

Full Length Research Paper

Role of cooperative companies in sustainable rice production and poverty alleviation in Guilan state of Iran

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This study was conducted in the districts of Guilan state of Iran to assess the impact of cooperative companies on the economic condition of rice farmers in the Guilan state. The research was conducted in the 2005 to 2007 periods. Three hundred respondents were selected for the study comprising equal number of participants and non-participants of producer cooperatives. Data were collected using survey questionnaire with a reliability test of 88% using Kronback Alfa Coefficient. Data were analysed using descriptive and inferential statistics. The results showed that there were significant differences between members and non-members with respect to the production rate of paddy, income gained through sale of rice, level of participation, reduction of unemployment, increment of annual income and technical knowledge. Also, there was a positive correlation between the rate of paddy production per hectare with income resulting from the sale thereof, the income resulting from each hectare of the rice field with the annual income of the farmer, annual income of the farmer and rate of paddy produced and on participation in training courses and the production rate of paddy. According to above points, cooperative companies have a basic role in achievement sustainable rice production and reduction of poverty in Guilan state of Iran, thus cooperative companies should be organized and supported by government.

Key words: Cooperative companies, rural households, rice, income, employment.

INTRODUCTION

Almost half (46%) of the Iran population are living in rural areas and most of them are small farmers. Poverty, unemployment, wrong credit policies, lack of attention to education and training, neglect of agriculture and low investment are major constraints for development of rural areas of Iran (Tavakoli, 2005). Theorists believe that professional activities of rural people, if based on cooperation and cooperative works, may result in promotion of efficiency and improvement of their economic situation.

In Constitutional Law of the Islamic Republic of Iran, co-operative sector has been considered important and of a special standing just like private and public sectors. Undoubtedly, the economic benefits resulting from the characteristics of the cooperative system as well as high physical and mental values, that is, spirit of cooperation, collaboration and participation of the common public in their affairs can be known as among the reasons for emphasis of the constitutional law on cooperative companies.

At the second decade after the Islamic Revolution and in the recent years, the cooperative system of production has experienced a remarkable development and has been placed among the important policies of the Ministry of Agriculture such that in 2004 the number of such institutes reached 1019 cooperative companies and 49 provincial unions with more than 280 thousand members at 4879 villages (Unknown, 2006).

In new cooperative companies, independence and individual motives, enhancement of knowledge level of rural people and farmers and improvement of productivity, have been more concentrated. Therefore, because the cultivation has been integrated and the members are provided with the services of cooperative company, it has been further possible that any member can perform agricultural activities on his/her own piece of land and an adaptation has been established between the individual and collective interests. Thus, enhancement of the yield of product, facilitated obtainment of financial credits and

Table 1. Variance of subjects on the basis of production rate of rice paddy.

Production rate of paddy (kg)	Member			Non-member		
	Frequency	Percentage	Cumulative percentage	Frequency	Percentage	Cumulative percentage
Less than 3500	5	3.3	3.3	63	42	42
3501 - 4000	34	22.7	26	69	46	88
4001 - 4500	71	47.3	73.3	18	12	100
4501 - 5000	39	26	99.3	0	0	---
5001 and above	1	0.7	100	0	0	---
Total	150	100	---	150	100	---

provision of agricultural essentials, optimum use of agricultural machinery, improvement of technical and economic conditions have been possible.

Omani and associates (2002) reviewed the impact of membership in cooperative companies of production on the level of technical, economic and social characteristics of wheat farmers in Khuzestan. According to results, there is a meaningful difference between the level of technical knowledge of wheat farmers, level of mechanization, rate of wheat yield, rate of income, rate of social participation of members and non-members.

Tavasoli (2006) reviewed that, there is a meaningful positive relation between the dependent variable (economic, social and technical efficiency of cooperative companies of rural production) with independent variables (number of family members, number of company members, age, education, membership period, share amount, integrity of lands).

The general objective of the study the impact of cooperative companies of rural production on the improvement economic conditions of Guilan rice farmers, and their role in reduction of poverty and creation of sustainable employment.

RESEARCH METHODOLOGY

More than 65 percent rice production in Iran is produced in the Guilan state. The study was carried out of villages of Asatane, Langeroud and Fouman cities of the Guilan state of Iran during April 2005 to September 2007. The present paper is of a descriptive, causal-comparative and correlation type. Statistical universe of this paper covers the rice farmers who are the members of 10 cooperative companies of rural production: Rasht, Somae-sara, Fouman, Lahijan and Masal as well as rice farmers of the same or neighboring villages who are non-members of cooperative companies. The sample size is 300 comprising 150 rice farmers who are members of cooperative companies and 150 non-members. In measuring the role of cooperative companies in poverty reduction and sustainable food production, a comprehensive schedule was developed and field-tested before data collection. Personal interview, direct observation and group discussions were the methods used for data collection. The main tool for collection of data and information related to the variables of research was the questionnaire, with a reliability calculated at 88% using Kronback Alfa Coefficient. Statistical analysis was done with the help of SPSS 15.0 package. These involved descriptive statistics (frequency,

percentage and cumulative percentages) and inferential statistics (t test and correlation coefficient).

RESULTS AND DISCUSSION

Production rate of rice paddy

Descriptive results

Among 150 rice farmer members of the cooperative company, the paddy production rates have been as follows: 3.3% have had less than 3500 kg/hectare, 22.7% have had 3501 -4000 kg/hectare, 47.3% have had 4001-4500 kg/hectare, 26% have had 4501-5000 kg/hectare and 0.7% has had more than 5000 kg/hectare. Also among 150 non-member rice farmers, the paddy production rates have been as follows: 42% have had less than 3500 kg/hectare, 46% have had 3501-4000 kg/hectare and 12% have had 4001-4500 kg/hectare (Table 1).

Analytical results

First Hypothesis: Cooperative companies of rural production are effective in enhancement of rice paddy production.

Results achieved (Table 2) indicated that the calculated t (16.404) is greater than $t_{(1\%)}$. Therefore, with an accuracy of 99%, the zero hypothesis ($H_0: \mu_1 = \mu_2$) is rejected, and we conclude that there is a meaningful difference (statically) between compared averages. In other words, the cooperative companies of production have been successful in increment of paddy production rate of their members.

Level of participation

Descriptive results

Out of 150 rice farmer members of the cooperative company of production has been as follow; 3.33% high

Table 2. Analysis of the variance of average of rice paddy production rate.

Parameter	T	DF	SIG	Difference between averages	Average difference
Equal variance assumed	-16.404	298	0.000	6.68733	0.40766
Equal variance not assumed	-16.404	293.977	0.000	6.68733	0.40766

Table 3. Variance of subjects on the basis of level of participation.

Level of participation	Member			Non-member		
	Frequency	Percentage	Cumulative percentage	Frequency	Percentage	Cumulative percentage
High	5	3.33	3.33	4	2.67	2.67
medium	4	2.67	6	3	2	4.67
Low	3	2	8	3	2	6.67
	138	92	100	140	93.33	100
Total	150	100	---	150	100	---

Table 4. Analysis of the variance of average of participation of paddy production rate.

Parameter	T	DF	SIG	Difference between averages	Average difference
Equal variance assumed	20.67	298	0.00	143.16667	6.92618
Equal variance not assumed	20.67	273.159	0.00	143.16667	6.92618

level participation, 2.67% medium level participation 2% low level participation in their rice fields. Also Out of 150 non-member rice farmers, has been as follow; 26.7% high level participation, 2% medium level participation and 2% low level participation in their rice fields (Table 3).

Analytical results

Third Hypothesis: Cooperative companies of rural production are effective in participation of paddy production rate.

Results achieved (Table 4) indicated that the calculated t (20.67) is greater than $t_{(1\%)}$. Therefore, with an accuracy of 99%, the zero hypothesis ($H_0: \mu_1 = \mu_2$) is rejected and we conclude that there is a meaningful difference (statically) between compared averages. In other words, the co-operative companies of production have been successful in participation of paddy production rate of their members.

Increment of the income earned through rice cultivation

Descriptive results

Among 150 rice farmer members of the cooperative com-

pany, the rice cultivation incomes have been as follows: 1.3% between 801 to 900 dollars (\$)/hectare, 38.7% between 901 to 1000 dollars (\$)/hectare, 24.7% between 1001 to 1100 dollars (\$)/ hectare, 23.3% between 1101 to 1200 dollars (\$)/hectare, 12% more than 1200 dollars (\$)/hectare. Also among 150 non-member rice farmers, the rice cultivation incomes have been as follows: 18% less than 800 dollars (\$)/hectare, 18.7% between 801 to 900 dollars (\$)/hectare, 38% between 901 to 1000 dollars (\$)/hectare, 16% between 1001-1100 dollars (\$)/hectare, 5.3% between 1101 to 1200 dollars (\$)/hectare, and 4% more than 1200 dollars (\$)/hectare (Table 5).

Analytical results

Forth Hypothesis: Co-operative companies of rural production are effective in increment of the rice farmers' earning.

Results achieved (Table 6) indicated that the calculated t (30.833) is greater than $t_{(1\%)}$. Therefore, with an accuracy of 99%, the zero hypothesis ($H_0: \mu_1 = \mu_2$) is rejected, and we conclude that there is a meaningful difference (statically) between compared averages. In other words, the co-operative companies of production have been successful in increment of the rice farmers' earning.

Table 5. Variance of subjects on the basis of income per hectare of rice field.

Income amount (dollars.(\$) (thousand Toman)	Member			Non-member		
	Frequency	Percentage	Cumulative percentage	Frequency	Percentage	Cumulative percentage
Less than 800	0	0	0	27	18	18
801-900	2	1.3	1.3	28	18.7	36.7
901-1000	58	38.7	40	57	38	74.7
1001-1100	37	24.7	64.7	24	16	90.7
1101-1200	35	23.3	88	8	5.3	96
1201 and above	18	12	100	6	4	100
Total	150	100	---	150	150	---

Table 6. Analysis of the variance of average of earning per hectare of the rice fields.

Parameter	T	DF	SIG	Difference between averages	Average difference
Equal variance assumed	-30.833	298	0.000	555.65333	18.02132
Equal variance not assumed	-30.833	269.406	0.000	555.65333	18.02132

Implementation of national agricultural plans (integration of lands, plantation of oil seeds, etc.)

Descriptive results

Among 150 rice farmer members of the cooperative company, implementation of mentioned plans were as follows: 12.7% with plan for equipping and rehabilitating the lands, 36.7% with plan for biological prevention against rice stemborer, 3.3% with plan for ratoon cultivation, 2.7% with plan for second plantation in rice fields after rice harvest, 1.3% the plan for equipping and rehabilitating the lands and mechanized cultivation of rice, 37.3% with plan for equipping and rehabilitating the lands and the plan for biological prevention against rice stemborer, 1.3% with plan for rice production increment and 2% with plan for colza cultivation in farming lands. Also, among 150 non-member rice farmers, implementation of mentioned plans were as follows: 23.3% with plan for equipping and rehabilitating the lands, 17.3% with plan for biological prevention against rice stemborer, 2.7% with plan for ratoon cultivation, 2% the plan for second plantation in rice fields after rice harvest, 0.7% the plan for equipping and rehabilitating the lands and mechanized cultivation of rice, 17.3% with plan for equipping and rehabilitating the lands and the plan for biological prevention against rice stemborer, 2.7% with plan for rice production increment and 2% with plan for colza cultivation in farming lands (Table 7).

Analytical results

Seventh Hypothesis: Cooperative companies of rural pro-

duction are effective in implementation of national agricultural plans (integration of lands, plantation of oil seeds, etc.).

Results achieved (Table 8) indicated that the calculated t (5.835) is greater than $t_{(1\%)}$. Therefore, with an accuracy of 99%, the zero hypothesis ($H_0: \mu_1 = \mu_2$) is rejected and we conclude that there is a meaningful difference (statistically) between compared averages. In other words, the co-operative companies of production have been successful in development of national agricultural plans.

Technical knowledge of farmers

Descriptive results

Out of 150 rice farmer members of the cooperative company of production, 65.3 and 34.7% answered YES and NO, respectively, to the question about taking part in training courses. Out of 150 non-member rice farmers, 39.3 and 60.7% answered YES and NO, respectively, to the mentioned question (Table 9).

Analytical results

Eighth Hypothesis: Cooperative companies of rural production are effective in promotion of technical knowledge of farmers.

Results achieved (Table 10) indicated that the calculated t is greater than $t_{(1\%)}$. Therefore, with an accuracy of 99%, the zero hypothesis ($H_0: \mu_1 = \mu_2$) is rejected and we conclude that there is a meaningful difference (statistically) between compared averages. In other words, the

Table 7. Variance of subjects on the basis of essential plans implemented on their rice fields.

Implementation of plans	Member			Non-member		
	Frequency	Percentage	Cumulative percentage	Frequency	Percentage	Cumulative percentage
Equipping and rehabilitation of lands	19	12.7	12.7	35	23.3	23.3
Biological prevention against rice stemborer	55	36.7	49.4	26	17.3	40.6
Ratoon	5	3.3	52.7	4	2.7	43.3
Second plantation (cereals, vegetables and summer products)	4	2.7	55.4	3	2	45.3
Equipping and rehabilitation of lands and mechanized farming	2	1.3	56.7	1	0.7	46
Equipping and rehabilitation of lands and biological prevention	56	37.3	94	26	17.3	63.3
Rice production increment plan	2	1.3	94	4	2.7	64
Colza cultivation	3	2	96	3	2	66
No answer	4	2.7	100	48	32	100
Total	150	100	---	150	100	---

Table 8. Analysis of the variance of average of implementation of national agricultural plans in promotion of technical knowledge of their members.

Parameter	T	DF	SIG	Difference between averages	Average difference
Equal variance assumed	-5.835	298	0.000	-0.5000	0.08568
Equal variance not assumed	-5.835	296.543	0.000	-0.50000	0.08568

Table 9. Variance of subjects on the basis of taking part in training courses.

Have you taken part in training courses?	Member			Non-member		
	Frequency	Percentage	Cumulative percentage	Frequency	Percentage	Cumulative percentage
Yes	98	65.3	65.3	59	39.3	39.3
No	52	34.7	100	91	60.7	100
Total	150	100	---	150	100	---

co-operative companies of production have been successful.

dollars (\$)/hectare, 20.7% between 1501 to 2000 dollars (\$)/hectare and 12.6% more than 2000 dollars (\$)/hectare (Table 11).

Increment of annual income of rice farmers

Descriptive results

Among 150 rice farmer members of the cooperative company, the annual incomes (earned through rice cultivation, etc.) have been as follows: 29.3% between 1001 to 1500 dollars (\$)/hectare, 47.3% between 1501 to 2000 dollars (\$)/hectare, 23.4% more than 2000 dollars (\$)/hectare. Also among 150 non-member rice farmers, the annual incomes have been as follows: 22.7% less than 1000 dollars (\$)/hectare, 44% between 1001 to 1500

Analytical results

Ninth Hypothesis: Cooperative companies of rural production are effective in increment of annual earning of rice farmers.

Results achieved (Table 12) indicated that the calculated t (12.691) is greater than $t_{(1\%)}$. Therefore, with an accuracy of 99%, the zero hypothesis ($H_0: \mu_1 = \mu_2$) is rejected, and we conclude that there is a meaningful difference (statically) between compared averages. In other words, the co-operative companies of production

Table 10. Analysis of the variance of average of taking part in training courses.

Parameter	T	DF	SIG	Difference between averages	Average difference
Equal variance assumed	-4.309	298	0.000	-0.24000	0.05570
Equal variance not assumed	-4.309	296.579	0.000	-0.24000	0.05570

Table 11. Variance of subjects on the basis of annual income.

Total income (dollars.(\$) thousand Toman)	Member			Non-member		
	Frequency	Percentage	Cumulative percentage	Frequency	Percentage	Cumulative percentage
Less than 1000	0	0	0	34	22.7	22.7
1001 - 1500	44	29.3	29.3	66	44	62.7
1501 - 2000	71	47.3	76.6	31	20.7	83.4
2001 and above	35	23.4	100	19	12.6	100
Total	150	100	---	150	150	---

Table 12. Analysis of the variance of average of annual earning of rice farmers.

Parameter	T	DF	SIG	Difference between averages	Average difference
Equal variance assumed	-12.691	298	0.000	-883.49333	69.61487
Equal variance not assumed	-12.691	293.961	0.000	-883.49333	69.61487

Table 13. Variance of subjects on the basis of production of types of handicrafts.

Handicraft products	Member		
	Frequency	Percentage	Cumulative percentage
Yes	16	10.7	10.7
No	134	89.3	100
Total	150	100	---

have been successful in increment of annual earning of their members.

Development of handicrafts

Descriptive results

Out of 15 rice farmer members of the cooperative company and 150 none-member rice farmers, 10.7 and 6.7% participated in production of types of handicrafts, respectively (Table 13).

Analytical results

Tenth Hypothesis: Cooperative companies of rural production are effective in development of handicrafts.

Results achieved (Table 14) indicated that the calculated t (1.872) is greater than $t_{(1\%)}$. Therefore, with an accuracy of 99%, the zero hypothesis ($H_0: \mu_1 = \mu_2$) is rejected, and we conclude that there is a meaningful difference (statically) between compared averages. In other words, the cooperative companies of production have been successful in production and development of handicrafts among their members.

Reduction of unemployment period of rice farmers

Descriptive results

Among 150 rice farmer members of the cooperative company, the unemployment period was as follows: 2% with 1 - 2 months, 4.7% with 3 - 4 months, 54.7% with 5 - 6 months, 13.3% with more than 7 months. 25.3% stated

Table 14. Analysis of the variance of average of handicraft activities.

Parameter	T	DF	SIG	Difference between averages	Average difference
Equal variance assumed	1.872	298	0.51	0.12428	0.5725
Equal variance not assumed	1.872	288.129	0.51	0.12428	0.5725

Table 15. Variance of subjects on the basis of unemployment period during the year.

Unemployment period (month)	Member			Non-member		
	Frequency	Percentage	Cumulative percentage	Frequency	Percentage	Cumulative percentage
1 - 2	3	2	2	0	0	0
3 - 4	7	4.7	6.7	8	3.5	5.3
5 - 6	82	54.7	61.4	48	32	37.3
7 and above	20	13.3	74.7	53	35.3	72.6
No unemployment	38	25.3	100	41	27.6	100
Total	150	100	---	150	100	---

Table 16. Analysis of the variance of average of reduction of unemployment period of farmers.

Parameter	T	DF	SIG	Difference between averages	Average difference
Equal variance assumed	3.857	298	0.000	0.14000	0.3630
Equal variance not assumed	3.857	229.418	0.000	0.14000	0.3630

that they are not workless throughout the year. Among 150 none-member rice farmers, the unemployment period was as follows with 5.3% with 3 - 4 months, 32% with 5 - 6 months, 35% with more than 7 months. 27.4% stated that they are not workless throughout the year (Table 15).

Analytical results

Eleventh Hypothesis: Cooperative companies of rural production are effective in reduction of unemployment period of farmers.

Results achieved (Table 16) indicated that the calculated t (3.857) is greater than $t_{(1\%)}$. Therefore, with an accuracy of 99%, the zero hypothesis ($H_0: \mu_1 = \mu_2$) is rejected confirmed and we conclude that there is meaningful difference (statically) between compared averages. In other words, the unemployment period is the same among the member and non-member individuals.

Correlation coefficient

The results reached from correlation coefficient indicated that there is the highest correlation between the rate of paddy production per hectare with income earned

through selling it (0.843), income earned from each hectare of rice field with the annual income of farmer (0.601), annual income of farmer and the paddy produced (0.515), presence at training courses with production rate of paddy (0.358). Also there is a reverse correlation between the production cost of paddy with the income earned from each hectare (-0.716), production cost of rice and the rate of paddy produced per hectare (-0.491) and production cost of rice per hectare and annual income (-0.387).

Conclusion

The achieved results indicated that Cooperative companies of production of Guilan state as the economic, social and production units, are effective in enhancement of production of rice paddy, optimum use of the rice field, increment of the earning of rice farmers, implementation of national agricultural plans (integration of lands, planting the oil seeds, etc.), level of participation rate of rice farmers, increment of annual income, establishment and development of handicrafts, and reduction of seasonal unemployment of rice growers.

Cooperative companies of production are considered as the fundamental and main centers for encouraging the people to participation and socialism and also as the

point of realization of culture of participation in the economic and social activities and can lead to sustainable rice production and reduction of poverty in Guilan state of Iran. Thus cooperative companies should be organized and supported by government.

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