Agricultural Research & Technology
Open Access Journal
ISSN: 2471-6774

Juniper Publishers
key to the Researchers

Research Article
Volume 19 Issue 3 - January 2019
DOI: 10.19080/ARTOAJ.2019.19.556094

Agri Res & Tech: Open Access J

Wheat Baseline Study 2012/2013 Characterization of Wheat Producing Households in Sudan

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Submission: December 21, 2018, **Published:** January 11, 2019

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Abstract

The Support to Agricultural Research for Development on Strategic Commodities (SARD-SC) Project in Africa was launched to enhance food and nutrition security, poverty alleviation, improve productivity and increase income in target crops value chains on a sustainable basis. Wheat is an important food security crop in the Sudan and demand for wheat has increased rapidly in recent years while production falls short to meet the rising demand leading to increased importation of wheat from international market. The overall objective of the study is to document baseline information about the key variables upon which the Project seeks to make impacts among households in the targeted intervention areas. Primary data was collected through baseline survey, which was conducted in the major wheat producing areas in the Sudan, in four States. A total sample of 951 farmers' households was randomly selected and surveyed in the whole country using structured questionnaire. Data was analyzed using mainly descriptive statistics. Results of the survey showed that average wheat area grown by farmers was about 2.01ha for all Sudan. Overall respondents, Condor accounted for the highest share of the varieties grown by sampled farmers in season 2012/2013, followed by Imam, whereas only about 13% of the farmers surveyed across Sudan indicated that they grew Baladi (local) types of wheat. The average wheat yield across all Sudan was found to be about 1.98tons/ha. Nevertheless, it exhibited high variations across production locations ranging from 1.19 - 2.93tons/ha. Gross margin of wheat was positive across all locations but relatively low. The study recommended increasing productivity of wheat through development of enabling policy environment that include provision of formal credit and strengthening research and advisory services and technology transfer activities.

Keywords: Wheat; Characterization; Baseline survey; Sudan

Abbreviations: SARD-SC: Support to Agricultural Research for Development on Strategic Crops in Africa; CGIAR: Consultative Group on International Agricultural Research; AfDB: African Development Bank; ICARDA: International Center for Agricultural Research in the Dry Areas

Introduction

The Support to Agricultural Research for Development on Strategic Crops in Africa (SARD-SC) is a multinational Consultative Group on International Agricultural Research (CGIAR) - project of the African Development Bank (AfDB) [1]. The Project was launched to enhance food and nutrition security, poverty alleviation, improve productivity and increase income in target crops value chains on a sustainable basis. The International Center for Agricultural Research in the Dry Areas (ICARDA) is the executing agency for the wheat component. Wheat is an important food security crop in the Sudan and demand for wheat has increased rapidly in recent years while production falls short to meet the rising demand leading to increased importation of wheat from international market.

About 85% of the wheat area in Sudan is found in the central irrigated plains (14 - 16°N). The soils are mostly black clay Vertisols. The crop is adequately irrigated and fertilized. Relative humidity is generally low during the growing season. The crop is sown during November and harvested during March.

Wheat has emerged as an important calorie source in the Sudanese diet especially in urban areas. The Sudan wheat situation is characterized by rapid growth in consumption, continuous and variable deficit between domestic need and local production. In that respect the Sudan national efforts in increasing wheat production has been a priority.

The overall objective of the baseline survey is to document baseline information about the key variables upon which the Project seeks to make impacts among households in the targeted intervention areas. These expected key impact areas are: food security, household income, seed procurement and usage,

knowledge and practices of agriculture, access to technical information and extension services, access to credit and farm support. The specific objectives of the baseline survey are as follows:

a. To provide information on the initial situation ("snap shot") of the above-mentioned key project impact variables in the Project pilot sites. The information should provide insights into questions such as the following:

Who are the folks we are targeting in the Project?

What does the situation look like in the village presently (at this point of departure or "baseline")?

b. To help monitor some key project variables as the implementation of the Project progresses over time.

c. To create a dataset upon which future evaluations and assessments of the changes regarding key variables in the Project areas may be measured. e.g. what has changed with respect to a given key variable in the intervention area? (say in X years from now)?

In what way(s) has the variable changed?

To what extent has it changed?

Methodology

Both primary and secondary data were collected to achieve the objective of this study

Primary data was collected from the four main producing states (Northern and River Nile States, Gezira Scheme (Gezira State), and New Halfa Agricultural Scheme (Kassala State)) through intensive households' survey using a predesigned questionnaire and also meetings with key informants. Six regional sites were selected as the intervention sites, where innovation platforms were established.

The questionnaire was administered to a random sample of households' farmers and the data collected pertains to the agricultural season 2012-2013. A total sample of 951 farmers' households was selected and surveyed in the whole country. Data was analyzed using descriptive statistics such as means and frequencies [2].

Secondary data was collected from relevant sources, publications from Ministry of Agriculture, and different annual reports from Bank of Sudan and Food and Agriculture Organization statistic website. As well as reviewing of some of the documents, publications and reports related to the topic. A set of data from 1970 to 2012 was collected mainly about areas harvested, yield, production, consumption and imports for wheat.

Results and Discussion

Wheat grown area in season 2012-2013

Analysis of the survey data showed that the average wheat area was about 2.02ha for all Sudan, with the highest area recorded in Gezira (3.93ha), followed by New Halfa Scheme (2.31ha) and relatively small in Northern (1.73ha) and the River Nile State (1.41) as displayed in Figure 1 [1].

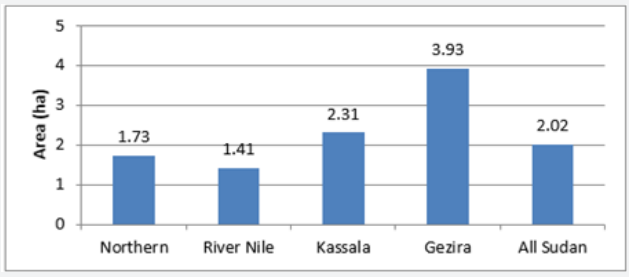

Figure 1: Average wheat grown area (ha) in Sudan, 2012-2013.
Source: Baseline survey [1].

Wheat varieties grown in 2012/2013

Overall Sudan, Condor accounted for the highest share of the varieties grown by sampled farmers in season 2012/2013, exclusively in Kassala (76%) and the River Nile States (45%), followed by Imam (22%), which was widely cultivated by sampled farmers in the Gezira (73%). Only about 13% of the farmers surveyed across Sudan indicated that they grew Baladi (local) types of wheat in season 2012/2013, with the highest percentage of growing Baladi types reported by farmers in the Northern State (51%) as shown in Figure 2.

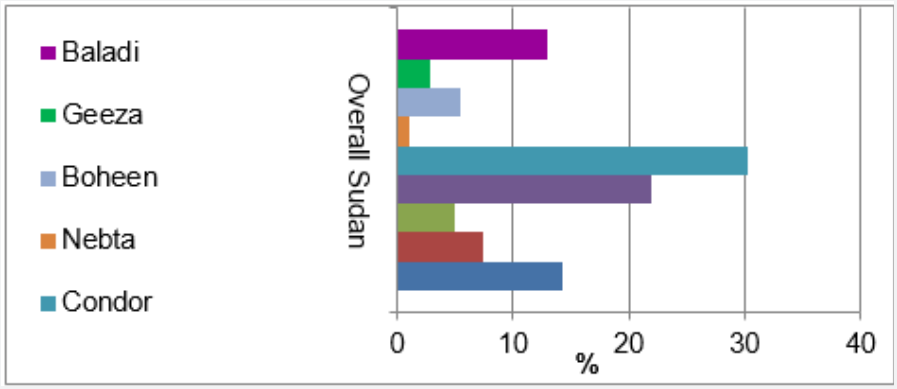

Figure 2: Varieties grown in season 2012/2013.

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Sources of credit

The sources of credit varied, but the main source of credit was formal from the Agricultural Bank of Sudan (37.2%). Overall Sudan, the scheme management supplied about 26% of credit to the farmers, with remarkable high percentage of farmers (78%) in Kassala State received credit from project management. About one quarter (23%) of farmers depended on informal sources of credit represented by traders and agents (Figure 3) [3].

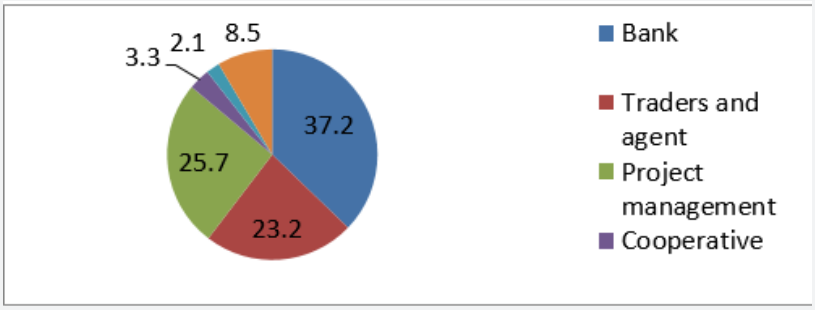

Figure 3: Sources of credit for wheat production (all Sudan).
Source: Baseline Survey [1]

Wheat yield

Analysis of survey data indicated that average wheat yield across all Sudan was found to be about 1.98tons/ha. Nevertheless, it exhibited high variations across production locations. Wheat yield was highest in the River Nile State (2.93tons/ha), followed by Northern State (2.31tons/ha), Gezira Scheme (2.12tons/ha) and lowest in New Halfa Scheme (1.19tons/ha) as displayed in Figure 4.

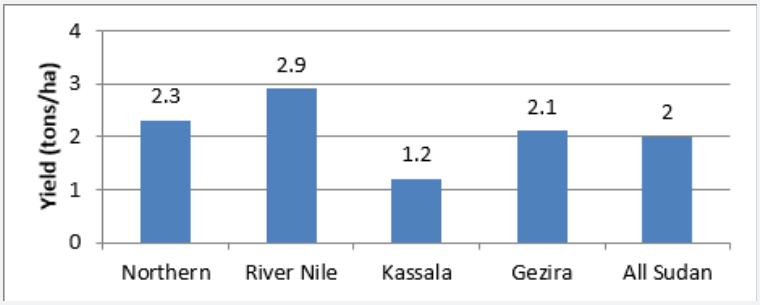

Figure 4: Average wheat yield.
Source: Baseline Survey [1]

Gross margin

Table 1: Total variable cost of production and gross margin of wheat (USD$/ha).

State	Northern	River Nile	Kassala	Gezira	All
Total Cost (USD$)	760.3	888.7	483.5	543.1	737.7
Yield (Sack/ha)	23.1	29.3	11.9	21.2	19.8
Price (USD$/sack)	40.1	44.6	41.4	41.3	42.6
Total return	925.1	1305.8	492.5	875.2	841.5
Net return	164.7	417	9	332.1	103.9

SDG denotes Sudanese Pound; 1$=5.69 SDG in 2012; 1 sack approximately 100kg

Wheat profitability represents an important incentive for farmers to grow it especially as cash crop. Gross margin of wheat was positive across all Sudan but relatively low (Table 1). It was highest in the River Nile State (417 USD$/ha), followed by Gezira Scheme (332 USD$/ha) and Northern State (165 USD$/ha) and it was very low in New Halfa Scheme (9 USD$/ha), apparently because of the low crop yield in that season [3].

Production problems

Sampled farmers indicated that, high production costs of wheat, was the major problem facing wheat producers in Sudan. Overall Sudan high cost of inputs was reported by about 47% of farmers (Table 2), while in Northern State higher percentage of farmers (74%) reported this problem, apparently because of the high costs of water pump operation. High costs of irrigation

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(14%), credit (10%), pests, diseases and weeds (9%), and water problems (8%) were also highlighted by farmers as problems facing production of wheat.

Key indicators

Benefit from growing improved wheat varieties compared to the past: Farmers were asked about the benefits from growing improved wheat compared to the past when traditional varieties were grown. In general, all farmers reported positive increase in their livelihoods conditions (Table 2). More than half the farmers indicated benefits and improvements in a variety of items of their livelihood conditions, including availability of wheat for food at home (thus improvement in their food security) and acquiring more assets.

Table 2: Benefit from Growing Improved Wheat Varieties Compared to the Past.

Benefit from Growing Improved Wheat Varieties Compared to the Past	Change (1 = Decrease 2=No Change 3= Increased)	Level of Change Compared to the Past When Growing Local Varieties (Percent Change)				Overall (%)
		Northern (%)	River Nile (%)	Kassala (%)	Gezira (%)	
Availability of Wheat for Food at Home	3	-	54.4	47.2	65.8	55.8
Availability of Other Food Items	3	-	34.1	50	68.4	50.3
Cash Income from Selling Wheat	3	-	78.5	41.7	68.4	62.9
Children's Education	3	-	74.6	48.6	70.9	64.7
Health for the Family	3	-	59.1	47.6	63.3	56.7
Livestock Husbandry	3	-	65.9	28.9	54.4	47.3
Clothing and shoes for Family	3	-	86.8	46.2	62	65
Communication (Phone, Tv, Etc)	3	-	79.6	86.1	93.7	86.5
Transport (Bicycle, Horse, Mule, Etc)	3	-	65.7	79.9	96.2	80.6
Fertilizer Use for Crop Production	3	-	83.4	72.7	88.6	81.6
Social Activities	3	-	65.5	65.7	77.9	69.7
Household Utensils	3	-	65.5	44.4	45.5	51.8
Residential House (Size and Quality)	3	-	59.6	38.1	51.9	49.9

Perceived benefit compared to those farmers not growing improved wheat varieties: Farmers adopting improved wheat varieties perceived positive benefits compared to farmers growing traditional varieties. About 80% of sampled farmers indicated that they were able to produce more than before and thus reduced their purchase of wheat for food (Table 3), while 72% of them reported that they were able to produce enough for annual home consumption. Moreover about 63% of wheat producers showed that they were able to produce surplus for the market and thus increase their cash income. Other benefits were also perceived by farmers including production of more crop residue for animals and crop tolerance for drought and other risks

Table 3: Perceived Benefit Compared to Those Farmers not Growing Improved Wheat Varieties.

Perceived Benefit		State				Overall (%)
		Northern (%)	River Nile (%)	Kassala (%)	Gezira (%)	
Able to produce enough for home consumption for a year		-	72.3	60.7	82.5	71.8
Able to produce more than before to reduce buying of wheat for food		-	72.7	80	86.2	79.6
Able to produce surplus for markets and increase cash income		-	64.9	47.7	75	62.5
Able to tolerance drought and other risks		-	64.9	43.8	61.2	56.6
Able to produce more crop residue for animals		-	62.1	60.1	71.2	64.5
Spend less in pest/disease control		-	72	57.7	57.5	62.4
How did the health conditions of your family change	Deteriorated	-	29.8	28.3	40	32.7
	Same	-	31.4	33.8	12.5	25.9
	Improved	-	38.8	37.9	47.5	41.4
Quality of food consumption by family change	Deteriorated	-	26.7	18.9	36.3	27.3
	Same	-	27.3	33.1	4.9	21.7
	Improved	-	46	48	58.8	50.9
Number of children from the family going to school	Deteriorated	-	26.3	19.4	32.5	26.1
	Same	-	29.3	30.9	11.2	23.8
	Improved	-	44.3	50	56.3	50.2

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Results of Secondary Data

Wheat in sudan

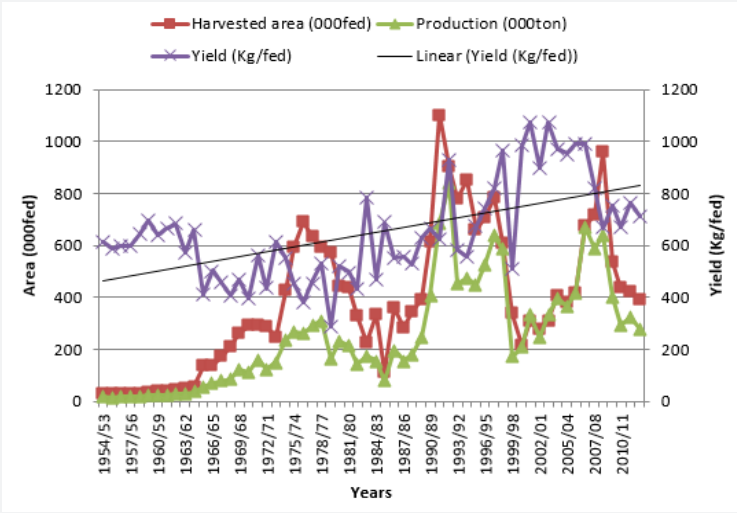

Figure 5: Wheat harvested area (000fed), production (000ton) and yield (Kg/fed) in Sudan from 1954/53 to 2012/2013.
Source: Ministry of Agriculture and Forests [4].

Figure 5 [4] presented wheat area, production and yield during 1954/53 to 2010/2011. The wheat area cultivated in Sudan in 2012-2013 is about 445 thousand feddan and the average yield is about 713Kg/fed. Wheat area showed three high peaks, mainly in 1975/76, 1990/91, and 2008/2009. Wheat yield is fluctuating but the trend line is increasing. The yield reached 800kg/fed later in 1997/98 and then increased up to 1074kg/fed in 2002/03. Then start to decrease up to 2012/2013. Ijaimi [5] indicated that the wheat yield from 1988/89 to 2004/05 significantly improved and contributed by 88% in the change in wheat yield.

Conclusion

a. Demand for wheat in Sudan increased over time to the magnitudes that could no longer be satisfied by local production and hence importation escalated in recent years.

b. Production of wheat in Sudan can be increased significantly because of the existing natural resources and research knowledge developed over time.

c. High production costs, especially fertilizers, seeds and irrigation water, coupled with humble net returns were major problems facing wheat producers.

d. Increasing productivity and development of enabling policy environment (credit, advisory services and technology transfer) are important to encourage cultivation of wheat.

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