

Factors Constraining Small Scale Rice Production in Jowhar District, Hirshabelle State, Somalia

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Abstract: The study surveyed the factors constraining rice production in Jowhar district, Hirshabelle state, Somalia. These problems can be grouped into Agronomic and Socioeconomic factors. Rice production in study area is well known in comparison to other parts of southern Somalia. The study was carried through descriptive survey research design. A study sample of 80 farmers was selected from four rice farming villages in the district. Questionnaire was designed to gather information from the farmers. The data was analyzed with the help of SPSS software using frequency, percentage and means. The study have shown that 70.0% of the respondents were male, about 46.3% of the respondents fall the age between 20-25 years, about 67.5% of the respondents were farmers with 65% of them having farm size between 0.5-3 hectares. The agronomic factors constraining rice production in the study area include lack of proper and high yielding cultivars 47.5%, Pests and Diseases 68.8%, and drought impacts 57.5%. The socioeconomic factors influencing rice production include financial constraints 73.8%, lack of research and extension services 46.3%, and illiteracy 43.8%. It is suggested that farmers should be assisted with modern rice farming technologies coupled with research and extension services.

Keywords: Agronomic factors; constraints; Socio-economic factors and Rice production

Date of Submission: 23-03-2020

Date of Acceptance: 10-04-2020

I. Introduction

Rice, *Oryza sativa* (Asian rice) or *Oryza glaberrima* (African rice), is the most commonly consumed staple food for a large part of the world's human population. It is the agricultural commodity with the third-highest worldwide production of 741.5 million tonnes in 2014 (FAO, 2014). Rice is highly important grain with regard to human nutrition and caloric intake (Smith, 1998). A large number of the world's population or more than a billion household throughout Asia, Africa and America rely on rice systems for their main sources of income. It is also on the forefront in the struggle against world hunger and poverty (Nguyen and Ferrero, 2006). The formation of the International Rice Commission under the supports of the UN and other international organizations was in recognition of the significance of the crop toward increasing world food production.

Rice farming was introduced in to Somalia between 1960 and 1970. But its extension to the farmers in Jowhar district started after 1980. Rice is a staple food for many Somalis and constitutes a major part of the diet. It is a major contributor to internal trade. In Somalia, rice is produced in irrigated ecosystem as compared to other sub-Saharan Africa where five main ecosystems, namely rainfed uplands, rainfed lowlands, inland swamps, irrigated ecosystem and mangrove swamps are used for its production (Norman and Otoo, 2003). The average paddy production and grain yield obtained by smallholder farmers in Somalia and as many other sub-Saharan farmers (1.87 tonnes/ha) is well below the world average (3.84 tonnes/ha) (Zanet *et al.*, 1985). The low grain yield is due to several factors, including the low standard of production technologies used.

Somalia's inability to produce rice to self-sufficiency is suggestive of the presence of major constraints in the rice production requiring urgent attention. Rice farming in the country requires a good agricultural practices and technologies while the government should take an appropriate action to tackle the rice constraints. These challenges are agronomic and socioeconomic problems which hinder the development of rice production in Somalia. The agronomic factors constraining rice production in the study area includes lack of improved seeds, use of fertilizers, adequate pesticides for plant pest and disease management, lack of appropriate implements and post-harvest technologies. The main socioeconomic factors limiting rice production include lack of extension services, rice research and development and inappropriate market (Tran, 1997). Most of these constraints can be overcome with agricultural education which facilitate learning and instills a favorable attitude towards the use of improved farm practices (Nkamleu and Manyong 2005).

II. Materials And Methods

The study was carried out in Jowhar district, Hirshabelle state, Somalia. Jowhar is the capital city of Hirshabelle state of Somalia. The city lies 90 km (50 mi) along a major road north of the national capital of Mogadishu with coordinates of 2°47'N 45°30'E. The study area was selected based on the fact that it's the only place with long history of rice production in Somalia. The research was conducted through descriptive survey research design. The estimated target population was 100 people who came from the farmers in the district. From the target population of 100 people, the researchers selected 80 respondents as the sample size using Slovine's formula.

$$\text{Slovene's formula: } n = \frac{N}{1 + N(e)^2}$$

Where,

n= is the required sample size,

N= is the target population size, and

e= is the standard error or level of significance, which is popularly known to be 0.05 or 5%.

$$\text{For this study, } N = 100 \text{ and so the sample size was calculated as follows; } n = \frac{100}{1 + 100(0.05)^2}$$

$$n = \frac{100}{1.25} = 80$$

The sampling procedure of this study was non probability especially purposive sampling. It was selected based on the shared constraints of the farmers and the study objectives. The researchers also selected this sampling technique because it gave the opportunity to choose the relevant respondents who can provide the accurate information or data. The primary data of this study was collected through questionnaire. The independent variables used in this study were socioeconomic factors and agronomic factors that limited the rice production in the study area. The factors were measured on a four point Likert scale type of very severe, moderately severe, severe and not severe respectively. Descriptive statistic such as frequency counts, means and percentage were used in analyzing the data with the help of SPSS software (Version 22).

III. Results And Discussion

Table 1. Demographic characteristics of the respondents

Variables	Frequency	Percentage
Gender		
Male	56	70.0
Female	24	30.0
Mean	1.26	
Age (Years)		
20-25	37	46.3
26-35	18	22.5
36-45	6	7.5
45-above	19	23.8
Mean	2.11	
Marital Status		
Single	25	31.3
Married	55	68.8
Mean	1.69	
Level of Education		
Primary education	53	66.3
Secondary education	25	31.3
Tertiary education	2	2.5
Mean	1.36	
Main Occupation		
Farmer	54	67.5
Teacher	4	5.0
Business man	4	5.0
Student	18	22.5
Mean	1.83	
Farm size (ha)		
0.5-3 ha	52	65.0
3-5 ha	17	21.3
5-7 ha	4	5.0
7-10 ha	7	8.8
Mean	1.56	
Years of rice farming experience		

1-5 years	24	30.0
5-10 years	8	10.0
10-20 years	15	18.8
20-30 years	33	41.3
Mean	2.75	

Source: Authors' results

Table 1 indicates the socio-economic characteristics of the rice producers in Jowhar district Hirshabelle state, Somalia. The table shows that 70.0% of the respondents were male, while 30.0% of them were female. It also displays that 46.3% of the respondents fall the age between 20-25 years. It also reveals that 31.3% of the respondents were single while 68.8% of them were married. The table further demonstrates that 66.3% of the respondents have primary education. It also illustrates that 67.5% of the respondents were farmers with 65% them having farm size between 0.5-3 hectares. Finally, the table shows that 30% of respondents have farming experience of less than 5 years with mean farming experience of 2.75.

Table 2. Agronomic factors constraining rice production

Factors	Very severe	Moderately severe	Severe	Not severe	Total
1. Lack of proper and high yielding cultivars					
Frequency	38	7	25	10	80
Percentage	47.5	8.8	31.3	12.5	100.0
2. Pests and Diseases					
Frequency	55	4	18	3	80
Percentage	68.8	5.0	22.5	3.8	100.0
3. Water deficit					
Frequency	46	14	15	5	80
Percentage	57.5%	17.5%	18.8%	6.3%	100.0
4. Soil fertility constraints					
Frequency	42	14	23	1	80
Percentage	52.5	17.5	28.8	1.3	100.0
5. Poor farm mechanization					
Frequency	22	15	34	9	80
Percentage	27.5%	18.8%	42.5%	11.3%	100.0

Source: Authors' results

Table 2 shows the agronomic factors constraining rice production in the study area. Almost 48% of the rice farmers in the area stated that lack of proper and high yielding cultivars is very severe problem to their rice production while 8.8% stated it is moderately severe. The respondents that stated lack of proper and high yielding cultivars are severe and not severe problem percent 31.3 and 12.5 respectively. Absence of suitable varieties has been existing as one of the major constraints to further development of the domestic rice production in Somalia. A large proportion of rice farmers still depend on the traditional varieties, which are of low yield and not adapted to the various altitudes.

The table also indicates that 68% of respondents claimed that pests and diseases are very severe problem to rice production, 5% claimed it is moderately severe, 22.5% claimed it is severe while 3.8% claimed it isn't severe. Numerous insect pests damage rice crop including Rice Water Weevil, Rice Stink Bug, Fall Armyworm, Chinch bug, Mexican rice borer, sugarcane borer, grasshoppers, Blister Beetles and Leafhoppers. This is only the half problem because many pathogens also cause severe damages as blast, Rice yellow mottle virus and Bacterial blight (Heinrichs and Muniappan, 2017).

The table further shows that 57.5% of the respondents said that water deficit impacted the rice production area very severely while 17.5% of the respondents said the water deficit impact is moderately severe; 18.8% said that problem is severe, and the remaining 6.3% said it isn't severe. The disengagement of the Government from most agricultural activities have led to a poor management and utilization of water resources and deterioration of these facilities by farmers. An important aspect for rice production in the study area will be the rehabilitation of abandoned irrigated systems which provide the best conditions for rice cultivation as they offer better water control. While the area occupied by rainfed and upland rice is the largest in most African countries, the irrigated ecosystem account for the main part of rice production in Somalia.

Additionally, the table establishes that 52.5% of the respondents agreed soil fertility constraints are very severe to rice farming in the district, 17.5% agreed that it is moderately severe, and 28.8% agreed it is severe while 1.3% of the respondents agreed it is not severe.

Finally, 27.5% of the respondents revealed poor farm mechanization is very severe, while 18.8% revealed it is moderately severe; 42.5% revealed that the constraint is severe, and the remaining 11.3% stated it is not severe. One of the critical factors that affect rice production in Somalia is the traditional methods used in agricultural production. Small farmers are unable to afford technologies such as tractors, power tillers and

animal traction. Large percent of the agricultural population in Somalia use handheld hoes and axes. These methods are labour intensive, and make the work very time and energy consuming.

Table 3. Socio-economic factors constraining rice production

Factors	Very Severe	Moderately Severe	Severe	Not Severe	Total
1. Financial constraints					
Frequency	59	11	9	1	80
Percentage	73.8	13.8	11.3	1.3	100.0
2. Produce marketing problems					
Frequency	43	7	20	10	80
Percentage	53.8	8.8	25.0	12.5%	100.0
3. Poor access to inputs					
Frequency	29	8	19	24	80
Percentage	36.3	10.0	23.8	30.0	100.0
4. Poor transportation					
Frequency	26	9	40	5	80
Percentage	32.5	11.3	50.0	6.3	100.0
5. Lack of research and extension services					
Frequency	37	11	14	18	80
Percentage	46.3	13.8	17.5	22.5	100.0

Source: Authors' results

Table 3 shows the socioeconomic factors limiting rice production in the study area. The table indicates that 73.8% of respondents claimed that financial constraints is major severe problem to rice farmers in Jowhar, 13.8% claimed it is moderately severe, 11.3% claimed it severe while 1.3% claimed it isn't severe. Farmers in Jowhar district and Somalia in general cannot buy tractors, agrochemicals, and other modern technology because of lack of funds and credits. Most of them do not have access to credit.

It also shows that 53.8% of the respondents stated produce marketing problems is very severe, 8.8% stated it is moderately severe, 25% claimed it is severe and the remaining 12.5% claimed it is not severe. Rice producers surveyed during a study attributed the current problems facing rice production and marketing to a total lack of Government policy in the sector (FAO, 2006). Research in other contexts also revealed that disorganization of market chain poses a fundamental constrain to rice productivity expansion (Norman and Otoo, 2003).

Moreover, the table demonstrates that 36.3% of the respondents said poor access to inputs is very severe, 10.0% said it is moderately severe while 23.8% said it is severe and the remaining 30.0% said it is not severe. The limited access of farmers to initial agricultural inputs acts as a barrier and hampers their ability to improve and expand their rice productivity, and generate higher incomes. Most of the farmers in Jowhar district never use chemical products. Fertilizers, herbicides and pesticides are found only in urban locations which farmers have to visit to make purchases. The country does not have the capacity to manufacture its requirement of chemical inputs and imported products, once cheap, are now sold at high prices to growers (Wichelns, 2003).

Table also reveals that the respondents stated poor transportation is 32.5% severe, 11.3% stated it is moderately severe, 50% stated the problem is severe while 6.3% stated it isn't severe. There is a relation between production and marketing of farm produce. Somalis' low standards of living are characteristically related with poor transport facilities (Rwabahungu, 2001). It is certain that transportation (roads, vehicles) can be the key factor in the success or failure of the entire development effort to the agricultural sector.

Lack of research and extension services was claimed to be 46.3% very severe while 13.8% claimed it to be moderately severe. 17.5% of the farmers claimed that lack of research and extension service is severe while 22.5% claimed it isn't severe. The government of Somalia didn't create any agency with a strong emphasis on rice in order to promote agricultural research, training and extension. This situation is resulting in the absence of research and development and extension services.

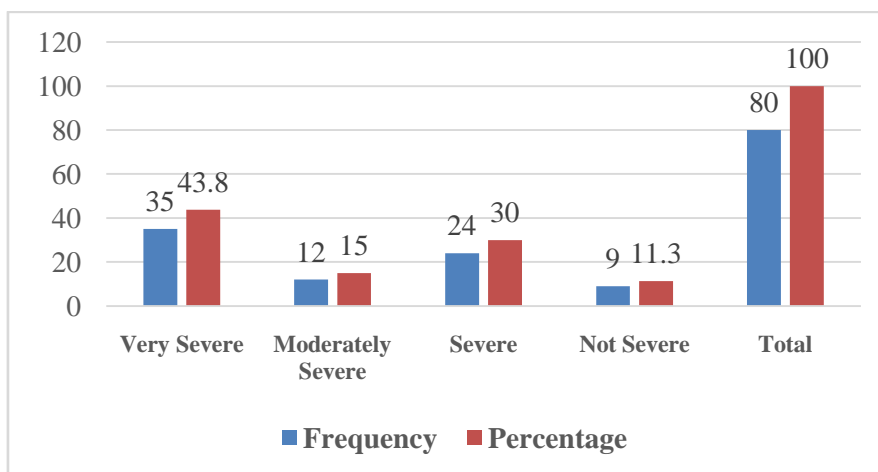


Figure 1. Illiteracy

Figure 1 demonstrates the illiteracy among the rice farmers in the study area. Illiteracy among the farmers seems to be high as 43.8% of respondents specified it to be very severe, 30% said it is severe, 15% said it is moderately severe while 11.3% said it isn't severe.

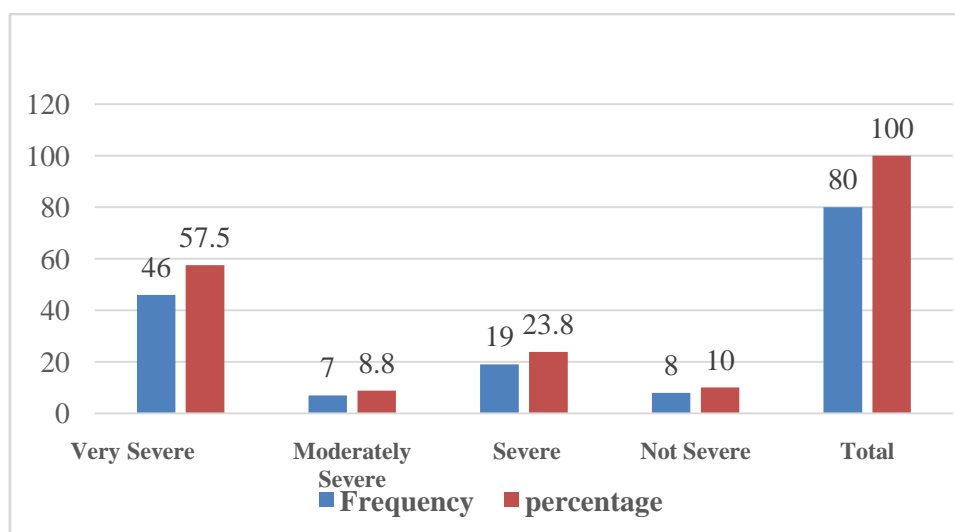


Figure 2. Lack of rice processing machine

The Figure displays the lack of rice processing machine in the study area. Lack of rice processing machine was identified as very severe by 57.5% of the respondents while 23.8% stated it is severe problem. 8.8% of respondents pointed out that the problem is moderately severe while 10% claimed it isn't severe. At the post-harvest level, rice processing is constrained by inadequate and inappropriate equipments such as threshing, parboiling, drying facilities, winnowing, milling, and de-stoning, especially at the farm and village level. The inability to provide and use improved technologies in rice processing has led to the production of poor rice quality. Hand-threshing for example is responsible for the high percentage of stones and foreign matter mixed with the rice This result is in line with findings of Matanmiet *al* (2011) who obtained that lack of rice processing machine was very severe(59.2%) among the rice farmers.

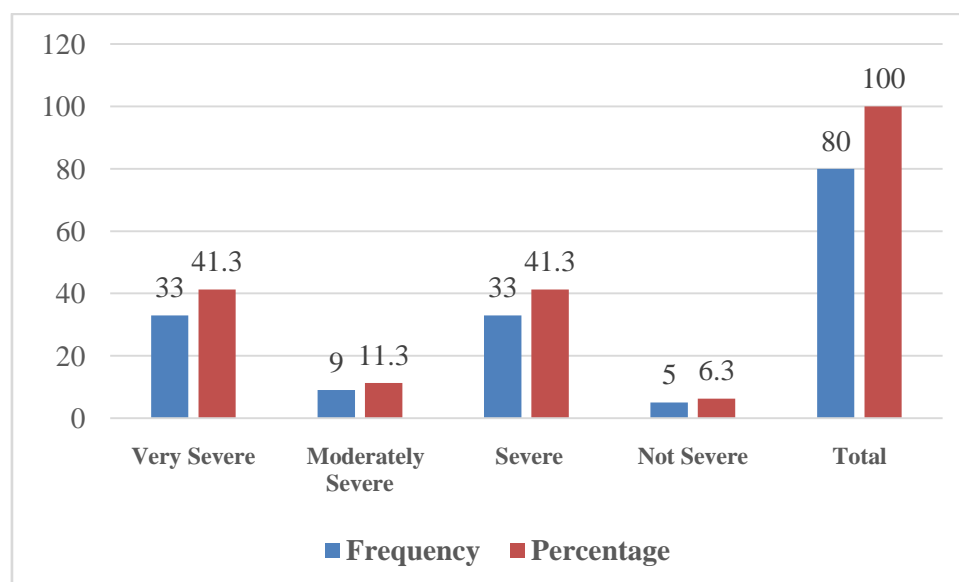


Figure 3. Lack of storage facilities

Figure 3 shows the lack of storage facilities in the study location. The figure demonstrates that 41% stated lack of storage facilities is very severe problem, another 41% stated it is severe, 11% stated it is moderately severe while 6% stated it isn't severe.

IV. Conclusions

The study investigated the factors constraining small scale rice production in Jowhar district, Hirshabelle sate, Somalia. From the findings of this study, agronomic factors like lack of proper rice cultivars, and socioeconomic factors like financial constraints proved to be a major problem factors influencing small scale rice production in the study area. These problem factors vary from very severe to not severe. According to Longtau (2003), agronomic constraints like seed, diseases, pests, climate, water regime, and weeds were identified to be constraint to rice production in Nigeria. Longtau (2003) also highlighted many of socioeconomic constraints of rice like policy consistency and instability; Fluctuation in value of local currency. The results of this study is little different from that of Longtau (2003) in that severity of the problems were evaluated. Anyhow these finds are well similar to that of Matanmiet *al* (2011).

V. Recommendations

Based on the outcomes of this study, the researchers suggest:

- The ministry of Agriculture, especially the extension section should provide training for small scale rice farmers to improve their knowledge and skills
- The government should create institutional help for the farmers to get seeds with good quality and appropriate pesticides.
- The government should improve structural irrigation channels and infrastructure to increase rice production in the country.
- Non- governmental organizations should participate in the improvement of small scale rice production in Somalia.
- Further research should be carried out by the concerning organizations in order to improve the overall production of rice in the country.

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Shuaib Abdullahi Siad, et al. "Factors Constraining Small Scale Rice Production in Jowhar District, Hirshabelle State, Somalia." *IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS)*, 13(4), 2020, pp. 14-20.