	31.34	2
The Governmental extension support of companies	3.79	1.27	33.40	3
Agriculture-related industries existence in the region	3.75	1.28	34.16	4
Agricultural lands integrity	3.76	1.34	35.76	5
Establishing laws in supporting the companies	3.69	1.35	36.63	6
Government financial support of the private agricultural extension sectors	3.32	1.37	41.41	7

1- Mean 2- Standard Deviation 3- Coefficient of Variation 4- Rank

Likert scale: zero (0), very low (1), low (2), medium (3), much (4), very much (5)

Table 6: Barriers to agricultural engineering and technical advisory services companies activities ranking

Obstacles	M[1]	SD[2]	C.V[3]	R[4]
High population of small-scale clients	3.83	1.29	33.76	1
Clients' low literacy level	3.63	1.34	37.02	2
Lack of government support in assigning the tasks to companies	3.62	1.36	37.45	3
Low literacy level of agricultural extension agents	3.43	1.31	38.09	4
Skilled and experienced extension agents dearth	3.59	1.37	37.97	5
Low financial capacity of many small-scale clients to pay the extension services cost	3.62	1.38	38.2	6
The lack of privatization culture in the farming community	3.66	1.42	38.97	7
High age of the clients	3.49	1.40	40.16	8
Lack of safe and adequate space for companies from the governmental sectors	3.63	1.46	40.23	9
Clients low risk-taking and resistance to change	3.51	1.41	40.28	10

1- Mean 2- Standard Deviation 3- Coefficient of Variation 4- Rank

Likert scale: zero (0), very low (1), low (2), medium (3), much (4), very much (5)

Table 7: Multiple regressions for agricultural engineering and technical advisory services companies' success in the townships of Sari, Gaemshahr and Babol

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig
1 (Constant)	0.59	0.46	-	1.29	0.198
Educational services dimensions	0.28	0.07	0.27	4.22	0.000
Experts' communication	0.26	0.06	0.25	4.06	0.000
Executive policies and solutions	0.22	0.07	0.20	3.21	0.002
Facilitative factors	0.13	0.06	0.14	2.30	0.022
Obstacles	-0.14	0.07	-0.13	-2.03	0.044

$R= 0.55$ $R^2= 0.30$ Adjusted R Square= 0.28 F= 16.53 Sig = 0.000

C   Government conditional and provisional support of the agricultural engineering and technical advisory services companies.

C   Government guarantee of at least 5 years sufficient support of these companies.

Also, Ajieh *et al*. [15] regarded the inadequate governmental laws for privatization support as one of the major barriers in successfully agricultural extension privatization.

Obstacles to Agricultural Engineering and Technical Advisory Services Companies Activities: Based on Table 6, high population of small-scale clients was the main obstacle to agricultural engineering and technical advisory services companies activities. Adejo *et al*. [18] and Ajieh *et al.* [15] considers the large numbers of subsistence farmers as one of the main barriers in the privatization of agricultural extension success.

Multiple Regressions for Agricultural Engineering and Technical Advisory Services Companies' Success in the Townships of Sari, Gaemshahr and Babol: Multiple regression results in Table 7 shows that, 28% variances of the success of agricultural engineering and technical advisory services companies in the townships of Sari, Gaemshahr and Babol was determined through five factors of educational services dimensions, experts' communication, executive policies and solutions, facilitative factors and obstacles. Besides, educational services dimensions with the Beta of 0.27 had the most important significance in predicting the success of agricultural engineering and technical advisory services companies in the townships of Sari, Gaemshahr and Babol.

Based on Table 7, the regression line equation of the success of agricultural engineering and technical advisory services companies in the townships of Sari, Gaemshahr and Babol was as follows:

Y= 0.59 + 0.28(Educational services dimensions) + 0.26 (Experts' communication) + 0.22(Executive policies and solutions) + 0.13 (Facilitative factors) - 0.14(Obstacles).

CONCLUSION AND SUGGESTIONS

C   Regarding the low experience record of the experts in agricultural engineering and technical advisory services companies and lack of work experience before entering the companies, it is suggested that attention be given to experts' education.

C   It should be focused on five factors of educational services dimensions, experts' communication, executive policies and solutions, facilitative factors and obstacles in the extension privatization process through the agricultural engineering and technical advisory services companies in the townships of Sari, Gaemshahr and Babol.

C   Regarding the various dimensions of educational services of the agricultural engineering and technical advisory services companies, it is important to focus on factors such as training course duration, content fit to the clients' needs, training place, the trainers' education quality, training facilities and equipment and the course time.

C   It is recommended that the agricultural engineering and technical advisory services experts' communication with experts in research, governmental extension agents and governmental subject matter specialists be improved.

C   It is recommended that the reforming and developing new rules for agricultural engineering and technical advisory services companies, identifying the government policy towards companies and monitoring the companies' activities by government should be seriously considered.

C   Considering the facilitative factors in the ownership transferring programs of the extension activities to the agricultural engineering and technical advisory services companies, it is urgently required that the government financial support of the private agricultural extension sectors and the establishing laws in supporting the agricultural engineering and technical advisory services companies be emphasized.

C   Regarding the activities of agricultural engineering and technical advisory services companies, obstacles such as high population of small-scale clients, clients' low literacy level, lack of government support in assigning the tasks to companies, low literacy level of government agricultural extension agents and skilled and experienced extension agents dearth be considered.

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