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HUDUR DISTRICT, BOKOOL REGION OF SOMALIA: IMPACT OF DROUGHT ON SORGHUM PRODUCTION

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Abstract

Droughts in Sub-Saharan Africa (SSA) are a major cause of economic losses, accounting for almost 70% of all losses. The majority of people in Somalia, a nation in Sub-Saharan Africa, rely on rain-fed crops due to the country's semi-arid environment and recent severe drought. The goal of the study was to find out how the drought in Somalia's Hudur district and Bokool area affected the production of sorghum. Data were gathered utilizing a structured questionnaire and interviews with 318 respondents as part of a cross-sectional study design. This study revealed a high frequency of drought in the Bokool region of Somalia's Hudur district, which had a significant impact on sorghum crop output. This indicates that the Hudur district's drought negatively impacts businesses that generate revenue there, particularly those whose primary industry is sorghum growing. Thus, it is important to plant drought-resistant agricultural types and crops that require less water.

Keywords: income, Husdur, sorghum, Somalia, and drought

Introduction

When precipitation falls below the yearly average and causes acute water shortage, droughts are unanticipated extreme hydrological occurrences (Isak, 2022). Every year, millions of people are impacted by drought and overload catastrophes.

Drought is defined as a state in which plants' turgor and water potential are diminished to the extent that they are unable to perform their regular physiological functions (Ndjiondjop et al., 2018). Droughts affect an estimated 55 million people worldwide and are the biggest threat to crops and animals in almost every region of the world (Carrao et al., 2016). Globally, drought has severe socioeconomic effects and is challenging to manage because of its unpredictable occurrence. Africa's vulnerability to drought is increasing due to climate change. With billions of poor people in sub-Saharan Africa (SSA), climate change threatens both frequent and severe extreme events in Africa. Climate variability and unpredictability are a significant problem and a concern (Shiferaw et al., 2014) There are four categories into which droughts can be classified: Meteorological drought, which is characterized by climatic variables such as precipitation and humidity; Hydrological drought, the second type of drought, is linked to the impact of periods of insufficient rainfall on the water levels of rivers, reservoirs, lakes, and aquifers; and Agricultural

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drought, the third type, which happens when there is insufficient water available for a specific crop to grow at a specific time (Abulkadir, 2017).

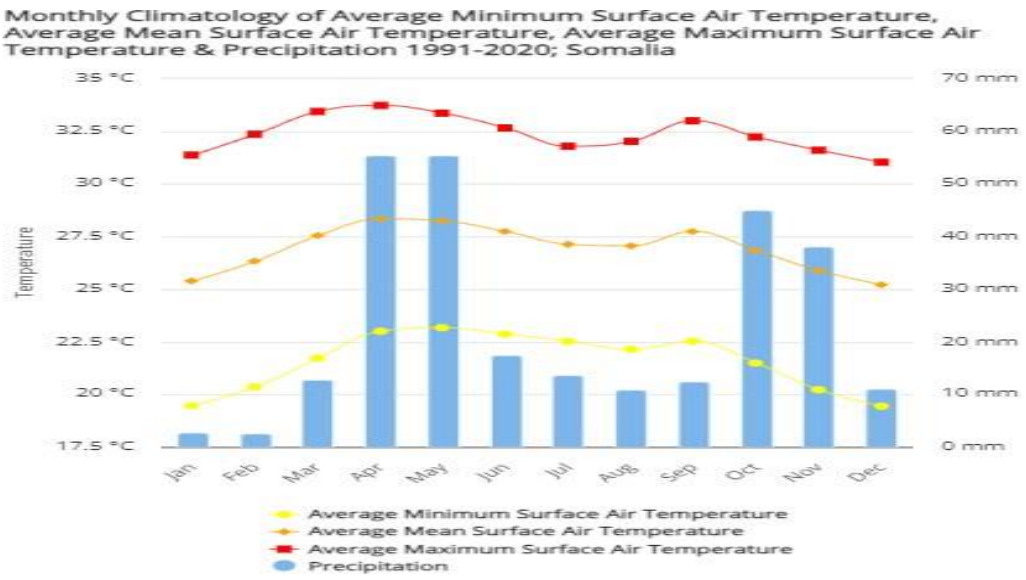
According to the World Bank, up to 216 million people—mostly from developing countries—could be compelled to migrate by 2050 as a result of issues including drought, water scarcity, falling agriculture yield, sea-level rise, and overpopulation. (The World Bank, 2021) Globally, agriculture has a significant impact on national economies. Smallholders account for up to 90% of agricultural production in East African nations, where they dominate the agricultural sector (Adhikari et al., 2015). As one of the growing post-conflict nations that has endured many natural catastrophes and a degraded natural environment, Somalia has been devastated by hostilities over the past 20 years. A reduced production of sorghum plants can be caused by severe drought and water constraints, which can prevent fertilization or cause the spikes to dry up during the flowering stage (Srivastava, et al., 2010). The main industry of Somalia and a major contributor to its economy is agricultural output. It makes up over 65% of the GDP. Tens of thousands of tons of products were exported by the Somali government before to the civil war, but as the country's central government fell in 1991, so did Somalia's standing in the global market for the production of fruits and crops (Soojeede Abdi, 2018)

In Somalia, sorghum is the most significant crop. Both human and animal feed is made from it. Sorghum's widespread cultivation in Somalia is evidence of its adaptability to our region, which is characterized as an arid to semi-arid zone. Mao Haj Edi and colleagues, 1986)

Impact of climate change on Somalia's sorghum output

Global concerns about climate change impact every country. The impacts of the region's high degree of climate change and inadequate coping mechanisms are felt throughout sub-Saharan Africa, therefore coordination and collaboration at both the regional and global levels will be necessary to develop answers. The equator crosses Somalia in the south, and the country is situated in the eastern portion of the Horn of Africa. It experiences semi-arid weather in the south and warm desert weather in the north (Eklow and Krampe, 2019).

Figure: 1. Monthly climatology average 1990-2020; Somalia.



Data source: word bank (2022)

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Somalia ranks among the ten most vulnerable nations in the world that found in Africa (ICRC,2021)

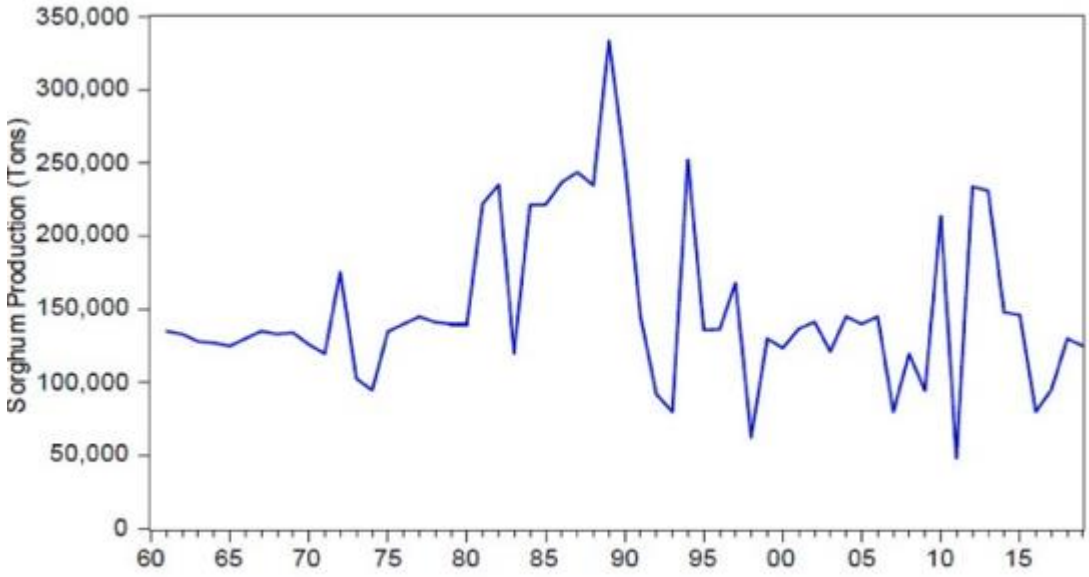
Africa's biggest problems with agricultural production and food security are drought and climate change. The majority of Africa's agriculture is dependent on rainfall, as only about 5% of its total cultivated area is irrigated(Ndjiondjop et al., 2018)

Because Somalia has a semi-arid and dry climate and the majority of the population depends on the rainy seasons for their livelihood, the pattern of rainfall in the nation is the most important component of the country's climate. The year is 2022).

Since sorghum is a robust grain that can thrive in climatically unstable locations like semi-arid and sub-humid agroecological zones, it has always been faced with harsh weather conditions. Sorghum is the principal crop farmed in Somalia. Crop loss occurs when sorghum is impacted by climatic variations mainly in the breeding or grain-filling phases. For instance, higher temperatures significantly affects sorghum yields by influencing the pace at which biomass accumulates, the length of time it takes for the crop to mature, the viability of the pollen, and the seed set (Vara Prasad & Staggenborg, 2008) Reduced fertilization or spike drying from drought or extreme water scarcity can result in decreased yields during the blooming phase of sorghum plants. In 2022, Warsame et al.

FIGURE 2.0: PRODUCTION OF SORGHUM IN SOMALIA FROM 1960 TO 2019

SOURCE: FAO (2020)



The empirical evidence of how climatic and non-climate factors, in particular rainfall, temperature, labor in agriculture, and political instability, affect sorghum output in Somalia is yet unclear.

Reducing the vulnerabilities caused by climate change for the poorest communities in Somalia is the aim; these groups comprise the 65% of the population that depend on agriculture and pastoralism for natural resources. Due to erratic rainfall patterns, rising temperatures, and the loss of lives and livelihoods brought on by natural disasters, these industries are most severely impacted by decreasing productivity. About 60% of Somalia's 14.3 million people are semi-nomadic

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or nomadic, and 60% of them reside in rural regions (FGS, 2020). In line with many sub-Saharan African nations, the ENVIRONMENTAL AND CLIMATE CHANGE MINISTRY (2022)

From 1901 to 2015, Somalia's long (gu') and short (deyr) rain patterns show no appreciable variations in the total quantity of rainfall (World Bank, 2020). Nonetheless, other data indicates a decline in precipitation linked to climatic variability, particularly in the past few decades, which has dire ramifications for the nation's livestock and agricultural output. Rainfall in Somalia is erratic and insufficient, with the exception of the southwest, which receives an average of 700 mm annually. The main factor influencing Somalia's rainfall is the Inter-Tropical Convergence Zone. (ITCZ), monsoonal winds, ocean currents, jet streams, such as the "Somali Jetstream," easterly waves, tropical cyclones, conditions in the Indian and Red Seas, and links to a number of regional and global climate systems. Ajuang Ogallo and associates, 2017

In Somalia, there are four different seasons, with two dry ones, called Jiilaal from December to March and Xagga from July to September. Additionally, there are two rainy seasons: April through June (Gu) and October through November (Deyr), with the possibility of September overlap.(Ogallo Ajuang and others, 2017)

In South West State, the Gu' rain season was belated, and the rain that did fall was primarily in the form of light showers that were unevenly distributed over the districts of Bay, Bakool, and Lower Shabelle. The worst famine in three years struck most of South West State's rural districts, leading to the largest number of internally displaced Somalians as a result of the drought. For example, there are still over 320,000 people living in the Bay region, most of whom live in IDP camps (WFP Somalia, 2019).

On average, the country receives 250 mm of rain annually. The incredibly arid and warm northern coastal plains get less than 250 mm of rain on average year; in the south and southwest, this number increases to around 400 mm. FAO (1995). The semi-arid central portions of the nation receive just 50 to 100 mm of rainfall annually. Only a tiny section of Somalia's coastline is classified as sub-humid. (National Resources Ministry, 2013) Sorghum output has decreased significantly since the crisis in Somalia began, from a peak of 330,000 tons in 1990 to about 80,000 tons in 1991. the disintegration of institutions and public space.

Technique and Content

A cross-sectional survey research strategy was used for the study, which was conducted in the Hudur district capital city of the Bakool area in the southwest state of Somalia. A questionnaire and interview guide were used to gather the data for the study.

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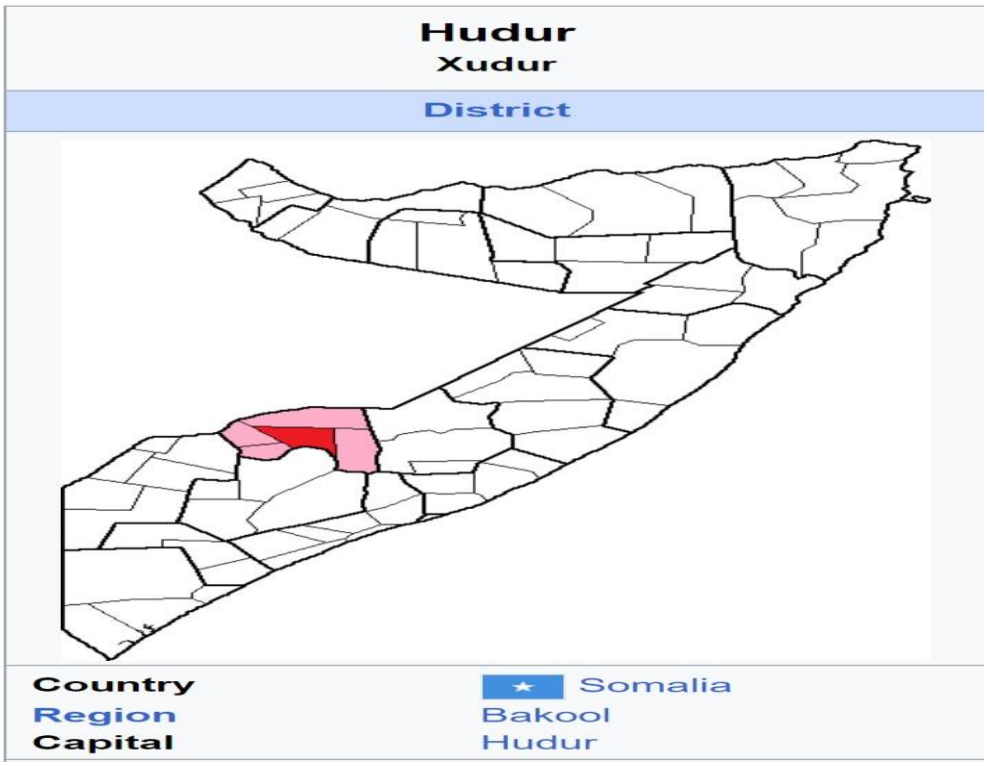
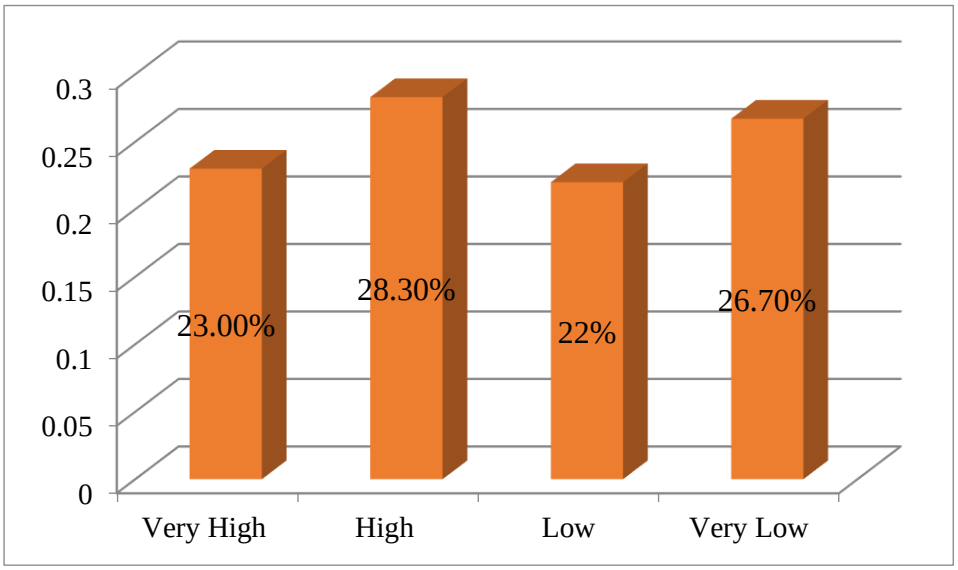


Examination of Data

Following data collection and clearance, an analysis was conducted on the quantitative data. The SPSS version 26 was used for the analysis. A content analysis was performed on the interview data.

Outcomes

Figure 1: The extent of drought in the Bakool area of Somalia's Hudur district



Source: 2023 Field Data

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Table 1.2: Sorghum crop output in Hudur district, Bakool region, Somalia, as affected by the occurrence of drought

Reactions		Regularity	Percentage
	Seeds do not sprout	112	35.2
	Stems get stunted	55	17.3
	Crops do not produce grain	24	7.5
	Crop yields are low.	56	17.6
	Crops wither away entirely.	71	22.3
	Total	**318**	**100.0**

Impact of drought prevalence on sorghum crop production in Hudur district, Bakool region, Somalia: according to responses regarding the impact of drought prevalence, 112 (35.2%) respondents agreed that drought causes seeds to not germinate, 55 (17.3%) respondents claimed that crops become stunted, 71 (22.3%) respondents claimed that crops completely die, and 24 (7.5%) respondents claimed that crops yield poorly.

Table 3.0: Bivariate study of the relationship between the occurrence of drought and sorghum crop output in the Somali area of Bakool's Hudur district

Variable	Responses	Yes	No	X^2	P-value
Affected Sorghum Production by Drought Prevalence	Yes	119	93	4.605	0.040*
	No	65	41		
Some seeds do not sprout		45	21	5.432	0.000
Plants get stunted		37	24		
Grain is not produced by crops.		45	23		
Crop yields are subpar.		49	19		
Complete death of crops		35	20		

Data from the field, 2023 ** significantly significant at P<0.05

The current bivariate study of how drought prevalence impacts sorghum crop production in Hudur district, Bakool area, Somalia ($X2 = 4.605$, $p = 0.040$) and how drought prevalence influences sorghum crop production ($X2 = 5.432$, $p = 0.000$) is supported by the chi-square test findings shown in Table 3.0. This suggests that the output of sorghum in the Hudur area is significantly impacted by the occurrence of drought. The findings show that the drought significantly affects the drought, i.e., a rise in the occurrence of the drought raises sorghum output.

The result of an interview conducted

How has the drought affected the production of sorghum in the Hudur area in the Bakool Region of Somalia?

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Speaking with Agricultural Officers

According to the study's findings, the drought in Hudur district, Bakool area, Somalia, restricts the predominance of the Sorghum crop because it causes a large number of crops to perish in the environment, which in turn restricts the crop's ability to flourish. The environment's crop yields are not very successful in producing food for humans or as a means of communal survival.

Agricultural officer interview

Since sorghum farming is the district's primary source of revenue generation and food security, the drought in the Bakool area of Somalia has typically had an impact on these aspects.

Speak with an environmental officer

Further information obtained from environmental interviews indicates that the soil is usually dry due to the drought, making it challenging to till. Crop output has been largely restricted by the drought. Many of the crops perish in their early years, even when they are cultivated. The phenomenon has persisted, and as a result of its restricted efficacy, the drought's reach is constrained, lowering the district's level of productive agricultural yields.

Talk and Debate

According to an analysis of how drought prevalence affects sorghum crop production in Hudur district, Bakool region of Somalia, the results indicate that the current drought has a significant relation on sorghum production, meaning that an increase in drought prevalence, decreases Sorghum production. The majority of respondents agreed that at least three months of drought occur every year, and the main effect is seed's failure to germinate.

According to Boukary, Diaw, and Wünscher (2016), drought-adaptive genes on crops like sorghum grown in water-limited environments can only be evaluated when the system as a whole is taken into account in terms of yield potential, drought resistance, and water use efficiency. These findings are consistent with their arguments.

Final Verdict

According to the report, sorghum production is severely hampered in the Hudur district of Somalia's Bokool region. The study concludes that sorghum, a significant crop in the Hudur area, has always been in danger and that ongoing drought significantly impairs agricultural harvests and production plans. The findings indicate that hazards associated with drought are generally unfavorable.

Suggestions

The research suggests that a program of water conservation be implemented in regions of the nation that are prone to drought in order to provide irrigation for sorghum during dry spells. gathering rainwater Additionally, it is necessary to introduce crops that use less water, and kinds of crops resistant to drought should be investigated in order to boost resistance to drought and lower crop failure during dry spells. Advises farmers and pastoralists to be aware of the significance of preventing environmental damage, and launch an additional revenue-generating venture.

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