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South Sudan: Malnutrition
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South Sudan: Building Adaptive Flood Infrastructure to Reduce Hunger

Introduction & Country Overview

While a select portion of the world debates new fad diets and food trends, several million people in South Sudan are fighting every day to survive without reliable access to food. South Sudan gained its independence from Sudan in 2011, making it the world's youngest nation. According to data from the World Food Programme, "Nearly 65% of the population is experiencing a hunger crisis." (WFP) This statistic shows how widespread and normalized food insecurity has become. Despite the hope that independence brought, the country soon fell into civil war in 2013, displacing millions of people and damaging already limited infrastructure. Ongoing political tensions and localized violence have made it difficult for a stable economy or investment in long-term development. As a result, South Sudan remains one of the poorest countries in the world, heavily relying on oil exports while lacking diverse industries and stable agricultural systems. Years of political instability, conflict, and economic hardship have weakened the country's ability to have consistent access to nutritious food. Among these challenges, one of the most urgent and preventable contributors is the severe and widespread flooding. Due to South Sudan's geography near Lake Victoria, water levels heavily affect and allow for recurring annual flooding patterns. These deadly floods destroy crops, making it nearly impossible for a family facing one to ever recover their farm. As the majority of the nation lives in a rural environment and heavily relies on subsistence agriculture for survival, one flood could destroy a family's livelihood, leaving them with no way to continue supporting themselves. To improve food security in South Sudan, reinforced flood embankments should be constructed in flood-prone communities in Jonglei State. By constructing these embankments through partnerships between local communities, humanitarian organizations, and government agencies, this approach can provide short-term employment and agricultural protection while creating long-term food security and reducing dependence on emergency aid.

The Challenge: Flooding & Malnutrition in Jonglei State

South Sudan is currently undergoing a period of severe crisis, experiencing one of the most difficult lean seasons in its history. Hunger rates are continuing to climb as flooding becomes more frequent, prolonged, and intense. Much of the country lies along the Nile River basin, consisting of flat plains and wetlands that are highly vulnerable to seasonal rains. Due to the country's low-lying geography, poor drainage systems, and lack of infrastructure, communities struggle to fully recover before the next flood strikes, creating a vicious and destructive cycle that intensifies food insecurity each year. According to the World Food Programme, "Extreme flooding has devastated livelihoods and destroyed crops across large parts of South Sudan" (WFP). This destruction is especially catastrophic in a country where more than 80% of the population lives in rural areas and relies on subsistence farming and livestock for survival. For example, consider a representative rural household in Jonglei State that depends on a combination of crop farming, livestock, fishing, and small-scale trade to meet its food and income needs. Commonly grown crops in the region include sorghum, groundnuts, maize, beans, and vegetables, while cattle, goats, and poultry are important sources of livelihood. When flooding destroys crops or disrupts access to livestock and markets, a household can lose both its food supply and its primary sources of income at the same time. When crops are washed away and animals drown, families lose both their immediate food supply and the seeds or animals needed for the next season. This merciless routine weakens local economies and disrupts national food supply chains, causing food shortages that reach into cities and other urban centers.

Rising food prices and shortages in grocery stores mean that many families will have nothing to put on the table. The effects are especially devastating for women and children,who are biologically and socially more vulnerable to malnutrition. Children who don't have access to enough nutritious food before the age of three have significantly increased chances of permanent growth defects and a significantly higher mortality rate. UNICEF (2026) warns that,"A malnourished child without treatment is 12 times more likely to die," illustrating how food insecurity has become a life or death situation for many people in South Sudan. Additionally, flooding creates a visible impact on the environment, contaminating water and contributing to the spread of disease. This environment paired with the limited access to aid and healthcare makes it extremely difficult for the people living in the country to survive. Given the scale and persistence of these challenges, meaningful and sustainable solutions must be implemented to move the country toward greater long-term stability and food security. Rather than attempting to solve flooding across the entire country at once, efforts should begin in particularly vulnerable communities in Jonglei State, where repeated flooding has severely disrupted agriculture and displaced residents. A localized approach would allow organizations to test, maintain, and improve flood protection infrastructure before expanding the program to the other vulnerable communities.

Evaluation of Past & Present Interventions

The issue of flooding in South Sudan has already been addressed through emergency food assistance and small-scale flood protection projects, so a completely new system is not necessary. Instead, existing humanitarian efforts should be expanded to include more preventative and locally managed infrastructure. Humanitarian organizations have distributed emergency food aid to prevent widespread starvation during severe flood seasons, helping millions of families survive immediate crises. For example, "The United Nations World Food Programme (WFP) is scaling up its emergency response to reach the growing number of people forced to flee spiralling conflict in South Sudan's Jonglei state." (WFP). These interventions are critical when roads become impassable and communities are physically isolated, and they have undoubtedly saved thousands of lives. Nevertheless, delivering emergency food is only a temporary solution because it does not rebuild farms or restore the crops lost. Additionally, this method cannot prevent any future floods from isolating communities again. While necessary in a crisis, this type of support is designed for short-term survival rather than long-term recovery and reconstruction. Moreover, small-scale flood protection, such as small dikes, sandbags, or flood barriers have been built in vulnerable communities. Despite protecting certain areas temporarily, these small projects are frequently overwhelmed by prolonged and intense rainfall. "We are pleased to announce that these interventions are working well, but we are also looking beyond quick-fix solutions that help refugees become more self-reliant and less dependent on humanitarian assistance in the long run," said UNHCR Representative Ahmed Warsame. This confirms that despite helping many families in South Sudan, humanitarian aid is not a sustainable and permanent solution. Furthermore, the scale of flooding has outpaced the scale of the solutions. This suggests that the most effective approach is not to replace humanitarian aid, but to shift some resources toward prevention. Emergency food assistance should remain available during severe floods, while investments in infrastructure can reduce the amount of assistance communities need in the future. This combination would address both immediate survival and long term recovery. Even though some protective measures were implemented, they were not strong enough to handle repeated and worsening floods. It suggests that limited funding and increasing climate severity have prevented these efforts from creating lasting stability. As a result, communities continue to face recurring damage despite past interventions. At the same time, ongoing conflict has made it harder for communities themselves to recover, as violence and instability continue to disrupt daily life and long-term progress. These experiences emphasize both the importance of humanitarian aid and the need to evaluate how future strategies can build upon past efforts to create more lasting and visible change.

Strategic Proposal: Implementation, Stakeholder Impact & Limitations of Adaptive Community Embankments

A more preventative and sustainable approach would involve constructing reinforced flood embankments in flood-prone communities in Jonglei State. Rather than using simple earth walls that can easily erode or wash away, the embankments could be stabilized with locally available materials such as rock-filled gabion baskets and bamboo matting, while vetiver grass could be planted along the embankments to help stabilize the soil and reduce erosion. Instead of trying to protect the entire country at once, the program could begin in several highly vulnerable communities and expand as funding and resources become available. By focusing on one infrastructure solution, the program would be easier to implement, maintain, and evaluate over time. Taking action before flooding occurs is important because once crops are lost, families often have no immediate way to recover their food supply or income. The program would be implemented through partnerships between community leaders, local workers, South Sudanese government agencies, and humanitarian organizations. Community leaders could help identify the areas most vulnerable to flooding, while local workers could be hired to construct and maintain the embankments. Humanitarian organizations and government agencies could provide technical expertise, equipment, and construction materials. This would not only strengthen infrastructure but also help households maintain a livable income during periods of environmental crisis. The expected impact is a reduction in crop loss, which could improve food security and lower hunger rates. When communities are able to protect their harvests, they are less likely to depend entirely on emergency aid after every flood. Some limitations of this approach include funding constraints, challenges in maintaining infrastructure in remote regions, and potential transportation and material shortages. Implementing this plan would require construction materials, technical training, equipment, and reliable funding. Initial funding could come from international humanitarian organizations and development programs, with contributions from the South Sudanese government when possible. Funding should prioritize projects identified by local communities so that resources are directed toward the areas experiencing the greatest flood-related damage. Each stakeholder would benefit differently from the program. Farmers would experience less crop loss and have a more reliable source of food and income. Local workers could participate through the World Food Programme's Food Assistance for Assets (FFA) or Cash-for-Work programs, receiving cash or food assistance in exchange for helping construct and maintain the embankments. Scheduling this work during the dry season would provide households with immediate income or food assistance before the next harvest, while also giving community members a direct role in protecting their own communities. This approach would build local support for the project while providing short-term hunger relief and valuable construction and maintenance skills. Community leaders would play a greater role in protecting their communities, while humanitarian organizations could redirect some resources from repeated emergency responses toward prevention and long-term community resilience. Government agencies would benefit from stronger local infrastructure and greater community resilience. Most importantly, women and children would benefit from more consistent access to food and reduced risks associated with severe malnutrition. A similar approach has been used in Bangladesh, a country that also faces severe and recurring flooding. Through its Coastal Embankment Improvement Project, Bangladesh has rehabilitated and upgraded flood embankments to protect low lying communities and agricultural land from flooding. The project has protected hundreds of thousands of people while supporting agricultural production and involving local water management groups in the operation and maintenance of the flood-protection systems. South Sudan could apply a similar approach in Jonglei State, but on a smaller and locally adapted scale that reflects the region's geography, resources, and community needs. This comparison demonstrates that investing in flood embankments can be part of a long-term strategy for protecting agricultural livelihoods rather than relying only on emergency relief. Policies that promote climate adaptation and disaster preparedness will help in the success of this project. In the short term, the program would provide employment, protect crops and stored food, and help communities maintain access to food during flood seasons. Making local communities part of the planning and construction process would also make the project more culturally appropriate. Instead of imposing an outside solution, community leaders

and farmers would help determine where embankments are needed and how they should be maintained. This would allow the project to reflect the needs and knowledge of the people who experience flooding firsthand. In the long term, maintaining this infrastructure could reduce repeated agricultural losses, strengthen local economies, and decrease communities' dependence on emergency food assistance. Although funding and maintenance would remain challenges, beginning with smaller community-based projects would make the recommendation more feasible and allow successful strategies to be expanded gradually. This recommendation is fairly sustainable because it builds local capacity and protects food systems, making it a feasible long-term response to food insecurity caused by flooding.

Conclusion: Building Long-Term Food Security and Community Resilience

Ultimately, constructing reinforced flood embankments in vulnerable communities in Jonglei State offers a realistic path toward breaking the cycle of hunger and malnutrition caused by flooding in South Sudan. When harvests are more secure, families are better able to plan for the future rather than constantly recovering from setbacks. The project also supports local employment, providing means of community cooperation and economic opportunity for those involved. Improved flood management would help stabilize food supply chains and lessen dependence on international emergency aid over time. Fewer families would face extreme malnutrition, and children would have a greater chance of healthy development. Although no single solution can eliminate all risks, investing in long-term resilience provides a stronger foundation than relying solely on temporary relief efforts. Beginning with a limited number of communities would make the project more feasible financially and allow local leaders and organizations to evaluate what works before expanding the program. In the short term, families would benefit from protected crops and employment opportunities. Over time, stronger agricultural systems could improve local economies, reduce dependence on emergency aid, and create greater resilience against future flooding. Overall, investing in flood protection infrastructure can help create safer, more food-secure communities and reduce the cycle of hunger caused by flooding.

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