



## Full Length Research Article

### IMPACT OF SEED DISTRIBUTION ON SUBSISTENCE FARMING PRODUCTION IN ZALINGEI AREA OF CENTRAL DARFUR STATE – SUDAN

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#### ABSTRACT

The agricultural sector is the main source of sustained growth and the backbone of Sudan's economy in terms of contribution to the gross domestic product (GDP). In Darfur Region in western Sudan, the population is predominantly rural consisting of about 89 per cent of the total with the main occupation of the people being agriculture, as their main source of food and income. The sampling technique adopted was simple random sampling while a semi-structured questionnaire was used for data collection. The analysis data explained that 84.4% of the respondents are females. Also the data revealed that about 49% of the respondents are Internal Displaced People (IDPs), because of conflict which started since 2002 in Great Darfur. The main source of seeds in the study area is mainly from previous crops (46.4%) where social network and NGOs/ Government shared by about 27% and 9.6% respectively.

**Key words:** Agriculture, Backbone, Seed Voucher, Droughts, Conflicts, Questionnaire, Sampling

#### INTRODUCTION

Agriculture remains the main source of growth and exports in Sudan, with 85 per cent of the population residing in rural areas. The sector accounts for more than 80 per cent of the country's employment. The FAO country report for 2004 indicates that the agricultural sector is the main source of sustained growth and the backbone of Sudan's economy in terms of contribution to the gross domestic product (GDP). Sudan continues to depend heavily on agriculture, whose share currently fluctuates around 40 percent of the GDP (Thabit and Hassan, 2015). A majority of Sudanese farmers (70 percent) rely on rain-fed farming for their sustenance. This is generally a low input/low yield production system characterized by small farms ranging from two to thirty hectares in size and relying on labour intensive cultivation with hand tools (Agriculture and the Environment Report, 2007). In sum, the agricultural sector in Sudan is highly vulnerable to shortages in rainfall. There has been a substantial decline in precipitation in the dry land parts of the country, and global warming models predict that this trend will continue (Agriculture and the Environment Report, 2007). Where (Hag Hamad Abdelaziz, 2010) stated that the variability of rainfall in amount and distribution from year to year plus Darfur conflict and its consequences of armed robbery and tribal conflicts that negatively affected agricultural production.

In Darfur Region in western the population is predominantly rural consisting of their main source of about 89 per cent of the total with the main occupation of the people being agriculture, as food and income (FAO, 2011). The farming systems in the area are predominantly rain-fed, traditional, and operate with limited resources. They are characterized by the small size of holdings, being dependent on manual family labour, and using few or no external inputs such as fertilizers, chemicals or seeds. Farmers have poor access to information and relevant research results, and yields obtained are very low, (Abdelrahman Khidir Osman, 2007). Supplies of certain seed crops may be limited in rain-fed subsector, but most farmers are generally trade between household (FAO, 2011).

Despite its importance, this sub-sector has suffered from low social and economic investment, resulting in negligible technical development. Given the heavy dependence on food crops produced by traditional rain-fed agriculture, however, its critical role in upholding food security cannot be overemphasized (Agriculture and the Environment Report, 2007). Poor cultural practices and planting of low yielding traditional varieties are grown. Traditional crop varieties got mixed up also – growers started to purchase seeds from the market and cultivate them. They do not know the source and quality of these seeds. The use of farmers of their own carry-over seeds was a better practice (Babiker Hassan Hamid, 2006). This study investigated local seed production to increase diversification of farming system, crop mixed and supply technology.

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## Seed Voucher and Seed Fair

Prior several decades in Darfur States a traditional systems of Seed quality control capacities were very familiar. There were so many land races and very good local varieties were known but as a result of the conflict, and drought conditions the local seeds quality control systems in Darfur Region particularly in Central Darfur State were broken down. Although much of the seed sown by farmers is generally that which has been saved from the previous harvest, seeds are also commonly acquired as loans, gifts or exchanges made with other farmers or through purchases at local markets. The grain market is an important source of seed. Farmers are careful in selecting the right variety and then regularly 'clean' it by removing broken or shriveled grains when they buy grain for use as seed. Even though traders bring grain from distant areas, farmers are aware that not all varieties are suitable to the local conditions and recognize the adapted ones (Catherine Longley, 2006 and Felix Sichali, 2013).

Over the last three decades the area has been severely affected by repeated droughts and conflicts which resulted to displace the farmers from their villages, which has resulted in partial or complete reduction or collapse of farmers' seed stock. So far seed quality control capacities became very limited, (Osman Hussien, 2013). In addition, the rainy season is becoming shorter (about 90 days), while some of the traditional varieties of millet, sorghum and cowpea are late maturing, requiring about 120 days maturing. This means that planting traditional varieties can be very risky. Farmers are well aware of this problem, and they no longer prefer these traditional varieties. Moreover some of these varieties are no longer available. Many farmers in the area became heavily dependent on relief programmes for the provision of food and seed. In several surveys conducted in the area, communities identified availability of seed as the most important constraint, and seed as the input most needed to raise productivity, (Abdelrahman Khidir Osman, 2007; Catherine Longley, 2006; Osman Hussien, 2013).

That in the past the traditional task of seed quality control was undertaken by elders (traditional gene bank) but recently seed quality control systems have been undergone and seriously damages. To repair and rebuild prior capacities may take several years and needs secure community situation and other stakeholders' contributions, (Osman Hussien, 2013). The first known situation in which seed vouchers were implemented was in a Catholic Relief Services (CRS) project responding to the needs of farmers affected by conflict in northern Uganda in 2000 (ICRISAT, 2002). Since this time, CRS has further developed and enhanced the seed voucher and fair methodology, implementing the approach in 16 countries affected by different and multiple types of disaster, including conflict, drought and flood..... etc (Catherine Longley, 2003). There are two main types of seed providers or vendors at the Region – grain traders and seed distributors. Grain traders buy grain from farmers or from other traders and sell it as seed. Seed distributors (or agro-dealers) buy seeds from seed companies or their representatives and sell them to farmers. A small number of vendors sell both grain and seed from seed companies, leading to a third category – grain traders/distributors, (Catherine Longley, 2006). The use of vouchers in emergencies to provide resources to those affected

by disaster has become increasingly popular since 2000, particularly for the provision of seed and other agricultural inputs. Voucher-based programmes are believed to have various advantages over the direct distribution of seed and agricultural inputs (Bola Amoke *et al.*, 2012). This study investigated local seed production to increase diversification of farming system, crop mixed and supply technology.

## MATERIALS AND METHODS

### Area of Study

This study was conducted in Zalingei, Central Darfur State, Sudan located between latitudes 12°30' and 13°30' N and longitudes 23°30' and 23°45' E. The population for the study comprised small-scale farmers in Zalingei area. Rain-fed farming is the most common practice. The major crop grown in this area includes millet, sorghum groundnut, and cowpeas summer crops, where vegetables such as tomatoes and hot pepper are grown as winter crops on valley's banks. The farmers in the study area use simple farm implements such as hoes, cutlass and family labour mostly.

### Data Collection

The sampling technique adopted was simple random sampling while a structured questionnaire was used for data collection. Primary data used were generated through oral interviews and 90 sets of structured questionnaires.

### Statistical Analysis

Both descriptive and quantitative analyses were used SPSS 16 program in the study. The descriptive analysis was used to analyze the socio demographic characteristics of farmer households and through cross tabulation the numerical data and figures were estimated.

## RESULTS AND DISCUSSION

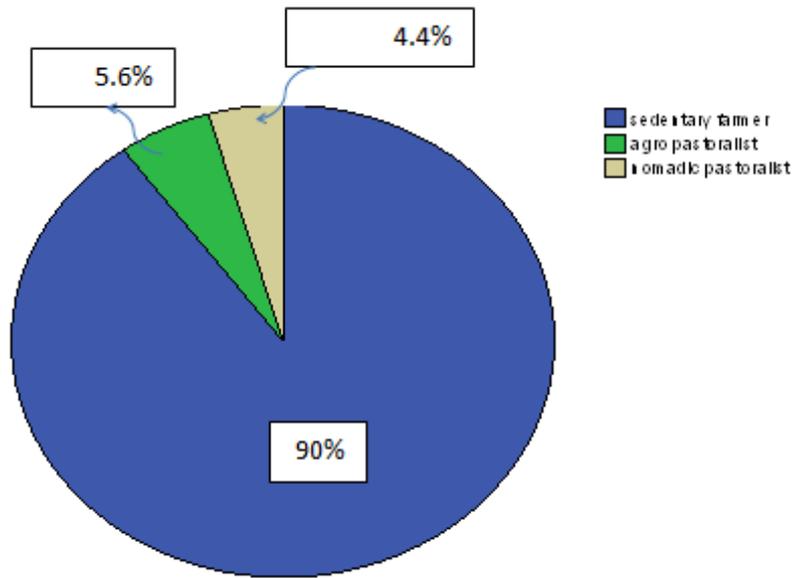
The data in Table (1) explained that 84.4% of the respondents are females means that the agriculture production in Central Darfur State is depend on females labour because most of them are heading household in the study area. Also the data revealed that about 49% of the respondents are Internal Displaced People (IDPs), because of conflict which started since 2002 in Great Darfur, Table (2). Most farmers displaced from their original productive area researching for security areas around the towns and the rest migrated to the neighbour countries (Tchad and Central Republic of Africa) as refugees. Therefore they lost all their assets and become depending on Organizations (national and International) for their livelihood. Also data showed that about 39% are temporary returnees to remote areas in raining season to farming their land About 90% of the respondents are sedentary farmers before the conflict where 6% are agro-pastoralists also affected by conflict and moved to camps round Zalingei and other towns in the area, Figure (1). The marriage in rural area and IDPs camps is very important because it increase household size and add more human power to farm practices to secure their food shortage.

**Table 1. Gender of respondents in the study area**

Gender	Mean	N	Std. Deviation	Std. Error of Mean	% of Total N	% of Total Sum
Male	2.43	14	.756	.202	15.6%	16.0%
Female	2.34	76	.703	.081	84.4%	84.0%
Total	2.36	90	.708	.075	100.0%	100.0%

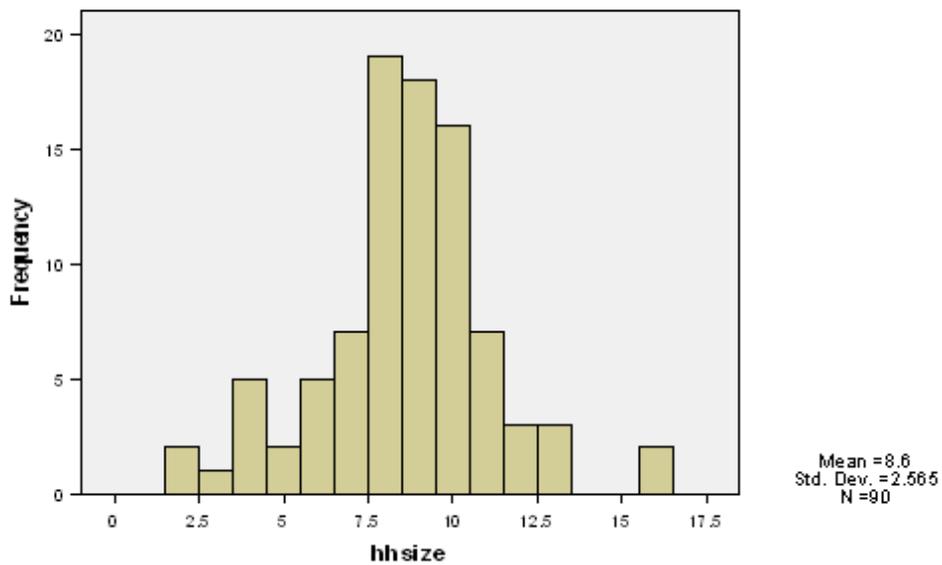
**Table 2. Situation of respondents in the study area**

Situation	Mean	N	Std. Deviation	Std. Error of Mean	% of Total N	% of Total Sum
Resident	1.83	12	.389	.112	13.3%	13.3%
Returnee	1.88	34	.327	.056	37.8%	38.6%
IDPs	1.82	44	.390	.059	48.9%	48.2%
Total	1.84	90	.364	.038	100.0%	100.0%



**Figure 1. Household Types**

**Histogram**



**Figure 2. Household Size**

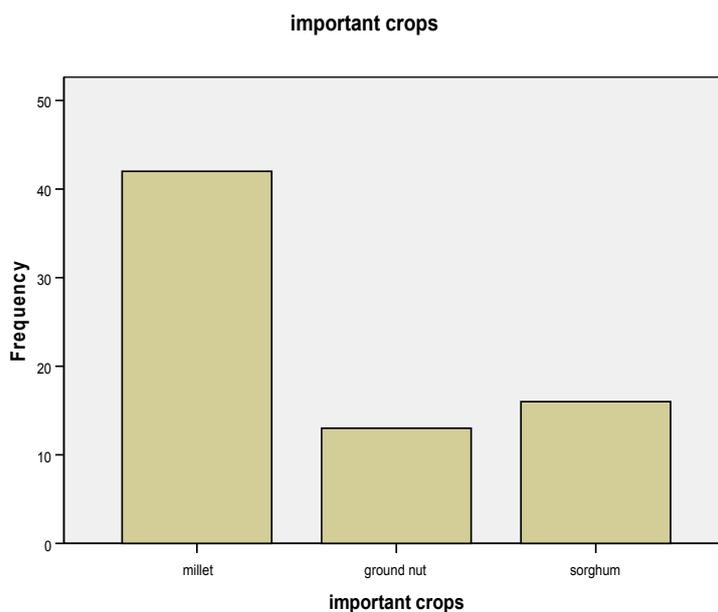


Figure 3. Important Crops cultivated in the Study Area

Table 3. Source of seeds in the study area

source of seeds	Mean	N	Std. Deviation	% of Total N	% of Total Sum
Own	2.27	26	1.867	46.4%	56.2%
Social network	1.47	15	1.060	26.8%	21.0%
Gov/NGOs	1.80	5	1.789	8.9%	8.6%
Market	1.00	6	.000	10.7%	5.7%
Borrowed	1.00	1	.	1.8%	1.0%
Gift from Relatives	1.50	2	.707	3.6%	2.9%
17	5.00	1	.	1.8%	4.8%
Total	1.88	56	1.585	100.0%	100.0%

Table 4. Prefer food grain in the study area

prefer crop seed to cultivate	Mean	N	Std. Deviation	% of Total N	% of Total Sum
Millet	1.85	41	.358	48.2%	48.4%
Groundnut	1.89	9	.333	10.6%	10.8%
Sesame	2.00	1	.	1.2%	1.3%
Luba	1.50	2	.707	2.4%	1.9%
Sorghum	1.84	32	.369	37.6%	37.6%
Total	1.85	85	.362	100.0%	100.0%

Table 5. Land tenure system

land tenure you cultivated	Mean	N	Std. Deviation	% of Total N	% of Total Sum
Own	1.56	36	.504	40.0%	43.1%
Rented	1.39	44	.493	48.9%	46.9%
Borrowed	1.30	10	.483	11.1%	10.0%
Total	1.44	90	.500	100.0%	100.0%

Table 6. Total Crop Area cultivated by respondents (feddan\*)

Crop	Frequency	%
Millet	88	23.47
Groundnut	84	22.40
Sesame	63	16.80
Cow pea	51	13.60
Sorghum	89	23.74
Total	375	100

Source: field survey 2014

One feddan = 0.42 hectare \*

The data explained that about 72% of the respondent's household size range between 6- 11 persons, Figure (2). The main important crops that cultivated in the study area are millet and sorghum as main food crops, whereas groundnuts as cash crops in addition to some trace crops like sesame, Cowpea, hot pepper....etc. Figure (3). The main source of seeds in the study area is mainly from previous crops (46.4%) and social network and NGOs/ Government shared by about 27% and 9.6% respectively. Table (3). Prefer food grains in the study area are millet by about 48.4% which is the main food grain in Western Sudan especially in Darfur and sorghum come the second food crop after millet by 37.6% where groundnut, sesame and cowpea are grown as cash crops by about 10.6%, 1.2% and 2.4% respectively and extracted oil for house consumption, Table (4).

Land tenure system in Darfur is very difficult to own land without inheritance Table (5) illustrated that 40% of respondents have their own land which was inheritance from their ancient where 60% who are rented and borrowed, 48.9% and 11.1% respectively, from those who have authority to distribute land to individuals in rural communities. The analysis of survey data displayed in Table (6) revealed that more than 47% of the area cultivated to millet and sorghum as main food grains in Darfur, 23.47% and 23.73% for millet and sorghum respectively. Whereas groundnut is the third important crop, so cowpea and sesame are produced as cash crops.

### Conclusion

The farming systems in the Darfur are predominantly rain-fed, traditional, and operate with limited resources. They are characterized by the small size of holdings, being dependent on manual family labour, and using few or no external inputs such as fertilizers, chemicals or seeds. Over the last three decades the area has been severely affected by repeated droughts and conflicts which resulted to displace the farmers from their villages, which has resulted in partial or complete reduction or collapse of farmers' seed stock. Many farmers in the area became heavily dependent on relief programmes for the provision of food and seed. About 90% of the respondents are sedentary farmers before the conflict where 6% are agropastoralists also affected by conflict and moved to camps round Zalingei and other towns in the area. The main source of seeds in the study area is mainly from previous crops (46.4%) and social network shared by about 27%.

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