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Sudan, Malnutrition

**Sudan: A Multifaceted Solution to Malnutrition**

The African country of Sudan has been experiencing difficulties regarding malnutrition since its independence, with recent conflicts turning what was once a pressing issue into a global food insecurity emergency. By increasing the availability of medical stabilization centers and nutrient-dense Ready-to-Use Therapeutic Food, the country of Sudan can reduce its skyrocketing severe acute malnutrition rates.

Sudan is a country located in Northeast Africa, with a population of 45.66 million civilians. The capital city, Khartoum, is located centrally and acts as a hub for trade and communications. Sudan was formerly a British colony, and after spending 57 years under another state’s control, the nation became independent in 1956 (Sikainga et al). While the country is rich in natural resources, political instability hinders economic development, forcing its financial sector to remain predominantly agricultural. Possessing a gross domestic product (GDP) per capita of 1330 dollars and registering as a low-income nation, Sudan is one of the poorest countries in the world (BBC). Its low GDP considerably impacts the well-being of families and the overall structure of the country.

The family unit in Sudan is similar to that of many African countries. Families are patriarchal, with the father being responsible for the members and affairs of the household. Moreover, societal status is often tied to the number of wives a man possesses, and the women’s priority in the family is determined by their personal wealth, power, and prestige. It is common to live with extended family, and up to three generations typically live under one roof. Additionally, around seven children is the norm for a Sudanese family, though this number is significantly lower in urban areas. Behavioral expectations are strict, and bringing shame to the family, or violating cultural taboos, provides the grounds for grave punishment. Furthermore, sons are viewed as economic prospects who bear the responsibility of caring for their mothers and sisters as they grow older. Conversely, daughters are viewed as liabilities due to the societal expectations of women within the country. Women’s lives are largely dictated by the men in their family, so until they marry, they are under the authority of their fathers and brothers. Females are less likely to be prioritized in regards to education, and are often placed in arranged marriages (*Sudan: Family*).

A lack of federal funding has led to emphasis being placed on basic, primary schooling. Young boys typically attend primary school from ages six to fourteen, and local leaders determine whether or not young girls are allowed to enroll. Though secondary schooling is offered, the enrollment rate sits at a low of 21 percent. The age at which adolescents begin secondary education often corresponds with the time when young men join the military and young women stay at home, resulting in minimal attendance. Higher schooling is present, but the quality of education is difficult to determine, as is similar to many governmentally-funded institutions in the country. The Sudanese government funnels a majority of its capital into military-based organizations, leaving others, like the educational and medical programs, with little to work with (Scholaro).

In Sudan, the healthcare system is incredibly fragile and of poor quality. Immense disparities in the caliber of medical assistance are present between rich and poor individuals, as well as between urban and rural dwellers. Insufficient investment results in roughly eight million children throughout the country who are without access to vital services. Moreover, 30 percent of the population lives farther than thirty minutes away from any type of medical facility. A startling fact, only half of the medical workers in these centers are professionally trained (UNICEF-*Health*). Tropical diseases, including malaria and dengue fever, are rampant throughout the nation as a result of its climate, but are often left untreated due to inexperienced workers and an absence of necessary medical supplies (*Sudan’s Tropical Disease)*.

Due to its location in the Sahara Desert, Sudan’s climate is characterized by hot and dry conditions. As one heads south, the amount of rainfall increases, and the terrain becomes more lush, eventually giving way to thriving savannahs in the far south. Acacia and Baobab trees, as well as a variety of shrubs and grasses, dominate the flat plains and plateaus of the country. Surrounding territories include Egypt to the north, South Sudan to the south, Libya to the northwest, the Central African Republic and Chad to the west, and the Red Sea, Ethiopia, and Eritrea to the east (Sikainga et al). The effects of global climate change have been acute for Sudan, with increasingly erratic and extreme weather patterns being indicated. Such effects have been catastrophic to the agricultural sector of the country (International Rescue Committee-*Fighting in Sudan*).

Agriculture is vital to the economy in Sudan. A large majority of the workforce is employed in an occupation related to farming, and the economy of the country is reliant on husbandry. Subsistence agriculture is the dominant method of farming, with plots typically being five acres or less. An estimated 51.5 million acres of land are cultivable, 4.3 million of which are irrigated. Filled with ample fertile land, the nation possesses significant potential for agricultural prosperity. However, ethnic disputes have impeded the likelihood of this occurrence (International Trade Administration).

The spiritual and cultural makeup of Sudan has been an ever-present point of contention. The dominant ethnic group, which consists mainly of Islam-practicing, Arab individuals, resides in the northern half of the state. Sudan’s southern region, however, is more diverse, boasting a variety of religions and ethnicities. The first Sudanese Civil War occurred between 1955 and 1972 and was a dispute between the ethnically and religiously dissimilar north and south. The second civil war, which was largely a continuation of the first, was between the Central Sudanese Government and the Sudan People’s Liberation Army of South Sudan. This war spanned from 1983 to 2005 (BBC). As the North continues to push its ideal of becoming a fully Islamic state, the residents of the South remain oppressed. The buildup of these conflicts, plus others that have occurred in Darfur since, are what eventually led to the succession of South Sudan, and more recently, the active conflict in Khartoum.

On April 15, 2023, conflict broke out in Khartoum between the Rapid Support Forces (RSF) and the Sudanese Army Forces (SAF) (UNICEF Sudan). The RSF is a militant group created from the former Janjaweed militia, a force employed by the long-ruling authoritarian president Omar al-Bashir. The militia had a reputation for ruthless behavior and was accused by the International Criminal Court of committing genocide, war crimes, and crimes against humanity. Though the syndicate eventually dissolved, the RSF quickly took its place and ousted President al-Bashir in 2019. Since then, the RSF has made efforts to be legitimized as a government-based army rather than a militia. Setbacks in this transition, as well as concerns about the ethicality of the group, led to the present fighting in Sudan’s capital city (Maclean).

The ongoing conflict in Sudan has only heightened an already imminent issue in the country: severe acute malnutrition (SAM). Before the incident on April 15, roughly 24 million people were facing issues related to hunger. As a consequence of the fighting, an estimated 42 percent of the population is currently suffering from food insecurity and malnutrition. Five International Rescue Committee-supported medical clinics in the Al-Jazirah state recorded, on average, a 31.65-percent increase in the number of malnutrition cases since the beginning of the war. One of these facilities, which typically reports ten to fifteen SAM patients a month, is now reporting around 56 cases monthly (International Rescue Committee-*Fighting in Sudan*). Moreover, the Hantoub and Banet areas exhibited a 300 and 163 percent increase respectively since the conflict began (International Rescue Committee-*Sudan*).

Malnutrition in Sudan is triggered not only by a lack of food but also a lack of nutritious sustenance that contains the necessary macronutrients for survival (UNICEF-*Malnutrition in Sudan*). Severe acute malnutrition is defined in two forms: complicated and uncomplicated. With uncomplicated SAM, the affected individual remains alert, retains their appetite, and stays clinically fit. While their symptoms remain invisible, the under consumption of nutritious food continues to weaken their immune system, which can later lead to dire health consequences. Those with the uncomplicated condition also lack any additional diseases that may worsen their state. Complicated SAM, on the other hand, is present when the affected individual experiences severe edema, or a buildup of fluid causing swollen limbs, along with metabolic disturbances, infections or other diseases, and a loss of appetite (Jones and Berkley). Both ailments are equally prevalent within the state.

The issue of malnutrition has been a recurring cycle within the country of Sudan. Women and children are the most impacted demographic groups, making up 90 percent of the population of refugees crossing the Sudanese borders into surrounding countries. One-fifth of these individuals cross the border with a form of undernourishment (International Rescue Committee*-Fighting in Sudan*). Furthermore, the effects of severe acute malnutrition on soon-to-be mothers are catastrophic to infants in the womb. Improper dietary patterns during pregnancy can cause intestinal, immune, and stunted growth issues within a growing fetus, which makes the child more susceptible to additional diseases after birth. Furthermore, as an individual becomes more malnourished, they become more vulnerable to various ailments. These illnesses can further exacerbate their previous symptoms (UNICEF Sudan). This creates a vicious cycle that can be nearly impossible to eradicate for struggling refugees and internally displaced persons (IDPs).

The recent conflict in Khartoum has only aggravated a pressing issue in the country. Before the war, regions all over Sudan had been experiencing dramatic climate shocks. Dry and sweltering weather, along with unpredictable rainfall and extreme natural events, has hindered the agricultural productivity of farmers all over the country. Rural, subsistence farmers like those common in Sudan rely on predictable rainfall and weather patterns for their crops and livestock to succeed (International Rescue Committee-*Fighting in Sudan*). Without these key factors, many are left without food and a source of income. Correspondingly, violent events as a result of the ongoing conflict have destroyed much of the arable land used by agriculturalists (US for the UN High Commissioner for Refugees). Phenomena such as these have contributed to the skyrocketing economic inflation present within the country, with rates of around 200 and 150 percent being recorded for the years of 2022 and 2023 respectively. Moreover, obstacles like the ongoing war in Ukraine have halted the entrance of wheat into the country by its top importer, Russia (International Rescue Committee-*Fighting in Sudan*). These combined political and climate components have contributed to the malnutrition crisis in Sudan being considered one of the worst food insecurity emergencies in the world.

To address this dilemma, one must fully comprehend the necessary steps to be taken. For malnutrition treatment, there are two main phases: stabilization and rehabilitation. Stabilization refers to the time when affected individuals are treated for their immediate state. Through various treatments, those afflicted with SAM are steadied to the point where they lack the most dire and immediate symptoms of the disease. Rehabilitation refers to when patients are nursed back to proper health (Schoonees et al). Once the severe effects of the ailment have been dealt with, the rehabilitation process allows patients to gain back their lost strength and nutrients. Both phases of the disease can be dealt with at home or at a medical facility, though the best option for care may vary depending on the complication levels of an afflicted individual’s condition.

Though the root cause of malnutrition in Sudan is the persistent fighting within the country, the inability to treat those who have been affected is an equally relevant problem. Many Sudanese struggle to reach hospitals that can properly treat SAM. A majority of citizens live in rural areas and are supported by their local agricultural pursuits, while most medical treatment sites are located in the more densely populated urban locations. Additionally, these establishments are often of questionable quality and are staffed with improperly educated employees. Poor hygienic procedures and understocked materials, as well as insufficient sanitation and water quality, are often noted at these medical institutions (UNICEF-*Health*).

The construction of new, rurally based medical stabilization facilities staffed with properly educated employees would be incredibly beneficial to the current malnourishment crisis. These centers would be distributed throughout the rural areas of Sudan’s 18 states. Regions that struggle the most with insecurity, inaccessibility, and poverty, like South Kordofan, Western Darfur, and Central Darfur, may be targeted to a greater degree to fit their more pressing needs (African Development Bank Group). These facilities would carry medical supplies necessary for treating severe acute malnutrition such as nutrient-dense supplements, electrolyte-enhanced liquids, and certain vaccines required for the stabilization and rehabilitation of patients. Additionally, medical staff would be appropriately educated regarding the effects, symptoms, and treatment of malnutrition, a problem often observed in the current hospitals of Sudan. Adequate sanitation and hygiene practices would be taught and enforced to all who work in these establishments. Moreover, methods to maintain clean water would be provided. By creating new centers specific to the treatment of malnutrition, as well as keeping these facilities filled with educated medical workers and vital medicaments, the people of Sudan can be saved from the vicious illness that has plagued their nation for years.

While the construction of new medical sites in rural states would be paramount to the reduction of SAM in Sudan, the improvement of current hospitals and medical centers should be discussed as well. Many citizens living in urban areas are within a reasonable distance from a hospital, but these facilities are inadequately equipped for treating their condition (UNICEF-*Health*). Furthermore, these hospitals are often not qualified to handle mothers and young children, who are the demographic groups most impacted by malnutrition (UNICEF Sudan). Focusing on the improvement of current medical facilities can aid those living in urban areas by providing a more reliable option for remedying malnutrition.

The World Health Organization (WHO) has experimented with the implementation of medical stabilization sites in ten Sudanese states, and the results from this project have been splendid. The organization has built 91 healthcare centers since the commencement of its project, and 156 healthcare workers have been trained in the diagnosis and treatment of SAM. Additionally, these employees have been educated on the appropriate measures to take if the disease shows complications (World Health Organization-*WHO nutrition interventions*). The WHO has also been providing these newly built establishments with renewable medical resources to ensure that they will always be able to adequately provide for their patients. Sudan can move towards a prosperous future by expanding the reach of a project similar to this one, and by using the techniques employed by the WHO to enhance current hospitals.

Though in-hospital care is ideal, it is not a plausible method for all Sudanese citizens and IDPs. The development of Ready-To-Use Therapeutic Food (RUTF) has been a huge milestone in the treatment of SAM. RUTF is a nutrient-dense supplement that can be used in both the rehabilitation and stabilization phases of malnutrition (UNICEF-*USAID*). RUTF cartons can be used anywhere and do not require refrigeration. They consist of a variety of nutritious materials, such as milk powder, vegetable oil, sugar, peanut butter, essential vitamins, and beneficial minerals. These packages are relatively inexpensive to produce and have a considerably long shelf life, acting as a life-saving commodity for those who cannot access a medical facility (Schoonees et al). Furthermore, research conducted by the United Nations Children’s Fund (UNICEF) has explored the possibility of utilizing locally grown, protein-dense Sudanese peanuts for RUTF, acting as a humanitarian and economic prospect for residents of Sudan

(UNICEF-*Malnutrition in Sudan*).

RUTF is revolutionary for providing quick nourishment to patients, but is best paired with a variety of vaccines that can help prevent further complications from malnourishment. These vaccines, which can often seem unattainable for the average citizen in Sudan, can be packed together with RUTF and other resources to create a malnutrition treatment module (World Health Organization-*New Kit for the treatment*). Drugs like oral amoxicillin can be used to treat milder cases, while parenteral benzylpenicillin and gentamicin can be utilized for situations of higher risk (Williams and Berkley). In addition, these kits would include certain beneficial medical equipment, such as needles, syringes, and antibacterial sanitary products, along with vaccines for commonly contracted diseases, like malaria (World Health Organization-*WHO nutrition interventions*). These modules filled with RUTF and medicaments allow malnutrition-afflicted individuals to treat their illness without the need for a hospital.

Sudan can reduce its increasing severe acute malnutrition rates by providing more RUTF supplement kits and by creating medical stabilization centers. The state’s battle with undernourishment has been persistent, with climate shocks and political instability only increasing the severity of the issue. With the help of innovative solutions and the research of humanitarian organizations around the globe, Sudan can take the first steps towards a future where every citizen has access to nutritious meals.

Bibliography

African Development Bank Group. “AfDB SUDAN POVERTY PROFILE.” *African Development Bank*, June 2018, https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/Brief-Sudan\_Poverty\_Profile\_2014-2015\_-\_Key\_Findings.pdf. Accessed 22 February 2024.

BBC. “Sudan Country Profile.” *BBC*, 13 September 2023, https://www.bbc.com/news/world-africa-14094995. Accessed 12 December 2023.

Berkley, James A., and Kelsey DJ Jones. “Severe acute malnutrition and infection - PMC.” *NCBI*, 2008, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4266374/. Accessed 1 February 2024.F

European Civil Protection and Humanitarian Aid Operations. “Conflict in Sudan deepens malnutrition crisis.” *Language selection | European Civil Protection and Humanitarian Aid Operations*, 5 October 2023, https://civil-protection-humanitarian-aid.ec.europa.eu/news-stories/stories/conflict-sudan-deepens-malnutrition-crisis\_en. Accessed 6 December 2023.

International Rescue Committee. “Fighting in Sudan: What you need to know about the crisis.” *International Rescue Committee*, 27 November 2023, https://www.rescue.org/article/fighting-sudan-what-you-need-know-about-crisis. Accessed 6 December 2023.

International Rescue Committee. “Sudan: IRC calls for urgent action as 300% surge in malnutrition cases recorded in IRC clinic since conflict started - Sudan.” *ReliefWeb*, 6 September 2023, https://reliefweb.int/report/sudan/sudan-irc-calls-urgent-action-300-surge-malnutrition-cases-recorded-irc-clinic-conflict-started. Accessed 6 December 2023.

International Trade Administration. “Sudan - Agricultural Sectors.” *International Trade Administration*, 30 July 2022, https://www.trade.gov/country-commercial-guides/sudan-agricultural-sectors. Accessed 18 December 2023.

Maclean, William. “Who are Sudan's Rapid Support Forces?” *Reuters*, 13 April 2023, https://www.reuters.com/world/africa/who-are-sudans-rapid-support-forces-2023-04-13/. Accessed 6 December 2023.

Mountain-Plains Information Office. “Consumer Price Index, Midwest Region – December 2022 : Mountain–Plains Information Office : U.S.” *Bureau of Labor Statistics*, 12 January 2023, https://www.bls.gov/regions/mountain-plains/news-release/consumerpriceindex\_midwest.htm. Accessed 17 January 2023.

Schoonees, Anel., et al. “Ready‐to‐use therapeutic food (RUTF) for home‐based nutritional rehabilitation of severe acute malnutrition in children from six months to five years of age.” *NCBI*, 15 May 2019, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6537457/. Accessed 13 December 2023.

Scholaro. “Sudan Education System.” *Scholaro*, June 2011, https://www.scholaro.com/db/Countries/Sudan/Education-System. Accessed 18 December 2023.

Sikainga, Ahmad A., et al. “Sudan | History, Map, Area, Population, Religion, & Facts.” *Britannica*, 16 December 2023, https://www.britannica.com/place/Sudan. Accessed 18 December 2023.

"Sudan: Family." *CultureGrams Online Edition*, ProQuest, 2023, online.culturegrams.com/world/world\_country\_sections.php?cid=152&cn=Sudan&sname=Family&snid=11. Accessed 05 December 2023.

“Sudan's Tropical Disease Spike Reflects Poor Health System.” *VOA News*, 9 February 2023, https://www.voanews.com/amp/sudan-s-tropical-disease-spike-reflects-poor-health-system-/6955005.html. Accessed 28 March 2024.

UNICEF. “Health.” *UNICEF*, 2023, https://www.unicef.org/sudan/health. Accessed 18 December 2023.

UNICEF. “Malnutrition in Sudan.” *UNICEF*, 2023, https://www.unicef.org/sudan/malnutrition. Accessed 12 December 2023.

UNICEF. “USAID provides lifesaving nutrition supplies to treat malnourished children in Sudan.” *UNICEF*, 16 March 2023, https://www.unicef.org/sudan/press-releases/usaid-provides-lifesaving-nutrition-supplies-treat-malnourished-children-sudan. Accessed 14 December 2023.

UNICEF Sudan. “Nutrition.” *UNICEF*, 2023, https://www.unicef.org/sudan/nutrition. Accessed 13 December 2023.

The United States for the United Nations High Commissioner for Refugees. “Sudan Crisis Explained.” *USA for UNHCR*, 14 July 2023, https://www.unrefugees.org/news/sudan-crisis-explained/. Accessed 6 December 2023.

Williams, Phoebe CM, and James A. Berkley. “Guidelines for the treatment of severe acute malnutrition: a systematic review of the evidence for antimicrobial therapy.” *NCBI*, 23 May 2018, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5972636/. Accessed 14 December 2023.

World Food Programme. “Sudan emergency | World Food Programme.” *WFP*, 2023, https://www.wfp.org/emergencies/sudan-emergency. Accessed 13 December 2023.

World Food Programme. “Sudan | World Food Programme.” *WFP*, 2023, https://www.wfp.org/countries/sudan. Accessed 6 December 2023.

World Food Program USA. “Food Assistance, Cash and InKind.” *World Food Program USA*, 2023, https://www.wfpusa.org/programs/food-cash/. Accessed 13 December 2023.

World Food Program USA. “Small Scale Farmers.” *World Food Program USA*, 2023, https://www.wfpusa.org/programs/farming/. Accessed 13 December 2023.

World Health Organization. “New Kit for the treatment of Severe Acute Malnutrition launched by WHO in South Sudan.” *World Health Organization (WHO)*, 6 June 2016, https://www.who.int/news/item/06-06-2016-new-kit-for-the-treatment-of-severe-acute-malnutrition-launched-by-who-in-south-sudan. Accessed 14 December 2023.

World Health Organization. “WHO nutrition interventions help save the lives of malnourished Sudanese children.” *EMRO*, 16 August 2023, https://www.emro.who.int/sdn/sudan-news/who-nutrition-interventions-help-save-the-lives-of-malnourished-sudanese-children.html. Accessed 13 December 2023.