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Constraints Facing Rice Farmers in Iraq

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Bassim Haleem Kshash[1] and Hayat Kadhum Oda[2]

[1]Al-Qasim Green University, Agriculture College , Babylon, Iraq.
[2]Al-Qasim Green University, College of Food Science , Babylon, Iraq.
[1]E-mail: bassim@agre.uoqasim.edu.iq

Abstract. There is a decrease in cultivated area and production of rice in Iraq. This study was conducted in Mahanawiyah District, Diwaniyah Province, Iraq, to identify constraints facing rice farmers. One hundred and thirty rice farmers were randomly selected. A list of 3 categories affecting rice cultivation: production, financial and institutional, covering 25 constraints was prepared and administered to the respondents.50% of rice farmers indicated there was a high level of constraint facing them. Water shortage, low price during harvested, laborious nature of rice cultivation, weeding problems, poor extension service, scarcity of trained labor, high cost of inputs(fertilizer, pesticides), reluctance of rural youth to involve in rice cultivation, high cost of irrigation, high cost of improved varieties, instability of government policies for rice production, low productivity, unfavorable government marketing system, and high cost of land preparation, were the most cited. There were a negative significant relationships between respondents age, educational level and years of experience in rice cultivation with overall constraint score. Constraints were differed in their effect depending on rice farmer's characteristics'.

Keywords. Obstacles, Paddy growers, Production, Summer crop.

1. Introduction

Rice (*Oryzae sativa*) is the most important summer crop in Iraq [1]. The area for rice cultivation in 2018 was 5425 ha, producing 18200t of paddy with a low average yield 3.35 Mt. ha. For the period of 2014-2018, there is a decreasing in cultivated area (from79300 to 5425 ha) and production (from 403000 to 18200 t) [2]. Rice production and productivity needs to be increased. Increasing rice production and productivity requires identifying and solving problems which can impede rice cultivation.

Constraints facing rice farmers are extensive and have been enumerated by [3- 24]. In Iraq little has been done to determine constraints faced by rice farmers in Mahanawiyah District. Determination of these constraints could be useful in enhancing productivity. The study was undertaken to determine constraints facing rice farmers and evaluate relationship between constraints and socioeconomic characteristics of rice farmers so as to determine the differences in constraints effect based on socioeconomic characteristics.

2. Material and Methods

The study was carried out in Mahanawiyah District in Diwaniyah Province, located in south central Iraq between 31.17° and 32.24° N latitude and 44.24° and 45.49° E longitude. Diwaniyah Province located in the Middle of Euphrates provinces and a major rice producing area [2]. The population for this study consisted of 443 rice farmers of Mahanawiyah district, 10 were chosen for testing the

questionnaire reliability, from the 433 remaining, 130 were randomly selected to provide responses to the questionnaire from 1-20 June 2019.

The instrument used was a 2part questionnaire, namely socio-economic characteristics and constraints. The socio-economic characteristics include age, education level, area cultivated with rice, years of experience in rice cultivation, and annual revenue from rice cultivation. The constraint part listed out likely 25 problems faced by farmers during rice cultivation and grouped them into three categories: production(11),financial (7), and institutional (7).

Content validity of the questionnaire was established by a panel of experts in the field of agricultural extension and rice cultivation. A pilot study was conducted to establish reliability of the instrument, a Cronbach's alpha (a reliability coefficient) of 0.93 was established, indicating the instrument used was reliable and valid.

Constraints measured on a four point continuum scale as high (H) (3), medium (M) (2), low (L) (1) and not effect (N) (0) constraint.In relation to their level of vulnerability, in all-over constraints,each respondent will give scores ranged from(0 to75), respondents were categorized in to 3groups low(0-24),medium(25-49) and high effect(50-75).Each constraint was given a score ranging from (1to3),the three categories and 25 constraints were categorized regarding on weighted arithmetic mean(WM)of their effect into:low(0-0.9),medium(1-1.9), and high (2-3).The index values of observations were represented by the mean score figure.

Data were analyzed using frequency, percentage, mean, standard deviation(SD),weighted arithmetic mean(WM) [WM = (no. of H×3)+(no. of M×2)+(no. of L×1)+(no. of N×0)/ total respondents],simple person correlation and Chi test, by using SPSS version 22. Constraints facing rice farmers were analyzed separately, weighted mean score were calculated, the relative importance ranked in descending order.

3. Results

50% of respondents faced high constraints in rice cultivation, followed by medium (40%) and low constraints (10%) (Table1). Mean constraints effect for overall rice farmers is within the medium category.

Among constraint categories, financial constraints were ranked first followed by production and institutional constraints(Table2). The overall index of financial constraints was high, those of production and institutional were medium.

Table 1. Distribution of respondents according to constraint effect (N=130).

Constraint effect	F	%	Mean	SD
Low (0–24)	13	10	17.2	4.35
Medium(25–49)	52	40	33.5	8.47
High(50–75)	65	50	58.3	11.7
Overall	130	100	47.25	16.8

For financial category , most of respondents felt high constraints, followed by medium and low constraints(Table 2)., the highly effected constraints were water shortage ,laborious nature of rice cultivation, weeding problems, scarcity of trained labor and low productivity(Table 3). More than third of respondents faced high production constraints, followed by medium and low constraints (Table 2)., water shortage ,laborious nature of rice cultivation , weeding problems, scarcity of trained labor and low productivity, were the highly effected production constraints (Table 3).For institutional constraints forty percent of respondents faced high constraint followed by low and medium constraint(Table2), poor extension service, reluctance of rural youth to involve in rice cultivation, instability of government policies for rice production and unfavorable government marketing system, were the highly effected institutional constraints (Table 3).

Relationships between socio-economic descriptors of respondents and constraints varied (Table 4), there were negative significant relationships between the overall constraint score and respondents age, educational level and years of experience in rice cultivation, while annual revenue from rice had positive significant relationships with constraints.

Chi-test had shown differences between constraints effect depending on socio-economic of rice farmers (Table 5).

Table 2. Weighted mean and effect level of constraints categories.

Categories	Effect level								Weighted mean
	High		Medium		Low		No effect		
	F	%	F	%	F	%	F	%	
Production	45	34.6	40	30.8	26	20.0	19	14.6	1.84 (medium)
Financial	60	46.2	38	29.2	22	16.9	10	7.7	2.14 (high)
Institutional	40	30.8	33	25.4	35	26.9	22	16.9	1.70 (medium)

Table 3. Weighted mean and level effect for constraints of rice farmers.

Category	Constraint	Weighted mean
Production	Water shortage	3.0(High)
	Laborious nature of rice cultivation	2.9(High)
	Weeding problems	2.8(High)
	Scarcity of trained labor	2.6(High)
	Low productivity	2.2(High)
	Pest and diseases problems	1.8(Medium)
	Low soil fertility	1.3(Medium)
	Pesticides ineffectiveness	1.2(Medium)
	Small size of land holding	1.0(Medium)
	Unavailability of improved varieties	0.8(Low)
	Lake of capital	0.7(Low)
Financial	Low price during harvested	3.0(High)
	High cost of inputs(fertilizer, pesticides)	2.6(High)
	High cost of improved varieties	2.4(High)
	High cost of irrigation	2.4(High)
	High cost of land preparation	2.0(High)
	High cost of harvest	1.4(Medium)
	High wages of labor	1.2(Medium)
Institutional	Poor extension service	2.7(High)
	Reluctance of rural youth to involve in rice cultivation	2.5(High)
	Instability of government policies for rice production	2.3(High)
	unfavorable government marketing system	2.1(High)
	Poor marketing information	1.1(Medium)
	Poor farmer organization	0.6(Low)
	Lake of storage facilities	0.6(Low)

Table 4.Correlation between socioeconomic characteristics and constraints.

Characteristic	Correlation coefficient(r)
Age	-0.347*
Education level	- 0.328*
Area cultivated with rice	0.119
Years of experience in rice cultivation	– 0.415*
Annual income from rice	0.562*

*P≤0.05.

Table 5. Distribution of respondents according to characteristics and constraint effect.

Characteristic and description		Category constraint effect								Chi square
		Low		Medium		High		Total		
		F	%	F	%	F	%	F	%	
Age (years)	18 – 30	0	0	9	7.0	30	23.1	39	30.1	22.1*
	31 – 43	6	4.6	25	19.2	25	19.2	56	43.0	
	44– 56	7	5.4	18	13.8	10	7.7	35	26.9	
	total	13	10	52	40	65	50	130	100	
Educational level	< Secondary	0	0	4	3.1	18	13.8	22	16.9	26*
	Secondary	3	2.3	18	13.8	34	26.2	55	42.3	
	University	10	7.7	30	23.1	13	10.0	53	40.8	
	Total	13	10	52	40	65	50	130	100	
Area cultivated with rice (ha)	1– 3	4	3.1	15	11.5	20	15.4	39	30.0	0.14 N.S
	4 – 6	6	4.6	24	18.5	30	23.1	60	46.2	
	7 – 9	3	2.3	13	10.0	15	11.5	31	23.8	
	Total	13	10	52	40	65	50	130	100	
Experience in rice cultivation (years)	5 – 15	1	0.8	14	10.8	25	19.2	40	30.8	10.6*
	16 – 26	5	3.8	27	20.8	30	23.1	62	47.7	
	27 – 37	7	5.4	11	8.4	10	7.7	28	21.5	
	Total	13	10	52	40	65	50	130	100	
Annual revenue from rice ($)	< 10000	0	0	8	6.2	5	3.8	13	10.0	12.2*
	10000 – 20000	4	3.1	31	23.8	43	33.1	78	60.0	
	> 20000	9	6.9	13	10.0	17	13.1	39	30.0	
	total	13	10	52	40	65	50	130	100	

N.S,* not significant or significant at 0.05 level of chi square.

4. Discussions

The half of rice farmers in study area faced high constraints. Any constraint facing rice farmers will have adverse effects on production.

For production constraints ; water shortage ranked first (Table 3).Water is the single most important component of sustainable rice production, especially in the traditional rice growing areas of Asia [25]. Traditional method of rice cultivation in Iraq requires a continuous submergence of fields throughout rice cycle, which requires large quantities of water, after seed germination, farmers keep their fields flooded and submerged, with continuously water drainage until a few weeks before the crop reaches maturity [26]. In general Iraq is usually plagued with water scarcity and became more severe during the summer rice cultivation[27,28].

Laborious nature of rice cultivation ranked second among rice production constraints as all farm operations were done manually except tillage, leveling and harvesting. After land leveling, the field is flooded, farmers inverting the mud by hand or with a shovel and trampling the soil with their feet, seeds are broadcast by hand directly in flooded field, this is a very laborious and tedious.

During various rice cultivation operations agriculture workers undergo high physical strain and fatigue. In overall rice cultivation process, manual rice transplanting operation is one of the drudgery prone and back- breaking activity [29].

Weed problems ranked third among rice production constraints as weed affects rice cultivation by competing for nutrient, light, water and space, it serve as host for pests , and carriers for diseases [30-32].

Weeds infestation is estimated to cause about 37% losses in rice yield [30], increase production costs [31], reduce yield quality and price [32].

Scarcity of trained labour ranked fourth among rice production constraints as manual rice farming requires more skilled labors for rice cultivation. The non-availability of skilled labor at the planting season delays rice transplanting and ultimately results in poor yield [33].

Low productivity ranked fifth as constraint to rice production. Some recent studies clearly indicated a decline in rice productivity in Iraq [34,35]. Low productivity will cause low income owing to decrease in production output thereby leading to higher production cost per unit. The low productivity of rice can be attributed to the low use and inadequate availability of high yielding varieties, poor management practices, water shortage and low application of fertilizers as pointed out by rice farmers in this study and this confirmed the finding of [36].

As regards financial constraints, low price during harvest time ranked first. Most rice farmers sell their products at low price during the time of harvest [37]. Low rice prices causes decrease in returns. In Iraq, the government purchase rice from farmers, Price is paid according to specifications. Rice farmers felt that local and governmental price are too low compare to production costs.

In traditional farming, small farmers use more inputs to earn higher rice yield [38] especially fertilizers and pesticides. Some studies indicated that higher usage of these inputs increased fertilizer and pesticide costs[39,40].High cost of inputs(fertilizer, pesticides) is the second financial constraints facing rice farmers,the findings are similar to [41,42].

Rice farmers use of improved varieties leads to increasing productivity [43] and farm output[44]. The high cost of improved varieties ranked three among financial constrains facing rice farmers, [5] pointed to the same constraint.

Appropriate land preparation is essential process for successful rice cultivation, it involves: first plowing, first harrowing, second plowing, second harrowing and land leveling. Land preparation was the most expensive activity in rice cultivation [45]. The respondents put high cost of land preparation at fourth, Agricultural extension services play a significantly role in increasing rice yield [46,47]. Rice farmers considered poor extension service as the first among institutional constraints, the findings are similar to [48].

Rural youth is the potential agricultural labor force, they can contribute to expand agricultural production through new practices they own. But majority of them not interested and appear reluctant to involve in agricultural activities [49-51]. Rice farmers considered reluctance of rural youth to involve in rice cultivation as the second institutional constraints, the findings are similar to [52].

Stabile agricultural policy is a key factor in sustainability of agricultural production. In Iraq there is instability of agricultural policy related to rice in recent years, particularly with regard to the supply of production inputs and the government prices to purchase rice from farmers. This instability ranked third among institutional constraints, [5] pointed to this constraints.

The agricultural policy related to rice in Iraq compels farmer to market the paddy to the Ministry of Commerce. In the receiving centers, samples are taken from paddy for examination and measuring yield specification, which in turn determines yield degree and its appropriate price. These centers are not ready to deal with large numbers of marketers and large production quantities during a specified period. Rice farmers feel there is unfavorable government marketing system and ranked it fourth among institutional constraints.

Coefficient of correlation computed in order to explore the relationships between overall constraints score of each of the respondents and selected characteristics of rice farmers. The negative significant relationships between constraint and age, educational level and years of experience in rice cultivation implies the higher age, education and experience of respondent had negative impact on constraints.

Increased in respondent's age, educational level, and years of experience decreased effects of constraints. Education enhances farmer's knowledge, and by increasing educational level, there is improved access to production information. Knowledge is often positively influenced by years of experience.

Constraints faced by rice farmers is reduce by increasing rice income. In traditional agriculture , increasing agricultural income often linked to the improvement of production quality and quantity , which is accessible through access to modern agricultural information and application, improved production inputs and marketing methods, which implies higher efficiency by rice farmers.

Chi-test shown a differences between constraints effect depending on age, education level, area cultivated with rice, years of experience in rice cultivation, and annual revenue from rice (Table 5).The highest percentage of respondents with high constraints effect were among the second category of annual revenue, while the highest percentage of respondents at least constraints effect within third category of education level.

Conclusions and Recommendations

Based on findings of present study, it can be concluded that age of (73.1%) of rice farmers ranged between(18-43) years, 83% had secondary and above educational level,30% of them cultivate less than four hectare, about 70% of them have more than sixteen years of experience. Half of rice farmers faced high constraints .Financial category had the high effect. The high perceived constraints were: water shortage, low price at harvested, laborious nature of rice cultivation, weeding problems, and poor extension service. Negative significant relationships between respondents age, educational level and years of experience in rice cultivation with overall constraint score. There were differences between constraints effect depending on rice farmers characteristics.

In the light of these findings, the following recommendations are thereby suggested for the improvement of rice productivity:

- Addressing challenges faced by rice farmers through activation extension services.
- More similar studies should conducted in other provinces to know challenges facing rice farmers.

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