

Full Length Research Paper

Farmer participation in land consolidation projects in Iran: The case of Shirvan and Chardavol City

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The objective of this paper was to study the factors affecting farmers' participation in the implementation of the land consolidation project in Iran. Required data were collected by a questionnaire and an interview with 137 farmers selected through stratified sampling method from 4 out of 8 rural districts in Shirvan and Chardavol City. The collected data through questionnaires were analyzed through the SPSS software, and the descriptive and inferential statistics were studied using univariate and bivariate analyses. The results demonstrated that the farmers' level of education and their awareness of the concept of land consolidation are the major factors affecting the tendency of land owners to participate in the land consolidation project. The high operational costs of the project are the main deterring factor in its execution.

Key words: Shirvan and Chardavol city, land consolidation, land fragmentation.

INTRODUCTION

While land fragmentation is considered by all experts to be one of the main obstacles for agricultural development, land consolidation is considered as one of its major causative factors. It could reduce the cultivation costs and increase the quantity of agricultural crops which are the main goals set by policy-makers in agricultural sector. Capital return rate has been different in different consolidation projects. The capital return rate was reported to be 6 to 15% in Netherlands and 1 to 22% in Cyprus (Demmen, 2002). The fact that the lands in Iran are small and fragmented has caused the production of agricultural crops in many parts of this country to be done traditionally. It has also made it impossible to optimally take advantage of technology and modern agricultural facilities. On the other hand, as the population is considerably increasing in villages, and in cities relatively too, the traditional production of agricultural crops in the country definitely will not satisfy the demands of the public. The authorities turn to import to meet the existing demands, which cause the country to lose foreign

currency. This deteriorates the social and economic situation of villagers as well. Therefore, as the production of small units does not pay, villagers have to move to urban areas.

As different studies have shown, various factors affect the land fragmentation in Iran. These factors depend on social, natural, economic and physical processes which consist of:

Land reforms

Different countries' historical experiences indicate that land reforms in many countries have caused land fragmentation. This kind of fragmentation involves both the number of productions and the number of fragmented lands meaning that after the reform, not only the number of lands which are fragmented and smaller, but also the number of the cultivators increases (Ahmadi, 2003).

Inheritance

Inheritance, which has social and religious roots in rural

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societies is known as one of the main factors in lands fragmentation, as usually after retirement or death of a farmer, the land would be divided among the heirs.

Transaction

Transaction of land plots among farmers' is one of the factors that can cause more and more fragmentation. However, controlling transactions of lands by enacting rules in order to create bigger lands, we have adopted an effective as well as economical policy to land consolidation (Ahmadi, 2003).

Environmental and ecological factors

Various factors cause fragmentation of farm lands in rural areas including the distance from the road, water availability, soil quality land steepness, height, morphology, land topography and climate (Taghvaei, 1997).

Social and cultural factors

Traditional and religious structure in rural areas of Iran and domination of certain rules like endowment is one of the important social factors affecting land fragmentation (Norouzian, 1998).

Operational and physical factors

Physical factors and human interference in the natural shape of the environment [roads, creek (stream), etc] affect land fragmentation. Studies show that in some areas in Iran, physical factors like 'rotation of crops' according to the climate, the distance between the lands and the village, and hydrologic network have a role in land fragmentation (Ahmadi, 2003). Among the main factors related to functions, we can point out fencing, the diversity of rural residences specially diversity of core type, bridges, canals, rail road, establishing industries and other facilities, change in production method, constructing houses, changing the function of lands from farm cultivation to gardening, etc which are considered as main factors causing land fragmentation (Norouzian, 1998). Amini et al. (2003) did a study with the aim of investigating and comparing the reasons for farmers' disapproval of implementing farm land consolidation projects in Kermanshah city and Lenejat area in Isfahan province. The results of their study indicate that in two areas under study, landholders' ignorance, improper technical methods of project implementation and lack of clear rules related to land consolidation are the main

obstacles for this process. Vosooghy and Farajy (2006) did a case study titled "a sociological study of the factors affecting farmers' willingness to cooperate in farm land consolidation in the villages of Zarrin shahr rural district, Isfahan Province". Their findings indicate that variables of literacy, availability of job opportunities, the amount of land ownership, trust between people, the trust of people in government, and motivational factors have a significant relationship with the dependent variable, namely the amount of land owners' willingness to cooperate in farm land consolidation.

A research done by Gonzalez (2002) in Spain shows that consolidation projects are important paces to improve the efficiency of labor force and optimal use of farm lands. Also, increasing the awareness of farmers about economic and social results of farm land consolidation, giving suitable information to farmers and supporting programs by the government are of the factors facilitating land consolidation. The studies done by Vity (2004) about land consolidation in Europe indicate that the most justifiable reason for the usefulness of land consolidation programs are the increase of plot sizes and the decrease of the number of the plots. The differences between farms regarding how close they are to the roads and the water sources cause a lot of problems in replacing farm lands and their consolidation. A land consolidation project that became successful in Indonesia is what Archer (1992) reported. It shows that the land consolidation project provided valuable benefits and lessons. It demonstrated the feasibility of the 'land consolidation technique' in the Medan context including the preparation of the needed land parcel map of the site and the 90% landowner support for the project. It created a planned layout of roads and public facility sites and reshaped land parcels with the public lands in government ownership and the private land parcels with registered titles. It also provided lessons to guide the future use of 'land consolidation' in Medan and for all urban LC projects. All discussed earlier signifies the significance of choosing a suitable method to improve the situation of farm lands. Taking advantage of a suitable method, we could use the available resources in agriculture sector.

On the other hand, research indicates that accomplishment of any project or program depends on scientific research, and the beliefs and the attitude of the community. This study was carried out with the general goal of studying the role of different factors affecting farmers' participation in implementing the land consolidation project in Ilam province.

METHODOLOGY

In this study, the data were collected by the questionnaires in a 'survey method'. The statistical population consisted of 8099 of farmers inhabiting in Shirvan and Chardavol, Ilam province.

Table 1. Farmers' personal features.

Features personal		Frequency	Percent (%)	Average
Age groups	26-40	33	25.00	47.4
	41-54	60	58.75	
	55-68	22	11.25	
	68-80	17	5.00	
Farming background	5-19 years	23	12.5	30.25
	20-33 years	58	56.25	
	34-47	35	27.50	
	More than 47	16	3.75	
Education level	Illiterate	21	15.90	-
	Read and write	39	29.58	
	Fifth grade	38	28.78	
	Diploma	17	12.87	
	Higher than diploma	17	12.87	

Table 2. Farm land's structural features.

Variable	Owner ship of irrigated farms	Number of irrigated lands	Size of irrigated farms	Owner ship of dry farms	Number of dry farm plots	Size of dry farm plots
Average scale	8.73	5.6	1.4	11.71	4.47	2.81
Deviation	15.82	4.53	8.5	12.73	4.99	3.2
Min.	1	1	.50	0	1	0
Max.	14	15	1.5	80	30	2

Considering the fact that the city is a vast area, 4 out of 8 rural districts located in 3 parts of the city were selected. Using Cochran formula, we estimated the size of the 'statistical sample'. Due to time and financial limitations, 137 farmers were chosen as 'statistical sample' and were given the questionnaires, only 132 of which were usable when returned. Then, they were studied to test the questionnaire's validity. A preparatory examination was done in one of the villages out of the 'statistical population' and the questions were reviewed and reformed. Reliability of factors under study was examined through operational analysis by means of KMO (Kaiser-Meyer-Olkin) factor and its validity was examined by means of Cronbach alpha. Cronbach alpha factor and KMO were calculated as 0.82 and 0.64% respectively.

For analysis of data, apart from several descriptive methods such as mean and standard deviation, Pearson coefficient of correlation and stepwise multiple regression technique were also used.

RESULTS AND DISCUSSION

Farmers' personality

As Table 1 demonstrates, farmers' average age was 47.4, and farmers' ages ranged between 26 and 80. The average number of years farming for the group is 30.25 years. And, approximately, 16% of the 'statistical sample' are illiterate, about 30% have the minimal ability to read

and write, and more than 50% have primary education or higher.

Structural features of farm lands

As you can see in Table 2, on average, about 95% of farmers in Shirvan and Chardaval city are simultaneously engaged with irrigated and dry farming, only 5% of them are doing irrigated farming. The number of 'irrigated plots' is between 1 to 15, average number of which is 5.60 plots and the average size of which is 1.4 ha. The number of 'dry lots' is between 1 and 30, average number is 4.47 plots and the average size is 2.8 ha.

The obstacles for implementing farm land consolidation

The biggest obstacles for implementing farm land consolidation from the view point of farmers are high costs of the project, non-cooperation of Agricultural Service Center, lack of financial support from the government through loans and grants. The least important obstacles are non-cooperation of Water and

Table 3. Obstacles to implement farm land consolidation.

Existing obstacles	Mean	Std. deviation	Range	Grade
High costs of project	2.69	1.098	40.8	1
Non cooperation of service centre	2.54	1.124	45.8	2
Not giving consolidation loan	2.48	1.169	47.1	3
Not consolidate because of big plots	2.14	1.016	47.4	4
Farmers lack of information about consolidation benefit	2.16	1.024	47.4	4
Farmers disagreement with project	2.25	1.097	48.7	5
Not existing people to implement the project	2.28	1.158	50.7	6
Not consolidate because of land fragmentation	2.01	1.153	57.3	7
Non cooperation of water and soil deputy department	2.19	1.351	61.6	8

Table 4. Relation between farmers' intention to cooperate in land consolidation project implementation and independent variable.

First variable	Second variable	Correlation coefficient	r_s	P
Farmers cooperate in land consolidation implementation	Education level	Spearman's	0.524**	0.000
	Amount of knowledge of consolidation	Spearman's	0.429**	0.000
	Rate of ownership	Spearman's	0.276*	0.013
	Owners trust to each other	Spearman's	0.233	0.037
	Owners trust to government	Spearman's	0.387**	0.001
	Owners, membership in secondary groups	Spearman's	0.228*	0.024

*Significant at 5% level ($p < 0.05$) and **Significant at 1% level ($p < 0.01$).

Soil Deputy Department, and the fact that the lands are fragmented and apart (Table 3).

Hypothesis testing

Hypothesis 1

According to Table 4, the results indicate that there is a positive and significant relationship between the farmers' literacy level and their willingness to implement the land consolidation project at 1% level ($r_s = 0.524$). So the farmers with a higher education level are more willing to implement the land consolidation project. This could be due to the fact that improving literacy can broaden their viewpoints about the advantages of consolidation and increase their willingness to implement the consolidation project as a result.

Hypothesis 2

Results of Table 4 also demonstrate that there is a positive and significant relationship between the farmers' awareness rate and their cooperation in the land consolidation project at 1% level ($r_s = 0.429$). This shows that the farmers with more awareness and knowledge of land consolidation project are more willing to implement

the land consolidation project. The reason for this could be the fact that people who have studied the issue learn about its merits and demerits. This knowledge could make them more analytical and consequently more capable of opting for more suitable solutions for their problems.

Hypothesis 3

As shown in Table 4, there is a positive and significant relationship at 5% level ($r_s = 0.276$ and $p = 0.013$) between farmers' ownership rate and their cooperation in implementing land consolidation project. Farmers owning a bigger number of lands are more willing to cooperate in land consolidation project. This willingness could be justified as: 1) land consolidation causes the elimination of a lot of extra borders which are there as a result of land fragmentation. This could be interpreted as an increase of the size of land farms under cultivation; 2) consolidation causes the improvement in the use of production sources and mechanized tools and facilities. Also transferring mechanized tools from one farm to another would be eliminated.

Hypothesis 4

The results of the study of the relationship between the

Table 5. Relative contribution (partial and model R²) in predicting farmers' intention to cooperate, F-value and multiple correlation coefficients by the stepwise procedure analysis.

Variable entered	R coefficient	Partial R ²	Model R ²	F value
Amount of knowledge of land consolidation	0.605	0.356	0.356	124.78
Owners' trust in government	0.787	0.144	0.620	107.05
Rate of ownership	0.799	0.105	0.576	80.16
Owners' membership in secondary groups	0.813	0.094	0.661	179.18

landowners' trust in each other and their willingness to implement the land consolidation project shown in Table 4 indicate that there is a positive and significant relationship at 5% level ($r_s = 0.233$ and $p = 0.037$) between the two variables. Therefore, the farmers who trust each other more are more willing to implement the land consolidation project. Since group cultivation demands a sense of mutual cooperation, and respect for others' opinions, farmers who have more trust in each other are more willing to implement the land consolidation project.

Hypothesis 5

The results also indicates that that there is a positive and significant relationship at 1% level ($r_s = 0.387$ and $p = 0.001$) between the rate of land owners' trust in the government and their willingness in implementing the land consolidation project (Table 4). Farmers' trust in the government makes their cooperation in implementing the land consolidation more effective. As the consolidation project is introduced and carried out by the government, the farmers' trust in the government could pave the way and bring about more cooperation.

Hypothesis 6

The results also produces a positive and significant relationship at 5% level ($r_s = 0.228$ and $p = 0.024$) between the rate of land owners' membership in the secondary groups and their cooperation in implementing the land consolidation project. This means that the farmers with a longer membership and cooperation with the secondary groups are more willing to implement the land consolidation project. The justification could be the fact that membership in secondary groups could increase collective decision making. It would help the farmers consider land fragmentation as a group problem and find out that land consolidation is the way to solve the problem. Therefore, landowners' membership in the secondary groups would make them more willing to cooperate in the land consolidation program. According to the results of Table 5, based on the regressions analysis, the variables of farmers' knowledge of lands

consolidation, land ownership, farmers' trust in government and farmers' membership in social groups influence the farmers' willingness to implement the land consolidation project.

Stepwise multiple linear regressions

Here, it provides an empirical analysis between the dependent variable and some of the explanatory variables that were established in the previously. This procedure was used to determine the variable accounting for the majority of total farmers' willingness to cooperate in consolidation project implementation indicators. Multiple linear regressions in a stepwise manner were used and one variable was added to the regression equation at each step. The added variable was the one which induced the greatest reduction in the error sum of squares. It was also the variable which had the highest partial correlation with the dependent variable for fixed values of those variables already added. Moreover, it was the variable which had the highest F value. Table 5 shows the data representing partial and cumulative R² as well as the probability for the accepted limiting four explanatory variables in farmers' participation with executing the land consolidation project. These variables for the first dependent variable are: amount of knowledge of consolidation (35.6%), rate of ownership (14.4%), owners' trust in the government (10.5%) and owners' membership in secondary groups (9.4%).

According to the results, 69.9% of the total variation in farmers' willingness to cooperate in the consolidation project could be attributed to these aforementioned variables. F-value is high enough to reject the null hypotheses that the variables cannot explain the variations in farmers' willingness to cooperate between the households in the sample. The other variables were not included in the analysis due to their low relative contributions. Regression coefficients for the accepted variables are shown in Table 6.

Conclusion

According to the results of this study, some suggestions are offered to continue and accelerate the land

Table 6. Regression coefficient (B), t-value and probability (sig.) of the accepted variables that can be used to predict farmers' intention to cooperate by the stepwise procedure.

Variable entered	Coefficient of regression (B)	Beta	T/value	Sig.
Constant	0.329		2.365	0.019
Amount of knowledge of land consolidation	0.118	0.297	5.435	0.000
Rate of ownership	0.114	0.222	3.934	0.000
Owners' trust in the government	0.098	0.129	3.230	0.002
Owners' membership in secondary groups	0.079	0.119	3.772	0.000

consolidation program: firstly, owing to the significant relationship between farmers' cooperation in implementing the land consolidation project and the rate of farmers' awareness of land consolidation, it is suggested that farmers be informed enough of the advantages of land consolidation in different ways especially through mass media. They should also be encouraged to take part in educational classes accompanied by visits to successful projects carried out or being carried out. Secondly, as there is a significant relationship between the membership in secondary groups (rural communities), and landowners' willingness to cooperate in the consolidation project, it is suggested that the government encourage founding such communities, mediating groups and NGOs. Moreover, the results show that there is an interrelationship between the rate of farmers' ownership and their participation in land consolidation project. Hence, it is suggested that project implementation costs be calculated according to the farmers' rate of ownership. Small farmers should receive more fund than those who possess more lands and more fragmented farms. This would encourage small farmers to cooperate more willingly in land consolidation projects. Among the deterring factors in implementing the land consolidation project, the high costs of the project is considered to be the biggest obstacle from the viewpoint of farmers. Considering that land consolidation projects require investments and capitals to build canals, secondary roads between farms and other facilities, it is suggested that the government supply enough credit to the beneficiary farmers.

Finally, as farm qualities in contiguous villages and even different parts of a village are different, it is difficult to convince farmers to join the consolidation project. Initially, it would be better to use the temporary-exchange- of –lands method for farmers to learn about the advantages of land consolidation. Mutual exchange between farmers is usually done for some farming years, between farmers in the same village or neighboring villages and it is done as verbal agreements and informal contracts, and through elders' intermediation. Usually in this situation there would not be any exchange of fund

between farmers for mutual exchange of plots and after some farming years if farmers are satisfied, the temporary contract between them could change into a formal contract.

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