Analyzing the Social Capital of Actors and Information Sources of Agricultural Innovation systems in Adopting Innovations by Farmers: An investigation in the Shabestar Township of the East Azarbayejan Province

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Abstract: *this study is to investigate the social capital of actors and interpersonal information, as well as their role in facilitating and diffusing agricultural innovations. This cross-sectional research as a correlational- descriptive study utilized structured interviews using a questionnaire (having been reliable and validated) to collect data. Using a randomized sampling technique in the Sis County located in the Shabestar Township of the East Azarbayejan Province, a sample of 155 out of 260 farmers being members of different local institutions were selected. The data were analyzed using descriptive statistics and correlational path analysis by the SPSS software.. The path analysis also highlighted that the social capital of the actors including opinion leaders, agricultural extension agents, and farmers' family and peers had the most influence on adopting agricultural innovations by the farmers.*

Keywords: Social capital, diffusion, adoption, agricultural innovation, East Azarbayejan.

1. Introduction

In survey of diffusion process innovations and new technologies are identified, the majority of new information technology (IT innovative science or indigenous) is transferred from farmers associations and other actors and the important thing of this process is trust, which farmers together and other elements of diffusion should be have.

Can be said to define of innovation, innovation is ideas, methods, object or thing that it is considered new from the perspective of a person. Communication is the process by which messages are transmitted from the source to the receiver. diffusion is a special type of communication process, which is diffusion messages and new ideas. The main elements in the diffusion of new ideas include: 1) innovation, 2) the specific channel 3) at the time 4) between or among members of a social system is disseminated [3].

Coleman (1990) defines social capital as social relations, as assets or resources that are and facilitate actions by individuals in a social system. Putnam defines social capital in 1993 for reference to features of social organization such as trust, norms, and networks that are this feature can efficiently facilitate community through coordinating, promoting and improving [1].

Coleman (1998) focuses on the application of social capital and social capital definition and say that social capital is a series of different entities, with two common features: First, that all aspects of the social structure and other actors that they facilitate certain actions are within the structure. however social capital, like other forms of capital is manufacturer, but unlike them, the structure of relations between actors, there is a natural [2].

According to Van den Ben, and Hawkins (1996), the actors involved in the innovation adoption process in interpersonal domains are:
1. Farmers (family members, colleagues,
In this study, we will measure social capital friends, neighbors, relatives, innovators and opinion leaders)
2. government companies and their representatives (agriculture ministry, banks and agents)
3. private companies (private companies and their representatives to provider of credit and inputs, including pesticides and fertilizers, and the Buyer Products)
4. The other government agencies, marketing staff and movers
In this study, to measure innovation adoption in rural areas, rate of adoption of five innovations include agricultural inputs, agricultural methods, agricultural machine, medical procedures - Animal health, information and communication technology (ICT) was measured with using 21 items. To measure social capital, the five components of social learning, social partnership, mutual trust, norms and values, social cohesion was used.

and informative resources of innovation system in the agricultural and survey the role of interpersonal relationships and social capital in diffusion of agricultural innovation.

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2. Materials And Methods

This research is a descriptive - correlation. The population of study include farmers of city Shabestar in the sis district. According to the census conducted in 2013, this area has a population of about 5543 peoples and 3845 farmers are working in this area. for improving access the farmers and collect information from all segments of society, 260 farmers were selected as the target population and due to time and cost to all members of the population can be difficult, using Cochran's formula with 95% confidence level (confidence level = 1/96), variance of 0/4 and error of 0/05, 127 members were selected. to increase the accuracy of the results, a sample of 150 farmers was considered.

To gather and measure the parameters of questionnaires and interviews were used. In order to assess its validity, content validity and reliability of the method factor was used. The method of content validity, the questionnaire by experts and professors were interested in promoting the reformation of the questionnaires were applied. to assess the reliability of the questionnaire using Cronbach's alpha coefficient was calculated from the responses given, considering the high validity and reliability of the questionnaire(0.731)was approved.

Item analysis of results, using statistical method of path analysis, was performed using SPSS software. The independent variables in this study included six variables, the social capital of opinion leaders, family and colleague of farmer, the government agent, innovative farmers, government companies and private companies as actors in the agricultural innovation system are combined to form a structure was considered. The adoption of innovations by farmers, is the dependent variable, the effect of six independent variables listed on it are analyzed.

3. Path Analysis

Simultaneous or concurrent to evaluate the effect of independent variables (social capital of actors in the agricultural innovation system) on the dependent variable (innovation adoption) path analysis and multiple regression (ENTER) was used and the relationship between the independent variables of theoretical and conceptual ability had an impact on the dependent variable, were analyzed using path analysis. Next, the relationship between each of the independent variables were examined due to other factors, the direct and indirect effects of variables are examined.

Table 1 shows the results of this analysis, Fisher's exact test with a numerical value of 10/58 was quite significant at the 99% level, indicating a significant difference in the relationship between the independent variables and the dependent variable. R^2 refers to the suitability of the model. The numerical value of 0/475 expresses the average amount of variance in the dependent variable that is explained by the independent variables entered in the model and suggests that the 47/5% of

the total variability of dependent variable explained by the model of this research.

Table 1: Multiple regression analysis to identify factors affecting the adoption of innovations by farmers

variables	B	Std. Error	Beta	t
Constant	10.139	3.600	-	2/817**
Social capital of private companies	0.033	0.132	0.028	0/246 ns
Social capital of Innovative farmers	0.06	0.123	0.057	0/491 ns
Social capital of government companies	0.118	0.135	0.112	0/875*
Social capital of government agent	0.245	0.167	0.198	1/471
Social capital of family, colleagues and friends of the farmer	0.269	0.162	0.223	1/662**
social capital of opinion leaders	0.843	0.170	0.701	4/974**
	$R^2 = 0.475$	F= 10.58**		

* Significance at $p < 0.05$, ** Significant at $p < 0.01$

social capital of private companies and social capital of innovative farmers have a non-significant effect to adoption of innovations. non-significant effects dotted lines indicate are specified in the path analysis model. Some of the independent variables entered into the model itself is influenced by other factors, through multiple regressions Enter, the effects of these factors were studied and the results are shown in figure 1.

Assessing the impact concepts through independent and adoption of innovations by farmers, based on theoretical models, diagram of research following was drawn (figure 1) .

To measure the impact of each variable on the adoption of innovations, direct and indirect effects of each factor was evaluated separately. According to table 3 social capital of opinion leaders with impact factor of 0/821, social capital of the government agent with impact factor of 0/434, and social capital of colleges of farmer with an impact factor of 223/0 to have the greatest impact on the adoption of innovations by farmers.

It is also important to note that at social science researches, identify all the possible causes of a phenomenon is impossible
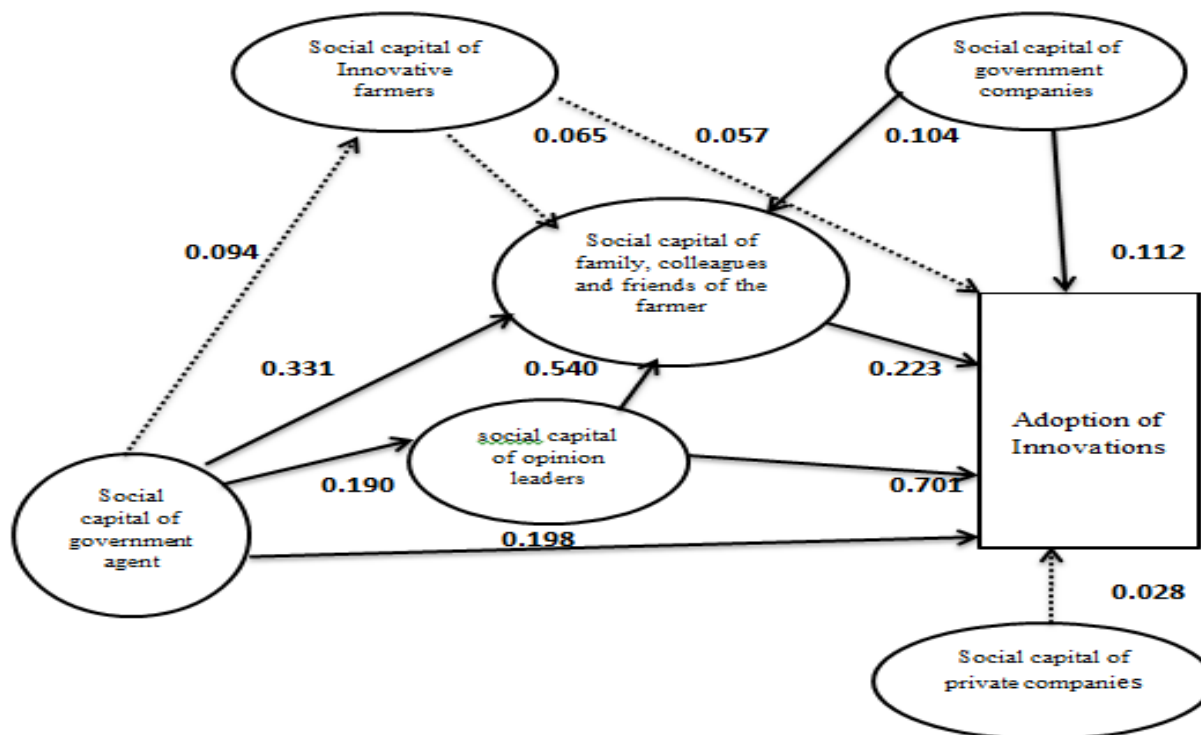
Figure 1: Path analysis to determine the relationship between the independent and dependent variables

Table 2: illustrate the direct and indirect effects of independent variables on the final concept research (innovation adoption)

Variables	Direct	Indirect	Total
Social capital of private companies	0.057	0.014	0.071
Social capital of Innovative farmers	0.027	_	0.027
Social capital of government companies	0.112	0.023	0.135
Social capital of government agent	0.198	0.236	0.434
Social capital of family, colleagues and friends of the farmer	0.223	_	0.223
social capital of opinion leaders	0.701	0.120	0.821

4. CONCLUSION

With regard to the influence of opinion leaders, agricultural extension can also create a stronger relationship with them, especially through agricultural extension agents and agricultural innovation system network between actors in order to facilitate agricultural innovation to help farmers said.

Given the profound role of direct and indirect government agricultural extension agents in the innovation adoption and impact of this group on the most activists admissions process. With in-service training courses and create facilities for the Group in the area of service can be promoted adoption of

innovations. While promoters of the public can again be emphasized that private institutions have failed their trust and relationship between the farmer to raise. So the government is still weak promoters may cause damage to the country's small farmers and social science will be.

The Ministry of Agriculture is required to define the private sector for agricultural innovation in a pluralist system, which along with other social actors, including civil society and the public sector pay to facilitate innovation in the agricultural. It requires much effort to build relationships with various private institutions, farmers and rural communities to build confidence and social normalization.

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