Exploring the Solutions for Overcoming Challenges Facing Peasant Farming System in Iran

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Abstract

Vast majority of Iranian farmers are still peasants who farm small plots of land, usually in marginal environments, utilizing traditional and subsistence methods. Despite of these characteristics, peasant-farming system has vital role in Iranian agriculture sector. Solutions therefore must be found for empowering peasants to deal with such problems. The main purpose of this study was to identify solutions to deal with challenges facing peasant farming system in Iran. Seventy one extension experts at headquarter level of Ministry of Agriculture were selected using random sampling technique. Principal component analysis was applied as main statistical technique to analyze the data. The findings revealed that five factors /components containing 38 variables determined about 63 percent of variations in solutions to deal with challenges facing peasant farming system: extension solutions (19.03 % of variance), economic solutions (16.60% of variance), social solutions (10.234% of variance), political solutions (9.75% of variance) and managerial solutions (7.69% of variance).

Keywords: Challenges, Farming systems, Iran, Peasants, Solutions

1. Introduction

About 2 billion rural individuals live in agricultural systems associated with high amount of risk and low levels of yield in Asia, Africa and Latin America. They mostly farm in poor soils, hillside slopes, or arid dry lands influenced by erratic rainfall and periodic drought (Gubbels, 2000). Such lands therefore cannot be classified as agricultural lands (Goltenboth and Hutter, 2004). Peasantry systems are the primary source of staple food in developing countries, and it is estimated that 1.5 billion people earn a livelihood from such activities (chambers, 1994; Rosset, 2001; Lo' pez -Ridaura et al, 2005). The vast majority of this immensely large group of undernourished people depends primarily on agriculture to provide most of their own food supplies and any cash income needed to purchase goods and services. Even with dramatic increases in nonfarm economic activity, agriculture will remain central to secure livelihoods (Gubbels, 2000).

In the context of the review a 'peasant farmer' is a farmer practicing a mix of commercial and subsistence production where the family provides the majority of labor and the farm provides the principal source of income (Cornish, 1998). Most of peasants have small production units and high marginally indexes (Soto-Pito, 2007).

Peasant farming systems have low amounts of land available and rely mainly on off-farm income (Mergenthaler, 2003).

In contrast to commercial farming systems, peasant-farming systems are mostly without much external inputs, especially if they face very high input prices, for instance, of energy (Ellis, 1993).

Peasant family despite its relatively weak socio-economic and political leverage over central policy; it is the most self-sufficient small unit (Kanogo 1987; Lado, 1997; Cleophas, 1997). In peasant family the production goals are centered on two types of demands: consumption demand defined by the household physiologic density, and market demand for commodity production (Boserup, 1965; Chayanov, 1966; Ali, 2005).

The peasant model of production is characterized by a rudimentary division of labor. Since there is no product specialization, very little exchange between the various units of production takes place (Hyden 1983; Ankoma 1990; Darkoh 1989). In addition, differences in income and levels of wealth are significant within communities (Crehan, 1992; Negassa, 2001). There is no structural interdependence bringing them into reciprocal relations with each other thus leading to the development of the means of production. Indeed, the peasant mode of production does not develop the social forms of labor which lead to the socialization of production (Hyden 1980, 1983; Lado, 1997).

Different studies have emphasized one factor over the others in determining differentiation. Hoben (cited in Teferi, 1998) argued that land was the essential factor of production in northern Ethiopia between peasantry. In contrast, Teferi (1998) has pointed out that differences in economic status among households in southwestern Wollo are correlated with differences in available household labor supply. McCann (1995) argued that oxen should be considered as a consummate form of capital and often it is the scarcest economic resource as well in the highland rural economy. It also structure inter-household relations within local communities and economies. Yared (1999), on the other hand, showed oxen and other livestock as the most important form of household wealth mediated by the size of household land holdings (Negassa, 2001).

It has become a widespread assumption in peasant studies that there is a general inclination of peasant to plan their farming activities with an eye to risk spreading at the expense of profit maximization (Wolf, 1966; Ruthenberg, 1971; Shanin, 1971). seen from the position of the market, peasant strategies of risk spreading have been labeled 'sub optimal' since a certain degree of risk taking might increase the marginal output of land as well as the labor in normal years (Turner and Brush, 1987; Griggs, 1995). From the perspective of the peasant household itself, however, such a strategy, given climate uncertainly, the possibility of crop diseases, and unpredictable market prices, is optimal particularly when state insurance in case of crop failure is negligible. The peasant household is, in the last instance, the architect or its own fortune and risk spreading is a vital part of that design (Aase and Vetaas, 2007).

1.1 Challenges of peasant farming system

In this section, challenges facing peasant farming systems in developing (with emphasis on Iran) and developed countries are explained separately.

1.1.1 Developing countries

Smallholder face a number of difficult challenges, including an increased demand for cash income to pay for services previously provided by the state; a growing emphasis on the production of commodity crops; and a land tenure system that creates uncertainty about future access to farmland. Farmers in less developed regions, where infrastructure is poorly developed and access to markets is limited, must often find their own solutions to their economic problems (Tilt, 2008). In addition, productivity in these areas is low and families are often forced to supplement farm incomes from other livelihood activities. Decisions will depend on perceptions of risk and the potential returns, as well as local tradition and culture (Twomlow et al, 2002).

There is evidence that poor peasant farmers are risk averse (Moscardi and de Janvry 1977; Dillon and Scandizzo, 1978; Binswanger, 1980, 1981, 1982; Binswanger and Sillers, 1983), and that their production and economic environment is characterized by a high degree of uncertainty (Roumasset, 1976). Risk and risk aversion have been used as a main explanation why peasants produce less than the level that maximizes expected profits (Wik and Holden, 1996). Mechanization in the smallholder system is minimal (Gale 2002). Mechanization is particularly impractical, where population pressure is high and land plots are small, steeply graded and terraced (Lo' pez -Ridaura et al, 2005). In many situations the opportunity cost of money for smallholder is high whilst that of labor and traditional skills is low.

Ashrafi et al (2007) in their study in Iran have enumerated several characteristics which germane to peasant farming system e.g. lack of control over water use, land fragmentation, difficulties in transferring inputs to

farmlands and also in transferring products to markets, low level of mechanization, low financial power, farmers' unawareness about modern technologies, high illiteracy rate, low access to modern technologies, human resource erosion, application of traditional methods for cultivation, risk aversion, low access to credits, exploitation of natural resources due to farmers' unawareness, low productivity rate etc. Fami et al (2009) in their study classified the challenges of Iranian peasantry in five factors including technical-technological, managerial, economic-financial challenges, marketing-infrastructural challenges, and spatial-geographical challenges.

1.1.2 Developed countries

At first, it should be mentioned that peasant systems similar to such systems in developing countries is very rare in developed countries. However, most peasant systems are, on contrary, productive despite their low use of chemical inputs. Generally, agricultural labor has a high return per unit of input (Pimentel and Pimentel, 1979).

1.2 Solutions for peasant challenges

Empirical evidences suggest that small farms are desirable not only because they reduce unemployment, but also because they provide a more equitable distribution of income as well as an effective demand structure for other sectors of the economy (Bravo-Ureta and Pinheiro, 1993, 1997; Binam et al, 2004). A salient feature of traditional farming systems is the degree of plant diversity patterns (Chang, 1977; Clawson, 1985; Thrupp, 1998). The commercialization of food consumption encourages smallholders to specialize in particular commodities and forge new links with processing and distribution networks (Gale, 2002; Huang and Rozelle, 1998; Tilt, 2008). Peasant farmers' withdrawal or brief political explosions can produce some episodic impact at the national level, but the tactics are as much an admission of political impotence as an assertion of strength (Graaff, 1996; Le Roux, 1996).

As rural population pressures increase, crop and livestock production become integrated in order to intensify output. Mixed farming systems provide farmers with an opportunity to diversify risk from single crop production; to use labor more efficiently; to have a source of cash for purchasing farm inputs; and to add value to crops or their by-products (De Haan et al., 1997). Even then, most of the available studies failed to relate farm household resources to economic outcomes in their analysis framework. Consequently, the implications of the results were rather generic in terms of recommendations for technology transfer. Farmers can then smooth the flow of income to the household through making conservative production choices, combining production enterprises, and diversify economic activities.

It is further argued that this diversity stems partly from the differences in the material conditions and the production relations, and that a diversified range of technical options are required to suit the needs of farmers with different resource endowments and management skills (Williams et al., 1999). In theory, smallholder productivity can be increased through the implementation of a mechanization strategy that includes engine and muscle power sources. Whilst this would be expected to demand additional tools and higher costs, there is a strong economic argument for such investment in order to achieve greater returns. However, social and cultural factors are at least as influential as economic factors and few imposed mechanization programs in developing countries agriculture have had successful outcomes (Twomlow et al., 2002).

On other hand one of reasons about the low technical efficiency of small exploitability's is the low amount of investing in creating of substructures especially in providing farming water (Rios, 2005). If more sources are invested in extension services, accessibility to credibility is improved, and scattering of farms be less so, technical efficiency improvement in farmers will result (Obwona, 2006). For helping to small farmers' prosperity under globalization process, governments have to change some of their tendencies. For example, innovative land reform is essential for legal security of these kinds of farmers and increasing of their farm's size. In addition to these reforms of public organizations to helping the peasants for accessibility to credibility, marketing and innovation have importance and the variety of valuable productions can have an important role in their income increase (Shenggen and Chan-kang, 2005).

1.3 Agriculture in Iran

Agriculture is one of the most important economic sectors of Iran. Its contribution to GDP is approximately 27 percent, in employment is 23 percent (employed 3.5 million people) and its share in non-oil exports is 24 percent. In recent years, the agriculture sector has shown a significant development potential. It can meet 85 percent of Iran's food need and 90 percent of the raw material need of its food processing industries. Therefore, the agriculture sector has the most important place in the macroeconomics in Iran (Kalantari and Abdollahzadeh, 2008; Fami et al, 2009).

The 2004 public agricultural census revealed that from the total number of 3,473,383 of farming plots owned by farmers, 3011461 (86.7 percent) of them are less than 10 hectares from which 34.62 percent have had less than 1 hectare (Ashrafi et al, 2007; Fami et al, 2009; see Table 1).

2. Materials and methods

2.1 Case study

The present study was carried out in Iran to identify main challenges of peasant farming system from the viewpoints of extension experts working at the headquarter level of the Ministry of agriculture in Tehran. Having knowledge and information or practical experience on challenges facing Iranian peasant farming system was considered as a criterion for selecting these respondents.

2.2 Sampling method

Applying random sampling technique, 71 staff extension experts were selected and interviewed. The data were collected through a well-structured questionnaire.

2.3 Questionnaire structure

Data were collected through face-to-face interviews with respondents based on a structured questionnaire. The questionnaire was based on the published literature on related topics in Iran and other countries.

To evaluate face and content validity of the instrument, the questionnaire was assessed through expert judgment. It was modified according to comments and suggestions of the early respondents. Cronbach's alpha coefficient, a measure of internal consistency, was used to estimate the reliability of the survey questionnaire. This coefficient ranges in value from 0 to 1 and it describes the reliability of factors extracted from dichotomous or multi-point formatted questionnaires or scales. Cronbach's alpha coefficient was found to be 0.93 for main scale of the questionnaire indicating an acceptable level of reliability (Nunnally, 1978). The researchers received formal permission to collect data through the Ministry of Agriculture in Tehran, and a formal letter of introduction and permission to proceed was provided.

The questionnaire was composed of parts including peasants farming system challenges, solutions to deal with them and respondents' personal characteristics.

Besides closed questions, free space for comments or alternative answers was also included.

2.4 Statistical analysis

In this research, descriptive and inferential statistics were used to analyze the collected data. Descriptive statistics included frequency values and inferential statistics included exploratory factor analysis technique. The main objective of this technique is to classify a large number of variables into a small number of factors based on relationships among variables. For this purpose 38 variables were selected for the analysis. To determine the appropriateness of data and measure the homogeneity of variables on solutions for overcoming peasants' challenges from the viewpoints of extension personnel in the Ministry of Agriculture, 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 as indicated in Table (2). The Kaiser criterion also was utilized to arrive at a specific number of factors to extract. Based on this criterion, only factors with eigenvalues greater than one were retained.

3. Results and Discussion

In current study, 38 variables were significantly loaded into five factors. These factors explained 63.324 percent of total variance in solutions for overcoming peasant farming system challenges. According to the Kaiser criterion, five factors with eigenvalues over one were extracted. The eigenvalues and percentage of variance explained by each factor are shown in Table 3. Eigenvalues drive the variances explained by each factor. Sum of squares of factor's loadings (eigenvalue) indicates the relative importance of each factor in accounting for the variance associated with the set of variables being analyzed. According to Table (3) eigenvalues for factor 1 through 5 are 7.231, 6.311, 3.889, 3.707 and 2.924, respectively.

The percentage of trace (variance explained by each of the five factors) is also shown in Table (3). The traces for factor 1 through 5 are 19.030, 16.609, 10.234, 9.756 and 7.694 respectively. The total percentage of the trace indicates how well a particular factor solution accounts for what all the variables together represent. This index for the present solution shows that 63.324 percent of the total variance is represented by the variables contained in the factor matrix.

The Varimax rotated factor analysis is shown in Tables 4-8. In determining factors, factor loadings greater than 0.63 were considered as to be significant. As anticipated, the first factor accounts for 19.030 percent of variance and 8 variables were loaded significantly. These variables were presented in Table (4). A relevant name for this on loading's pattern is "extension solutions". Eigenvalue of this factor is 7.231, which is placed at the first priority among the solutions for peasant farming system in Iran.

The second factor is associated mostly with the variables related to economic solutions. Thus this factor can be named as "economic solutions". The eigenvalue for this factor is 6.311 which explain 16.609 percent of the total variance (Table 5).

The name assigned to the third factor is "social solutions". This factor with eigenvalue of 3.889 explains 10.234 percent of the total variance of peasant farming system solutions (Table 6).

The fourth factor contains 9 variables relating to "political solutions". These variables explain 9.756 percent of total variance (Table 7).

The fifth factor is associated with the variables related to managerial solutions. Thus, this factor can be named as "Managerial solutions". The eigenvalue for this factor is 2.924, which explain 7.694 percent of the total variance (Table 8).

4. Conclusions

About 87 percent of the farming systems in Iran are peasantry that these facing by many problems such as fragmentation of land, low production efficiency, and the existence of hidden unemployment, illiterate and lack of access to inputs and agricultural credits. To develop agriculture sector therefore solutions for overcoming these challenges is crucial. According to the results, one of these solutions is a solution that cited in education and extension solutions. This solution include increasing farmers' skills, empowerment among peasants, revolution of science and culture in social and economic exploitation, marketing knowledge and improvement of farm management among farmers through education. The second solution that offered is consisted payment with low-interest and long-term facilities, guaranteed purchase of agricultural products, payment of government subsidies to farmers and insurance services that these are have brought among economic solution. Social solution that was third factor includes solutions that offered integration and creation of land and cooperative development between farmers. The solution was named the fourth solution to items such policy to prevent land being made through new laws and create the necessary infrastructure in rural government and build resolve policy barriers to create powerful agricultural organizations were considered. The management strategy as the proposed solution were presented in the fifth to solve problems such as making optimum use of existing equipment and inputs and the use of modern methods to suit each region has been emphasized.

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		Less than 1 hectare	1-2 hectare	2 -5 hectare	5-10 hectare	10-50 hectare	50-100 hectare	More than 100 hectare	total
exploitation	number	1202503	522273	796108	490587	429516	24006	8340	3473383
	percent	34.62	15.04	22.91	14.12	12.36	0.69	0.24	100
Agriculture	number	407070	655129	2377091	3230892	7534612	1547657	1922747	17665198
land	percent	2.3	3.71	13.46	18.29	42.6	8.76	10.83	100

Table 1. Number of exploitations and agriculture land in Iran in 2004

Source: Iran statistical center

Table 2. KMO measure and Bartlett's test to assess appropriateness of the data for factor analysis

КМО	Bartlett's test of sphericity			
0.750	Approx. chi- square	Sig.		
0.750	1850.905	0.000		

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Factors	Eigenvalue	% of variance	Cumulative % of variance	
1	7.231	19.030	19.030	
2	6.311	16.609	35.639	
3	3.889	10.234	45.873	
4	3.707	9.756	55.629	
5	2.924	7.694	63.324	
2 3 4 5	6.311 3.889 3.707 2.924	16.609 10.234 9.756 7.694	35.639 45.873 55.629 63.324	

Table 3. Number of extracted factors, eigenvalues and variance explained by each factor

Table 4. Variables loaded in the first factor using varimax rotated factor analysis

Name of factor	Variables loaded in the factor	Factor loadings
	Farmer's training for increasing their skills for optimum using of	0.626
	production sources	
	empowering and capacity making in peasant social by providing	0.727
	proper trainings	
	Preparation agriculture's researching, training and extension for	0.793
	transferring last data	
extension	Creation mutation in culture and know ledge public and economic	0.795
solutions	agricultural exploitations by training	
	Increasing in marketing knowledge among farmers by training	0.746
	Training correct methods about farm management	0.625
	Empowering woman farmer in peasant faring by training	0.723
	Performance training programming about conservation of natural	0.725
	resources in peasant farming system	

Table 5. Variables loaded in the second factor using varimax rotated factor analysis

Name of factor	Variables loaded in the factor	Factor loadings
	Payment low interest rate and long-term credits	0.801
	Guaranty purchase of agricultural surplus productions of peasant	0.763
	farmers	
Economia	Payment of governmental subsides	0.764
solutions	Exploitations economic empowerment with performance	0.680
solutions	insurance services	
	Help to farmers about productions marketing	0.613
	Endowment subsides for productions insurance or actions in	0.707
	peasant farming system	

Table 6.	Variables	loaded ir	the third	factor	using	varimax	rotated	factor	analysis

Name of factor	Variables loaded in the factor	Factor loadings
	Easing qualification and rule for establish plural farming	0.799
	systems by aggregation of peasant farmers	
	Aggregation peasant farming system in cooperation units	0.725
	Regarding to collective exploitations of machinery instead sporadic exploitations	0.701
	Organized exploitations in traditional cooperation's in various	0.868
Social solutions	themes as production, distribution, marketing and consumption	
	Organized farmers in traditional institutions	0.719
	Creation linkage between farmers and various markets by	0.634
	means of cooperation's	
	Revival partnerships moral among peasants	0.768
	Creation a proper plural farming system with regarding to	0.743
	culture values in each region	

Table 7. Variables loaded in the forth factor using varimax rotated factor analysis

Name of factor	Variables loaded in the factor	Factor loadings
	Development traditional and small industries for creation	0.610
	complement engagement	
	Land consolidation	0.695
	Performance supportive services for producers	0.605
	Restriction of land fragmentation due to creation preventive	0.716
	legislations	
	Implement development, infrastructural and service projects by	0.612
Political	farmer's partnerships	
solutions	Development productions agricultural processing industries for	0.666
	increasing production's added value	
	Preparation on-time inputs and providing necessary resources for	0.695
	farmers	
	Creation opportunity farmers partnership in design making due to	0.612
	organized farmers NGOs	
	Restriction of change in land use system among farmers in this	0.761
	system	

Table 8. Variables loaded in the fifth factor using varimax rotated factor analysis

Name of factor	Variables loaded in the factor	Factor loadings
	Human resource management	0.696
	Using of modern production methods proportionate with region condition	0.873
	Using of internal inputs due to reduce the productions cost	0.712
Managerial	Using the modern systems due to incearising efficiency of	0.834
solutions	irrigation	
	Implimentation of breeding schems \	0.842
	Optimum using of available equipment such as machinery	0.806
	Diversification in activities such as mechanism for increasing in	0.807
	profit and reducing in risks	