ORIGINAL ARTICLE

Innovation Management in Agricultural Cooperatives of Iran

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ABSTRACT

The major purpose of this study was to identify challenges and requirements in application of innovation management in the North Khorasan Province. The total population of the study was 50 managers of agricultural cooperatives in North Khorasan province. The data was collected by using questionnaire through using interview method. Based on the finding of this study, the requirements were categorized into four groups, namely policy making, psychological, cultural and social factors ordered by the magnitude of their impact. The results revealed that four factors containing 14 variables determined about 87 percent of total variance in requirements necessary for application of innovation management in agricultural cooperatives. The policy making factor with more than 50 percent of total variance was the determined the most important factor contributing to application of innovation management.
Keywords: *Cooperatives, Innovation management, Iran, North Khorasan*

INTRODUCTION

United Nations declared 2012 the International Year of Cooperatives in order to raise awareness of the important contribution of cooperatives to global socio-economic development [1]. The first cooperative was established more than 150 years ago and about 800 million people are members of cooperatives in 100. In defining cooperative, one has to distinguish between profit and non profit organizations. Somerville refers the cooperative as a profit driven membership organization [2]. Based on definition by Falco et al. cooperative is a nonobligatory group of individuals who take mutual decisions in order to gain profits in coordinated activities [3]. Hosseini et al citing USDA defined cooperative as user driven business that has contributed to the development of agriculture sector [4, 5]. Innovation is considered as an important tool in relation to changes in an organization. Damanpour defined innovation as a mean of changing an organization in response to changes externally or internally [6]. Innovation is a complex process, based on interactive network learning and processes of trial and error on the shop floor. Small companies, such as in agriculture, are depending on external knowledge infrastructures for effective innovation [7]. Shumpeter was among the first who introduced the concept of innovation in 1930s. He defined innovation in a way to introduce new products, new production methods and new ways of organizing enterprises [8]. Despite an important role that innovation has in success of cooperative and improving its efficiency, only a small number of cooperatives have been able to manage the innovation and overcome the challenges. Managers play an important role in adopting innovation and success of innovation depends upon competency of managers [9]. The constant failure rate of new product introductions in the last decades implies that little progress in innovation management can be witnessed. Innovation management is seen as an activity in a multi-level system. These trends are inter-related in a complex way and, as a result, the focus in innovation management should be on the combined effect of these trends and on the events that could destabilize the entire system [10]. Soltani and Hosseini citing Cronquist et al indicated that organizational innovation is a broad concept that encompasses strategies, structural and behavioral dimensions. Organizations must change in order to survive [11, 12]. Asenso Okyere et al discussed the issue of innovation in agriculture sector and they concluded that innovation is combination of new knowledge and technologies related with producing, processing and commercializing

agricultural commodities. These types of innovations have been influencing productivity and competitiveness among different groups of rural population [13]. Agricultural innovation has three elements: idea, entrepreneurship and investment. Beside these three elements, appropriate policies are necessary to empower rural population in order to be innovators and entrepreneurs [11]. Giannakas and Fulton examine an open-membership, input-supplying cooperative (co-op) that maximizes member welfare and finances its innovation activity through retained earnings. The results show that the presence of the co-op can increase the arrival rate of innovations while reducing the price of agricultural inputs. Cooperative involvement in innovation activity *can* thus be welfare enhancing and socially desirable with its effectiveness being determined by the degree of producer heterogeneity and the size of innovation costs [14]. Hosseini et al. in a study about role of managers in technological innovation in small food industries in rural areas of Iran concluded that the main source of innovation was top management and senior managers and board directors were found to be the principle sources of the new ideas that led to innovations [4]. The purpose of this research is to determine the challenges and requirements in application of innovation management in agricultural cooperatives in North Khorasan Razavi of Iran.

MATERIAL AND METHODS

This was an applied type research and survey method was used to collect the data. The total population of the study was 50 managers of agricultural cooperatives in North Khorasan province. Based on the latest formal national statistics by the Statistic Center of Iran the total population of this province was 811572 persons. It was reported that slightly less than 60 percent of population live in rural areas and compare with average number for country which is 31 percent, it is a significant number. Of those who are considered as an employed individual, more than 31 percent, 40 percent and 28 percent are involved in industry, agriculture and service sectors respectively. The face and content validity of questionnaire was confirmed by faculty members at science and research branch and experts in the department of cooperative of Khorasan Razavi province. The reliability was measured by using Cronbach Alpha and it was determined to be 0.82 which shows the reliability of questionnaire. To determine the appropriateness of data and measure the homogeneity of variables about challenges and requirements in application of innovation management in agricultural cooperatives, the Kaiser-Meyer-Olkin (KMO) and Bartlett's test measures were applied. These statistics show the extent to which the indicators of a construct belong to each other. KMO and Bartlett's test obtained for these variables show that the data are appropriate for factor analysis (tables 1, 2). The Kaiser criterion also was utilized to arrive at a specific number of factors to extract. Based on this criterion, only factors with Eigen-values greater than one were retained.

Table 1: KMO measure and Bartlett's test to assess appropriateness of the data for factor analysis in requirements in application of innovation management

KMO	Bartlett's test	
0.7	Amount	Sig.
	322.60	0.000

Table 2: KMO measure and Bartlett's test to assess appropriateness of the data for factor analysis in challenges in application of innovation management

KMO	Bartlett's test	
0.76	Amount	Sig.
	354.68	0.000

RESULTS AND DISCUSSION

The results of descriptive statistics show that average age of managers were 41 years with average of 15 years of working experience. Majority of respondents had at least a high school diploma (86%). It was reported that 36 percent of managers had a degree in agriculture. In order to determine the current status of innovation management in agricultural cooperatives, the Interval of Standard Deviation from the Mean (ISDM) was used. Twenty percent of respondents indicated that the current status of innovation management in cooperatives was inappropriate while thirty percent indicated that it was relatively inappropriate. The results show that sixteen and nine respondents reported the status of innovation management was relatively appropriate and appropriate, respectively. Table 3 represents components of each requirement, as well as, portions of each it from the total common variance. As one may observe,

about 87.78% of total common variance is explained by these four factors, where the majority of it has been explained by the policy making factor.

Table 3: Number of extracted factors, eigen-values and variance explained by each factor

Factors	Eigen-value	Variance	Cumulative variance
Policymaking	5.70	27.0	50.48
Psychological	4.20	19.6	70.08
Cultural	2.01	9.90	79.98
Educational	1.70	7.80	87.78

The varimax rotated factor analysis for requirements is shown in tables 4. In determining factors, factor loadings greater than 0.50 were considered as to be significant. As anticipated, the first factor accounts for 27.0 percent of variance and 5 variables were loaded significantly. Eigen-value of this factor is 5.70, which is placed at the first requirement in application of innovation management in agricultural cooperatives of Iran. The second factor contains 4 variables relating to "psychological factor". The eigen-value for this factor is 4.20 which explain 19.60 percent of the total variance. The name assigned to the third factor is "cultural factor". This factor with eigen-value of 2.01 explains 9.90 percent of the total variance of factors influencing the application of innovation management in agricultural cooperatives. The last factor contains 2 variables relating to "educational factor". The eigen-value for this factor is 1.70 which explains 7.80 percent of the total variance.

Table 4: Variables loaded in the factors using varimax rotated factor analysis

Factors	Variables	Factor Loadings
Policy making	Supporting innovative and creative cooperatives Relevant rules and regulations Providing resources to cooperatives Providing grounds in an environment for competition Establishing networks supporting innovators	0.824 0.716 0.625 0.603 0.595
Psychological	Self Confidence Accepting risks by managers Accepting responsibilities by managers Enhancing linkages between managers and members	0.904 0.752 0.723 0.569
Cultural	Availability of innovation cultures in cooperatives Increasing motivation among members to offer innovative ideas Mutual confidence between members and managers Establishing web sites about nanotechnology in agriculture	0.842 0.739 0.712
Educational	Providing relevant training about innovation management Access to educational materials about innovation	0.732 0.688

Table 5 represents components of each challenge, as well as, portions of each it from the total common variance. As one may observe, about 57% of total common variance is explained by these four factors, where the majority of it has been explained by the cultural factor.

Table 5: Number of extracted factors, eigen-values and variance explained by each factor

Factors	Eigen-value	Variance	Cumulative variance
Cultural	3.70	19.6	19.60
Regulatory	2.80	14.8	34.40
Informative	2.70	14.2	48.60
Psychological	1.60	8.40	57.00

The varimax rotated factor analysis for challenges is shown in tables 6. In determining factors, factor loadings greater than 0.50 were considered as to be significant. As anticipated, the first factor accounts for 19.60 percent of variance and 4 variables were loaded significantly. Eigen-value of this factor is 3.70, which is placed at the main challenge in application of innovation management in agricultural cooperatives of Iran.

Table 6: Variables loaded in the factors using varimax rotated factor analysis

Factors	Variables	Factor Loadings
Cultural	Lack of trusts among members and managers Lack of participation Lack of competitive environment Lack of support for offering innovative ideas	0.772 0.754 0.667 0.659
Regulatory	Lack of adaptability of organization with innovation Lack of cooperation among relevant organizations Large number of decision making bodies in regard to cooperatives	0.827 0.715 0.537
Informative	Weak linkages between industries and educational institutions Lack of access to research institutions	0.677 0.628
Psychological	Low motivation among managers to offer innovative ideas Inability of managers to accept risks Uncertainty about success of innovative ideas	0.794 0.728 0.663

The second factor contains 3 variables relating to "regulatory factor". The eigen-value for this factor is 2.80 which explain 14.80 percent of the total variance. The name assigned to the third factor is "informative factor". This factor with eigen-value of 2.70 explains 14.2 percent of the total variance of challenges in application of innovation management in agricultural cooperatives. The last factor contains 3 variables relating to "psychological factor". The Eigen-value for this factor is 1.60 which explains 8.40 percent of the total variance.

Based on the finding of this study, the requirements were categorized into four groups, namely policy making, psychological, cultural and social factors ordered by the magnitude of their impact. The results revealed that four factors containing 14 variables determined about 87 percent of total variance in requirements necessary for application of innovation management in agricultural cooperatives. The policy making factor with more than 50 percent of total variance was the determined the most important factor contributing to application of innovation management. The results of studies by Passel et al; Soltani and Hosseini; Karami and Rezaei Moghaddam and Shabanali Fami et al confirmed the findings of this study [15, 11, 16, 17]. In assessment of challenges affecting the innovation management in agricultural cooperatives, cultural, regulatory, informative and psychological factors explained 57 percent of variance and cultural component with 19.6 percent of total variance was found out to be the main challenges in application of innovation management. This result echoes the findings of Soltani and Hosseini and Latifian [11, 18].

CONCLUSION
The findings revealed that self confidence of managers had the highest factor loading in variables influencing application of innovation management, so it is important to enhance the self confidence and ability of managers to offer and support innovative ideas in managing the cooperatives. Based on the results of the study, lack of adaptability of cooperative with the highest factor loading was determined to be the main variable in challenges in application of innovation management. Therefore, government should approve policies and provide cooperatives with motivation which make them more effective in a new environment.

AUTHORS' CONTRIBUTIONS
Author SJFH designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Author ND managed the analyses of the study. 'Author AR managed the literature searches. All authors read and approved the final manuscript."

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