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Effective Mechanisms for Design of Agricultural Advisory Service Network in West Azerbaijan Province, Iran

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Abstract: Development of the agricultural sector and increasing the resource productivity requires knowledge based research and skills of agricultural producers. Lack of effectiveness in agricultural production is related to low awareness, information and technical skills of farmers. Moving toward decentralization in agricultural extension is a new paradigm that improves agricultural extension activities. In this new paradigm, agricultural advisory services network is provided to changes in structure of agricultural extension in Iran. The main goal of this study is to investigate the effective mechanisms for designing agricultural advisory services network in West Azerbaijan province. The population of this research consisted of farmers in West Azerbaijan province who has conducted applicants for agricultural advisory services. Cochran formula was used. The sample size for the implementation of Cochran formula was 254. Cronbach's alpha coefficient for questionnaire was 0.87. The results showed that lack of complete confidence of agricultural advisory services companies was the limitation of acceptance of agricultural advisory services companies which was reported by farmers. Results also showed that mechanisms influencing agricultural advisory services network including economical, educational and extension component, policy making, social and cultural component, managerial and infrastructure components. These mechanisms could explain about 76 percent of the designed model.

Key words: Mechanism · Agricultural advisory services network · Agricultural extensional model · West Azerbaijan

INTRODUCTION

Agricultural sector is considered as one of the key parameters affecting on economic development which is derived by policy makers. In addition, the rate of population growth and needs to provide food, always have been concerned by planners [1]. In Iran, agricultural activities also play major role in economical growth [2]. Despite the importance and the role of agriculture sector in food production and goods exports, agricultural society is facing with many challenges including: poverty, unemployment, low productivity, environmental destruction, poor structure of human resources employed in agriculture, weak extension systems in the agricultural sector [3]. Exploitation and management of the most vital resources of Iran (water, soil, pasture lands and forests) are in the hands of 4200000 of rural people [4]. Majority of these farmers are uneducated or illiterate. Therefore, providing and development of human skills reassures in the agricultural sector with the professional skills and technical knowledge about farming and future planning. Rasouliazar and Fealy [4] believed that the cause of lack utilization in resource may be resulted from low awareness and lack of technical skills of farmers.

The suffering parameters affected on farmers in Iran are based on economic and financial crisis, the low performance of some public agencies and dependency on specialized knowledge and technology. Providing these foundations may find alternative ways to provide extension services to farmers in Iran [5]. Ghiyasvand and his coworkers [6] have pointed out major challenges of agricultural sector in Iran might be lack of human resources specialist to help farmers. Hosseini and

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Sharifzadeh [7] have described as process moving to decentralization in agricultural extension as a new paradigm that improves agricultural extension activities. In this new paradigm agricultural advisory services network (AASN) has provided to changes in structure of agricultural extension in Iran. Development of agricultural sector and increasing the resource of productivity requires progressive enhancement of knowledge and skills of agricultural producers [8]. Success and effectiveness of extension systems have been directly affected on contact to agricultural experts [9]. Providing all necessary contexts in recent years, private agencies and NGOs have emerged supplying extension services to farmers [10]. Commercialization in agricultural production and market demand require technical consulting services in agriculture [11]. Chipeta [12] has defined agricultural advisory services as activities that deliver new knowledge to farmers. These services can help them to develop agricultural and management skills. These services include; publishing and distributing information, delivery advices to farmers by individual or group of advisors, testing new techniques in their farms and development of farm management tools. The Importance of effective agricultural advisory services is due to a direct effect on performance and efficiency of farmers [13]. Agricultural consulting can be combined with other techniques in production process. These services may provide adequate access in credit facilities and product marketing, production increase and improving farmer's performance [14].

The main goal for the use of Agricultural Advisory Services (AAS) is to enhance agricultural product level through strengthening technical skills of farmers and monitoring their activities in their farm [15]. Anderson [8] has believed that agricultural consulting services are crucial elements that cause delivery information and improved welfare of farmers and other rural people. Agricultural System Engineering Organization (ASEO) in Iran [16] defined AAS as a network that aims at meeting technical and information needs of stockholders, modifying farm management and application of new technologies in the field of agriculture. The aim of AAS is to overcome the limitations of public extension. According to Ministry of Agriculture [17] there are 55 numbers of Agricultural Extension Services Centers (AESC) in west Azerbaijan province. Only 381 personnel are working in these AESCs. Comparison of this number of extension staff with the number of two hundred thousand farmers shows that the coverage of public extension is very low. Then AAS have important role in reduced the obstacles of public extension in west Azerbaijan. But establishment of AASC must be based on some principles and components.

Based literature survey, these components influenced on effectiveness of AAS. Level of farmers' income, crops yield, amount cost of consulting services, providing loan and facilities to farmers and receive payment in cash or credit from farmers [18-20]. These cases considered as economical factors. Providing guidance to farmers about AAS would be visit of farms and areas where consulting services are working, delivery training based on farmers' needs, use of experts and technical personnel for training farmers, providing appropriate technology to offer farmers, acquire communication skills by consultants, use of suitable technologies to provide necessary training. All of these consulting services pointed out in design of AASN were due to effective teaching methods and compatibility of recommendations with the agricultural condition (ecological) which were determined as extension of educational factors [19, 21].

Empowerment skills of consultants through training courses, effective planning for development services, participate members in decision making, improving quantitative and qualitative activities and continuous monitoring and evaluation of activities were consisted as managerial factors in design of AASN [8, 22]. Government national policies, financial and credit policies for farmers to enjoy private consulting services, recognition of the signature advisory companies, partial payment of the costs through voucher systems to farmers, monitoring and evaluation activities of private agencies, encouragement of farmers to set up organizations, developing infrastructure (roads, telecommunications, ICT), developing appropriate procedures for communication and coordination between public and private sector, support and incentive needs for companies to provide consulting services to marginalize (women and small farmers) were determined as policy-making factors that influenced in design of AASC [8, 18, 19, 22]. Farmers' education level, power of acceptance risk by farmers, consideration of the current trends and sub-culture in rural areas, considering the position of knowledge among the community members, acceptance of recommendations by other farmers, competition among farmers and communication with different groups of farmers (women; small farmers) were consisted as socio-cultural factors that influencing in

design of AASC [23, 24]. Distribution of farmers' lands, access to advisory office, exist of communicational infrastructure (roads, telecommunications), agricultural systems (subsistence and commercial agriculture systems) were determined as infrastructures influencing on design of AASC [25-28]. Therefore, the present study attempts to explain the affective mechanisms of economical, social, cultural, educational, extensional and managerial for design of AASC. Identifying such mechanisms, problems associated with agricultural advisory company in west Azerbaijan province can be resolved and the effectiveness of AAS was enhanced.

MATERIALS AND METHODS

The methodology used in this study involved a combination of descriptive and quantitative research and included the use of correlation, regression and descriptive analysis as data processing methods. A series of deep interviews were conducted with some expert farmer and consultant advisors and extension experts to examine the validity of questionnaire. A questionnaire was developed based on these interviews and relevant literature. The questionnaire included both open-ended and fixed-choice questions. The open-ended questions were used to gather information not covered by the fixed-choice questions and to encourage participants to provide feedback. A 5-point Liker scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used as a quantitative measurements. Content and face validity were established by a panel of experts consisting of faculty members and experts in Ministry of Agriculture. A pilot study was conducted with 30 rural people who had not been interviewed before the earlier exercise of determining the reliability of the questionnaire for the study. Computed Cronbach's Alpha score was 0.87 which indicated that the questionnaire was highly reliable. Independent variables in the study included economical, extension-educational, managerial, socio-cultural, policy and infrastructure factors that influence in design of effectiveness of Agricultural Advisory Services Network in Iran. The research population included all rural in the provinces of west Azerbaijan in Iran who applicant agricultural advisory services (N = 25000). Using a Cochran formula, sample size was determined 254. For measurement of correlation between the independent variables and the dependent variable correlation coefficients have been utilized and include Pearson test of independence.

RESULTS

The results of descriptive statistics showed that the average age of farmers were 42.5 years, with 23 years work experience. The average of farm size was 11.40 hectares. Majority of respondents (78.3%) was illiterate. Average years of receiving advisory services were 2.5. The average distance of farmers' farm to agricultural service center was 15 kilometers (Table 1).

Findings indicated that increased participation of stockholders in planning and decision making process was ranked as the first advantage (CV=0.246) and increases the specialty of extension services (CV=0.268) was ranked as the 2nd and increased responsibility and accountability to clients (CV=0.281) was in the next rank (Table 2). Findings indicated that the lack of Trust to AASC was ranked as the greatest obstacle (CV=0.329) and lack of recognition signed of advisory services companies (CV=0.339) and lack of cooperation from institutions and other organizations with them (CV=0.340) were ranked as the 2nd and 3rd, respectively (Table 3).

Positive and statistically significant correlations were found between the economical, extension-educational, managerial, policy, socio-cultural and Infrastructure components' and perception of farmers about effects of usage AASC (Table 4).

For predicating probability usage of AASC services by farmers, the logical of f(x) function was calculated that could be inferred to the population of this study (Table 5).

Based on statistically significant variables in the regression analysis and constant values, the regression equation could be derived as follows as usage of AASC services by farmers. The final multivariate regression model:

$$y = 11.432+0.224x_1+1.069x_2+0.29x_3+0.43x_4+0.17x_5+0.07x_6$$

The multivariate regression analysis indicated that about 76% of variance in respondents' usage of AASC could be explained by economical, extension-educational, managerial, policy-making, socio- cultural and infrastructure factors. Table 6 shows the standardized

Table 1: Descriptive statistics of Farmers

Characteristics	Mean	SD
Age (years)	42.48	12.70
Agricultural Experience (years)	23.82	12.58
Average years of receive advisory	2.50	3.71
Farm acreage	11.40	8.86
Distance to Agricultural services centers(km)	15.00	10.89

Table 2: Advantages of AAS from farmers' perception

Advantages	Mean	SD	Coefficient of variance (CV)	Rank
Increases participation of farmers in planning and decision making process	4.09	1.01	0.246	1
Increases the specialty of extension services	4.02	1.98	0.268	2
Increases responsibility of extension consultants	4.01	1.13	0.281	3
Increase farm management skills of farmers	3.96	1.16	0.292	4
Increases quality of extension services	3.33	1.03	0.309	5
Increases incomes of farmers	3.24	1.06	0.327	6
Improves access to Demand-Driven extension services	3.42	1.14	0.333	7
Provides rural development fields	3.50	1.17	0.334	8
Reduce cost in public sector	3.31	1.11	0.335	9
Draws attention to small farmer by public sector	3.29	1.11	0.337	10
Increases level of awareness of farmers	3.42	1.16	0.339	11
Increases the extension services to farmers	3.66	1.25	0.341	12
Increases bargaining power of farmers for acquire Information and services	3.60	1.25	0.347	13
Improve in public extension situation	3.4	1.21	0.355	14

Strongly agree=5, Agree=4, Intermediate=3, Disagree=2, Strongly disagree=1

Table 3: Priorities of importance obstacles to farmers' acceptance of AASC

Obstacles	Mean	SD	Coefficient of variance	Rank
Lack of trust in advisory services companies	3.31	1.09	0.329	1
Lack of recognition signed of AASC	3.18	1.08	0.390	2
Lack of cooperation of other institutions and organizations (public) with AASC	3.32	1.13	0.339	3
Lack of executive power of AASC	3.34	1.15	0.344	4
Weak interaction between the research sector and private sector	3.10	1.08	0.348	5
Illiteracy of farmers	3.40	1.21	0.355	6
Lack of coordination in the activities of public and private sector	3.31	1.19	0.359	7
Lack of monitoring and evaluation activities of AASC	3.39	1.23	0.362	8
High cost of consultancy services	3.52	1.28	0.363	9
Lack of necessary facilities (vehicle) by the consultants	3.24	1.19	0.367	10
Lack of clear guidance for using consulting services	3.34	1.25	0.374	11
tensions between different groups of farmers	2.99	1.13	0.377	12
Lack of expert and technical personnel in AASC	3.27	1.26	0.385	13
Unhealthy competition between advisory agencies	3.12	1.22	0.391	14
Lack of services to marginal farmers	3.40	1.35	0.397	15
Lack of subsidies and grants from the government for companies and farmers	3.36	1.34	0.398	16
Little attention to the needs of women farmers	3.37	1.36	0.403	17
Lack of credit and financial power of farmers	3.54	1.45	0.409	18

Strongly agree=5, Agree=4, Intermediate=3, Disagree=2, Strongly disagree=1

Table 4: correlations between variables and usage of AASC

Factors	r	Sig.
Economical factors	0.588**	0.000
Educational-Extensional factor	0.870**	0.000
Managerial factor	0.640**	0.000
Policy factor	0.526**	0.000
Socio–cultural factor	0.553**	0.000
Infrastructure factor	0.479**	0.000

**= P<0.001

direct, indirect and total effects associated with each of the six factors. An indirect effect reflects the impact a determinant has on a target variable through one or more other intervening variables in the model. The total effect on a given variable is the sum of the respective direct and indirect effects. The effect sizes with values less than 0.1 were considered small, those with less than 0.3 were medium and values with 0.5 or more considered large.

Table 5: Variable coefficients in regression analysis

Variable	B	SD	Beta	t	Sig.
Constant	11.432	1.509	---	7.55	0.000
Economical factors (x_1)	0.224	0.083	0.104	2.68	0.002
Educational-Extensional factor (x_2)	1.069	0.062	0.800	17.56	0.002
Managerial factor (x_3)	0.290	0.080	0.025	3.62	0.004
Policy factor (x_4)	0.430	0.045	0.036	9.55	0.005
socio–cultural factor(x_5)	0.170	0.077	0.035	2.24	0.000
Infrastructure factor (x_6)	0.073	0.086	0.024	3.04	0.004

R=0.879 R^2_{adj} = 0.768 F=156.411 Sig: 0.000

The most direct effect was 0.8 by the extension-educational factors and the most indirect effect 0.326 by managerial factors. Other factors such economical, policy, socio-cultural and infrastructure had total effect of 0.391, 0.235, 0.335 and 0.273, respectively. These six factors determinants accounted for ≈76.8% of the variance in the effectiveness of advisory services.

Table 6: Direct, Indirect and total effect of the research model

		Standardized estimates		
Out come	Determinant	Direct	Indirect	Total
Affective Services model	Economical factors	0.104	0.287	0.391
	Extension-educational factors	0.800	-	0.800
	Managerial factors	0.025	0.326	0.346
	Policy factor	0.036	0.199	0.351
	Socio-cultural factors	0.035	0.297	0.335
	Infrastructure factor	0.024	0.249	0.273
	R = 0.879	R^2_{adj} = 0.768	F = 156.411	Sig: 0.000

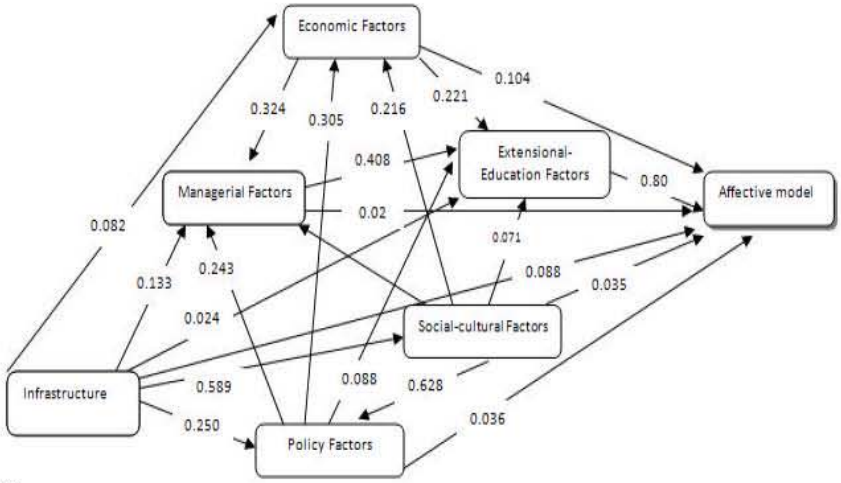

Fig. 1: Path analysis diagram

Figure 1 illustrates the results of the path analysis. In the path analysis, each variable was regressed in turn onto the set of variables which was previously used in the model. For example, when testing the affective factors on effectiveness of services, a regression analysis was performed predicting perceived ease of use from economical, extension-educational, managerial, policy, socio-cultural and infrastructure factors. By conducting these types of regressions, an output path diagram by drawing an arrow for each statistically significant relation was created. Numbers on the arrows are standardized coefficients.

DISCUSSION

Findings of the study increased the participation of farmers in planning and decision making process; which has increased the specialty of extension services and also increased responsibility and accountability to clients as stated the most advantages of AASC. This finding indicates that if AASC progress and develops in rural areas has great influential effect in agriculture development. The results of the study showed the lacks of trust to AASC and of recognition signed of advisory services companies were obstacles. Also the lack of cooperation from institutions and other organizations were the most obstacles of these types of companies. In this study we express influential factors that influenced the effectiveness of Advisory Services Company. Then designing the model of AASC should have been considered as an affective component. This finding also pointed out by several investigators named as Kidd and his coworkers [29], Linder [30], Martimort and Straub [31], Krishna and Shekra [32], Lerman [33], Dong and his research members [34], Fitzpatrik and his research team [35] and Safarzadeh [18].

The findings about economical factors are in accordance with several researchers' such as Safarzadeh [18], Beglarian and his coworkers [19]. Mahmudul and his resaerch colleagues [20] and Hoddinott and Kinsey [21]. Noticed to extensional-educational factors is very important. The managerial factor is one of the important components in Design of AASN. This finding also pointed out by Birner and his research team members [22]

and Anderson [8]. The finding about policy-making factors accordance with those finding reported by Safarzadeh [18], Beglarian and his coworkers [19], Birner and his colleagues [22] anderson [8] and Sadighi [36]. The finding regards to socio-cultural factors which was accordance with those of authors such as Ahmadi [23] and Labarathe, [24]. Additional finding about infrastructure factors were in accordance with those of reported by Anderson and Feder [25], Rivera and Alex [26], Saravanan [27] and Qamar [28].

CONCLUSION

Development of resource productivity in agriculture sector requires increasing in knowledge and skills of managers and agricultural producers. Success and effectiveness of an extensional system has been directly affected by access to agricultural experts. AAS defined as services that provide new knowledge for farmers and help them to develop their farm management skills. These services include: publishing and distributing information, delivery advices to farmers, testing new techniques in farms and also development of farming management tools. Agricultural advisory services companies (private sector Iran) were established in Iran for creating a way to overcome problems of public extension. Distributing information and providing specify advises to farmers will enhance the quality and quantity of agricultural production. Developing advisory organizations could help to achieve this goal. But For access to these goals, establishing of advisory companies should be set up on affective mechanisms. The role of this factors improving the effectiveness of advisory services. But AASC in Iran's agricultural sector is still in the early stage of adoption by farmers. For example AASC must acquire trust of farmers having efficiency and effectiveness of their advice. Also policy-makers must be suitable approach to AASC among agriculture sector in Iran and invitation of organizations and institutions for cooperation with each other. It is clear that many factors exist to acceptance and application of agricultural advisory by farmers. For access those goals, finding influencing factors for design of agricultural advisory services is necessary. This study found some of factors including such as, economical, extension-educational, managerial, policy-making, socio-cultural and infrastructure. These factors could predict the high level of effectiveness of AASC. Then policy-makers should pay attention and notice to these mechanisms in design of the model of AASC in Iran.

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