



Effective Factors on the Participation of Mazandaran Province Rural Women in Rice Cultivation

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Abstract

The purpose of this study was to identify factors which affect rural women's participation in rice cultivation (RW-PRC) in Mazandaran Province, Iran. The population of this research consisted of all rural women in Mazandaran Province, Iran. By using a multi-stage random sampling, 300 rural women were selected as statistical sample. The research instrument was a structured questionnaire including some closed-ended questions whose validity and reliability were confirmed by a panel of expert and through a Cranach's alpha test ($\alpha=0.86$), respectively. The descriptive results indicated that RWPRC was close to a moderate level. Furthermore, it was shown that the main reasons for rural women's participating in rice cultivation were helping family economy, obtaining extra income, and gaining production surplus, in the order of importance. In addition, these results illustrated the highest RWPRCs were in selecting seed, transplanting and preparing pre-germinated seedling storage, respectively. Moreover, the findings showed significant relationships between RWPRC and some of its individual and professional characteristics. Finally, the results of the multivariate regression analysis revealed that 42.9 % of variability in RWPRC stems from household income, family size, and land size under rice cultivation. Finally, it is recommended for extension organizations to give attention to the role of gender in agriculture for better extension planning.

Keywords:
*agricultural production,
farm participation, rural
economy, rural women*

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INTRODUCTION

Empirical evidences suggest that women in rural areas are more adversely affected by poverty than men. Although women play an indispensable role in farming and in improving the quality of life in rural areas, their contributions often remain concealed due to some social barriers and gender bias (Singh et al., 2015). During the last twenty years, the vital roles of rural women in development-related indicators such as providing food security, environmental sustainability, eradication of poverty, and population control were clarified for the international community (Sha'ban-Ali Fami, 2009). Based on Mossie and Yousuf's study (2015), rural women often manage complex households and pursue multiple livelihood strategies. Their activities typically include producing agricultural crops, tending animals, processing and preparing food, working for wages in agricultural or other rural enterprises, collecting fuel and water, engaging in trade and marketing, caring for family members and maintaining their homes. Many of these activities are not defined as "economically active employment" in national accounts but they are essential to the well-being of rural households. According to the FAO's report (1995), they are involved in supplying food to more than 50 percent of the world's population. Women form, on average, 43 percent of the agricultural labor force in developing countries ranging from 20 percent in America to 50 percent in East and Southeast Asia (FAO, 2011). Ahmed and Hussain (2004) stated that rural women had a vital role in production of the main agricultural crops in Asia. Results of their research indicated that rural women's share of the main agricultural crops ranged from 30 percent in rice production to, 25 percent in cotton production, 23 percent in sugarcane production, 18 percent in wheat production and 26 percent in vegetable production. According to World Bank (2009), rural women in Southeast Asian countries are responsible for more than 90 percent of rice cultivation. Vanclay (2004) believe that role of rural women in agricultural production is increasing for reasons such as the changing structure of agriculture sector, demand

for non-farm income, and the diversity of farming activities. Narmatha et al. (2009) state, that despite rural women's key roles in agriculture and related activities, these roles are clearly not been reviewed. Luqman et al. (2006) also state that these activities and roles are mistakenly perceived as to be poor and are undocumented. So, United Nations Population Fund (2010) reported about the situation of rural women that attempts to identify and evaluate their roles in agriculture are one of the main requirements of rural development. According to Chizari et al. (1997), the examination of the situation of rural women leads to decisions about allocation of resources and the identification of their educational and technological needs which, ultimately, results in the development of better guidelines for the preparation and implementation of training programs for them. Sha'ban-Ali Fami (2006) also states that the identification of factors affecting rural women's participation in agricultural activities help develop guidance for both researchers and extension agents to meet their educational needs.

Several studies have attempted to identify effective factors on the rural women's participation in agricultural production. These studies have indicated that that rural women's participation in agricultural activities is influenced by such variables age (Boozar-Jomhoori et al., 2010; Chayal et al., 2010; Damisa & Yohanna, 2007; Mossie & Yousuf, 2015; Sha'ban-Ali Fami, 2006; Tologbonse et al., 2013), educational level (Boozar-Jomhoori et al., 2010; Chizari et al., 1997; Damisa & Yohanna, 2007; Mir-Torabi et al., 2012; Mossie & Yousuf, 2015; Sha'ban-Ali Fami, 2006; Singh et al., 2015; Tologbonse et al., 2013), family income (Chayal et al., 2010; Chizari et al., 1997; Mir-Torabi et al., 2012; Mossie & Yousuf, 2015; Singh et al., 2015), family farm size (Boozar-Jomhoori et al., 2010; Chizari et al., 1997; Suman, 2008), household size (Ghanbari et al., 2012; Mir-Torabi et al., 2012), marital status (Mir-Torabi et al., 2012; Sha'ban-Ali Fami, 2006; Tologbonse et al., 2013), farming experience (Sha'ban-Ali Fami, 2006; Singh et al., 2015), the amount of extension contacts (Mossie & Yousuf, 2015;

Singh et al., 2015; Tologbonse et al., 2013), the amount of access to market (Tologbonse et al., 2013), the use amount of information resources (Mir-Torabi et al., 2012), and land holding (Damisa & Yohanna, 2007).

As a consequence of ignoring the rural women's contribution to economic activities of family, their activity value is overlooked in national accounting (Sha'ban-Ali Fami, 2009). Because women constitute half of society, it is impossible to achieve sustainable development without their participation. Hence policy-makers in agricultural sector need to give a special attention to rural women's role in agricultural development in order to achieve economic development and increase agricultural productivity and production (Ghanbari et al., 2012). In Iran, like other countries, rural women participate in agricultural activities, especially rice and tea cultivation according to the local social and cultural situation, so that some reports indicated that 76 percent of activities related to rice cultivation in the Lahijan township, Gilan Province were carried out by rural women (Habibi & Zandieh, 2011). Given the farmers' share of Mazandaran Province farmers in Iran's rice production (47 percent), these questions arise; to what extent do rural women participate in the rice cultivation, and which factors do affect it? Since we did not find, the answer to these questions in the literature review, this study was conducted to answer these questions.

Given these research questions, the main purpose of this study was to identify effective factors on the participation of Mazandaran Province's rural women in rice cultivation. The specific objectives of this study were:

- to describe professional and individual characteristics of the respondents;
- to assess the extent of respondents' participation in rice cultivation;
- to identify the reasons for respondents' participation in rice cultivation;
- to compare RWPRC with respect to their ownership status of land under rice cultivation;
- to examine the correlation between RWPRC and their professional and individual characteristics; and

- to determine how much variance RWPRC could be captured by independent variables.

MATERIALS AND METHODS

The population of the study consisted of all rural women of Mazandaran Province, Iran. The population was sampled on the basis of Zamani et al's (2009) multi-stage technique. Five towns of Mazandaran Province out of 13 were randomly selected. Next, two counties from each town, three villages from each county, 10 people from each village were selected by simple random sampling, overall, 300 rural women were studied (n=300).

This research assessed the extent of respondents' participation in rice cultivation through a questionnaire as the research instrument. The dependent variable was investigated through seven questions. Interviewees were asked to choose on option from the 5-point Likert scale (1: not at all to 5: very high). The validity of the research instrument was verified by a panel of experts. A pilot test was conveyed to estimate the reliability of the research instrument. Based on the results of Cronbach's alpha test, the average reliability of questionnaire was 0.86 which shows an appropriate internal consistency.

The statistical method in the present study was descriptive statistics (mean, standard deviation, minimum, maximum, frequency, and frequency percentage) and Kruskal Wallis test, Spearman coefficient correlation, and multivariate regression analysis were used to analyze and summarize the data. Data were analyzed in SPSS version 16.

RESULTS AND DISCUSSION

Objective 1: To describe respondents' professional and individual characteristics

The average age of the respondents was 41 years with the standard deviation of 9. The majority of them (115 or 38.30%) were in the age group of 36-47 years. The respondents' experience in rice cultivation was, on average, 19 years with the standard deviation of 12. The majority of them (149 or 49.70%) were in the farming experience group of 21-30 years. The respondents' land under rice cultivation varied from 0.2 to 4

hectares while almost three quarters of them (219 or %73) devoted less than one hectare of agriculture land to rice production. The distance from the respondents' residence village to nearest city varied from 4 Km to 30 Km. The distance from residence village of the majority of the respondents (240 or 80%) to nearest city was 22 - 30 Km. The majority of them stated their level of education was secondary school (85 or 21.97%) and primary school (67 or 20.70%). Finally, majority of them (248 or 82.70%) stated that their husbands were the owners of the land under rice cultivation while only 5% stated both themselves and their husbands were the owners of land under rice cultivation (Table 1).

Objective 2: To assess the extent of respondents' participation in rice cultivation

Rural women were asked to indicate their participation in rice cultivation. Means and standard deviations are reported in Table 2. As

Table 2 shows, generally, rural women stated that their participation in rice cultivation was at a nearly moderate level (M= 3.04, SD= 0.72). This result is consistent with Chizari et al. (1997) and Suman (2008). Furthermore, the other results indicated that the respondents were mostly engaged in "seed selection" regarding rice cultivation. The two next important activities were "transplanting" and "Preparing pre-germinated seedling storage".

Objective 3: To identify the reasons of respondents' participation in rice cultivation

Rural women were asked to indicate their reasons to participate in rice cultivation for seven items. It should be noted that the respondents could choose one, two, or all the items. Frequency and percent of frequency for the seven items are reported in Table 3. As shown in Table 3, the main reasons of rural women to participate in rice cultivation were "helping

Table 1
Professional and Respondents' Individual Characteristics (n=300)

Variable	Group	Frequency	Percentage	Mean	SD
Age (years)	24-35	105	35.0	40.65	9.45
	36-47	115	38.30		
	48-59	80	26.70		
Experiences in rice cultivation (years)	1-10	113	37.70	19.34	11.58
	11-20	38	12.70		
	21-30	149	49.70		
Land under rice cultivation (ha)	Less than 1	219	73.0	1.06	0.85
	1-2	50	16.70		
	More than 2	31	10.30		
Distance from residence village to nearest city (Km)	4-12	29	9.70	22.66	5.57
	13-21	31	10.30		
	22-30	240	80.0		

Table 2
The Amount of Respondents' Participation in Rice Cultivation (n=300)

Items	Mean*	SD	Rank
Seed selection	4.33	0.50	1
Transplanting	4.13	0.59	2
Preparing pre-germinated seedling storage	4.02	1.05	3
Maintenance of pre-germinated seedling storage	3.93	0.51	4
Nutrition management	3.36	0.56	5
Land preparation	2.69	0.86	6
Storage-related activities	2.25	0.78	7
Harvesting	2.18	0.71	8
Processing activities	2.13	0.93	9
Marketing activities	1.60	0.74	10
Total	3.04	0.72	-

Table 3
The Reasons for Respondents' Participation in Rice Cultivation (n=300)

Items	Mean*	Percent	Rank
Helping family economy	293	97.70	1
Obtaining extra income	286	95.30	2
Production surplus	286	95.30	3
Inadequate labor	271	90.30	4
Personal interest	268	89.30	5
A feeling of responsibility	246	82.00	6
Status of husband job	224	74.70	7

Table 4
Comparison of RWPRC with Respect To Their Ownership Status of Land under Rice Cultivation (n=300)

Variable	Variable levels	Frequency	Rank mean	test	p-value
ownership status of land under rice cultivation	Only family man	248	165.44	$\chi^2= 144.67$	0.000
	Only rural woman	7	134.08		
	Together	15	90		
	Rental land	30	34		

family economy" (97.70%), "obtaining extra income" (95.30%), and "production surplus" (95.30%), respectively. These results indicated that economic reasons were the main reasons of respondents to participate in rice cultivation.

Objective 4: To compare RWPRC with respect to their ownership status of land under rice cultivation

A Kruskal-Wallis test was conducted to examine the differences among the amount of RWPRC regarding their ownership status of land under rice cultivation. As Table 4 shows, there were statistically significant differences among RWPRC in terms of their ownership status of land under rice cultivation. In the other words, the

extent of rural women's participation in the farms owned by the husband was more than in rental farms.

Objective 5: To examine the correlation between RWPRC and their professional and individual characteristics

Spearman coefficient was employed for the measurement of the relationships between RWPRC and their professional and individual characteristics. As Table 5 shows, there was statistically significant positive relationship between RWPRC and their professional and individual characteristics including age ($r_s=0.259$, $p<0.01$), experience in rice cultivation ($r_s=0.155$, $p<0.05$), and the amount of using information resources

Table 5
Correlation between RWPRC and Their Professional and Individual Characteristics (n=300)

Variable	RWPRC	
	r_s	p-value
Age	0.259**	0.000
Level of education	-0.181**	0.002
Experience of land cultivation	0.155*	0.031
Land size under rice cultivation	-0.278*	0.043
Family size	-0.217**	0.002
Distance between residence village and nearest town	0.091	0.121
Household income	-0.314**	0.000
The use amount of information resources	0.227**	0.000

Note: * $p<0.05$ ** $p<0.01$

Table 6
Multiple Linear Regression (RWPRC as Dependent Variable)

Variable	Unstandardized coefficients	standardized coefficients	t	p-value	VIF	Tolerance
	B	Beta				
Constant	23.949	-	8.466	0.000	-	-
Household income (X1)	-2.522	-0.325	-6.467	0.000	1.89	0.695
Family size (X2)	-0.665	-0.315	-9.095	0.000	1.67	0.897
Land size under rice cultivation (X3)	-0.576	-0.185	-5.427	0.002	4.72	0.246

R=0.655, R²=0.429, F=111.684, p-value=0.000

($r_s=0.227$, $p<0.01$). These results are in agreement with Chayal et al., 2010; Damisa & Yohanna, 2007; Mir-Torabi et al., 2012; Sha'ban-Ali Fami, 2006; Singh et al., 2015.

The results in Table 4 shows statistically significant negative relationship between RWPRC and their professional and individual characteristics including level of education ($r_s=-0.181$, $p<0.01$), land size under cultivation ($r_s=-0.278$, $p<0.01$), family size ($r_s=-0.217$, $p<0.01$), and household income ($r_s=-0.314$, $p<0.01$). These results confirm some other research results (Boozar-Jomhoori et al., 2010; Chayal et al., 2010; Chizari et al., 1997; Damisa & Yohanna, 2007; Ghanbari et al., 2012; Mir-Torabi et al., 2012; Mossie & Yousuf, 2015; Sha'ban-Ali Fami, 2006; Singh et al., 2015; Tologbonse et al., 2013).

Objective 6: To determine how much variance RWPRC could be captured by independent variables

Multiple linear regression analysis was used to investigate cause-and-effect relationship between the dependent and independent variables. The stepwise linear regression analysis was conducted to investigate the factors affecting RWPRC. In addition, the variance inflation factor (VIF) quantifies the severity of multi-collinearity in this regression analysis. A rule of thumb is that if $VIF > 10$ then multi-collinearity is high. Accordingly, based on VIF values, there were no problems regarding multi-collinearity in this research.

According to table 6, household income, family size, and land size under rice cultivation affects the participation of rural women in rice cultiva-

tion. Adjusted R² shows that independent variables explain about 42.9% of changes in dependent variable.

The results also showed that the regression equation was significant at the one percent level ($F=111.684$, $p<0.01$). Significant regression equation derived from this analysis is as follows:

$$Y=23.949-2.522X_1-0.665X_2-0.576X_3$$

CONCLUSION

Iranian rural women's participation in economic activities, particularly agriculture, is an undeniable reality. Results of this research showed that RWPRC was at a nearly moderate level. On the other hand, rural women participated in 50% activities related to rice cultivation. It was also revealed that the majority of rural women's activities in rice cultivation were related to seed selection, transplanting, and preparing pre-germinated seedling storage. This result also showed that rural women were the least active ones in rice marketing activities. In general, the results showed that the extent of rural women's participation in rice cultivation decreases from pre-plant stage to harvest stage. It seems pre-plant and harvest activities are related to male farmers and rural women, respectively. These results indicated both rural women and male farmers equally contribute to growing rice.

This type of participation also leads to lower production costs and higher household income. Results of this research showed that the main reason for Mazandaran Province's rural women's participation in rice cultivation was to improve household economic status. Finally, this research indicated that Mazandaran Province's rural

women were most active in rice cultivation in family farms owned by their husbands. Of course, this type of participation may be rooted in the culture of the region.

The results of multiple linear regression analysis also indicated that RWPRC in Mazandaran Province was influenced by several factors: 42.9% of the variance in RWPRC was accounted for by household income, number of family members, and land size under rice cultivation. On the other hand, rural women's lower household income, smaller family size, and smaller land size under rice cultivation increases their participation in rice cultivation.

Based on these results, it is recommended for extension organizations to consider gender roles in extension planning, in general, and to provide rural women who are more engaged with extension service, at the beginning stage of extension planning, in particular. These women can be identified by lower household income, smaller family, and smaller agricultural land. Finally, it is recommended to develop a database of the rural women's roles and functions in rice cultivation for better planning and more thorough training programs.

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