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REVALUATING WHOLE MEASURES OF COMMUNITY FOOD SECURITY IN UNITY STATE, SOUTH SUDAN

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Abstract

Conflict in the newly formed South Sudan has had devastating effects on the nation's food security. Many food security metrics overlook factors of agriculture, such as seasonality, access to agricultural inputs; or the effects of displacement of small farm holders due to conflict. In light of these complexities, constructs were adapted from Whole Measures for Community Food Systems (WMCFS), and evaluated for their appropriateness in articulating the food situation in Unity State, South Sudan. This study used a pilot study approach, triangulating publicly available, qualitative and quantitative datasets from the Famine Early Warning System Network, United Nations, Government of South Sudan, humanitarian workers, and social media. Data were coded for relevance to metrics using Atlas.ti software, and scored based on WMCFS. In all, the WMCFS pilot showed the promise of a participatory planning process to secure lasting community food security, and focus on long-term agricultural development rather than food aid.

Keywords: South Sudan, Community Food Security, Whole Measures, Agricultural Development

Introduction

South Sudan is the world's youngest nation and has a population of nearly 10 million people. It covers an estimated area of 640,000 square kilometers according to the New Sudan Centre for Statistics and Evaluation (NSCSE) survey of 2004. South Sudan gained independence from Sudan in 2011 with the hope that the people of South Sudan would enjoy the freedoms that were denied them when they were with Sudan (Solyga, 2015). Unfortunately, a civil war erupted between various factions of the new government based on ethnic affiliations. South Sudan has the potential to be an agricultural producing nation as it has rich soil and adequate rainfall. Currently, subsistence agriculture is the most important source of employment, income generation, and revenue for all the people who live in the countryside. However, the subsistence form of agriculture is expected to grow into commercial agriculture in the near future (Odero, 2006). Sorghum and maize (corn) are the key cereals grown in South Sudan. Other crops include groundnut (peanut), cassava, yam, and potatoes. The country also has a large population of livestock and several fishing sites (Odero, 2006).

Despite the rich soil and adequate rainfall, South Sudan is unable to feed its population and guarantee food security following several years of armed conflict, corruption, lawlessness, and random killings in many places in the country (Solyga, 2015; World Bank, 2015). Food security is generally known as a situation of secure, sufficient, and suitable supply of adequate food to everyone in the household at all times (Policy Brief, 2006). There is no doubt that the population in the conflict zones, particularly, in Unity and Upper Nile states of South Sudan bear the burden of food insecurity vulnerabilities, because the long drawn-out unrest has weakened their resiliency (see Appendix for Map of South Sudan). The war has caused vulnerability, hopelessness, and depleted citizens' assets to the zero level (Solyga, 2015).

The coping strategies of conflict and food insecurity include consumption of wild foods, too much gathering of firewood for sale, and skipping meals. The Integrated Food Security Phase Classification (IPC) reported that a majority of the households in the conflict-affected states such as Unity State are relying heavily on incomes derived from wild fruits, roots, firewood, and livestock sales (IPC, 2014). In addition, South Sudanese who are living in the Northern states are highly dependent on the food aid for survival (Lokosang et al., 2016). According to IPC, the people of Unity State have the highest record of dependency on livestock incomes before and during the war. Similarly, the IPC report revealed that some communities and households in Unity State are entirely dependent on humanitarian assistance for everything, from food and water to clothing and medical needs (IPC, 2014).

Besides the conflict, small farmers who are relying on subsistence agriculture are defenseless against environmental degradation and climate change (Solyga, 2015). In fact, in many parts sub-Saharan Africa, the depletion of soil fertility and climate variability has been weakening crop yields (Jones and Thornton, 2003). The lack of economic resources for subsistence farmers in Unity State, for example, hampers their ability to access an alternative source of revenues (Slingo et al., 2005). Furthermore, the growing population is creating other serious problems such as deterioration of agriculture, wildlife extinction, and land use pressures (Sanchez and Swaminathan, 2005).

Studies have shown that multiple shocks and stresses are currently affecting the people of Unity State in South Sudan and trigger food insecurity. These shocks and stresses that make the roads to recovery more difficult, include climate variations, political instability, low agricultural productivity, lack of infrastructures, lack of education, limited access to healthcare, and inadequate access to water and sanitation (Ahemed and Guarneri, 2015). To achieve stability, strengthen food security, and launch development in South Sudan, an immediate end to the conflict is needed, followed by rule of law that protects all citizens' lives and property.

In addition, to promoting stability and food security in Unity State, a more sustainable management of natural resources is required in order to improve the living conditions (Solyga, 2015). To reverse vulnerability to food insecurity in Unity State, agricultural training and development should be promoted. Moreover, insecurity, education, healthcare, and general infrastructure issues need to be addressed and implemented for the South Sudanese people to have sustainable and productive lives. The purpose of this study, therefore, is to pilot test Abi-Nader et al. (2009) Whole Measures for Community Food Systems in Unity State, to preliminarily evaluate the appropriateness of this novel approach to food security assessment in an area of conflict and environmental vulnerability.

Effects of the Conflict on Food Security in South Sudan

Political Instability

The conflict that started in mid-December 2013 has caused severe food insecurity in South Sudan (IPC, 2015). It has been threatening to the country's progress toward food security, and the violence is on the brink of impacting other parts of South Sudan where the war has not reached. The crisis has caused massive displacement of the civilian population, loss of food stocks, damaged property, disrupted businesses, and has created unsafe migration routes to neighboring countries (Breisinger et al., 2014; World Food Programme, 2014). The ongoing

insecurity is affecting the transportation of food to various parts of the country (Breisinger et al., 2014).

High Food Prices

The insecurity and tension have created irregular migration of livestock to grazing areas, restricted market functionality, and caused high food prices (IPC, 2015). Food prices in the affected regions are increasing rapidly as direct consequences of inadequate market activity and reduced trade flows. The price increases have resulted from more road checkpoints (and perhaps, more bribes), curfews and vehicle restrictions in certain areas, high transportation costs because of high fuel prices, and fear of traders to even show up at markets (Breisinger et al., 2014). At the same time, imported food has not been making its way to rural areas because of restrictions on movement and rising transportation costs. For example, in Juba, the capital of South Sudan, the prices of locally produced and imported cereals, vegetable oil, and sugar have been rising above the normal prices. Furthermore, the conflict has raised inflation and decreased the value of the local currency. Consequently, the depreciation of local currency has resulted in a diminution of purchasing power, reduction of household stocks, and a high cost of living (IPC, 2015).

Low Agricultural Productivity

The insecurity has been affecting the planting seasons (World Food Programme, 2014). The threat of attack from the government in Unity State has disrupted agricultural activities, because some farmers are afraid of planting their crops. Others have completely abandoned their land and fled the violence (Breisinger et al., 2014). Those who remain must cope with a decreasing supply of farm labor and reduced access to fertilizer, seeds, fuel, and irrigation water; thus, resulting in low agricultural productivity.

Measures of Food Security

Measures of food security in areas of conflict often fail to address long-term agricultural development goals that can lead to lasting peace and long-term, community-level food security. They usually focus more on food aid (Hamm and Bellows, 2003). Whole Measures for Community Food Systems (WMCFS) (Abi-Nader et al., 2009) is an assessment toolkit that describes and plans improvement of local agrifood systems through participatory processes. It uses value-based decision-making with a diverse array of community members. Instead of simply looking at food supply like other food security measures, it acknowledges that a variety of factors come together to impact the agrifood system in complex ways, including justice and fairness, strong communities, vibrant farms, healthy people, sustainable ecosystems, and thriving local economies.

This study seeks to develop a new way of thinking about food security assessment in areas of conflict, which will lead to long-term agricultural development rather than focusing on food aid alone. To that end, the authors' objective is to pilot test WMCFS in South Sudan's Unity State, being that it is a key center of the conflict.

Methodology

Whole Measures for Community Food Systems

WMCFS was utilized, because it gives local communities the flexibility to engage in sustainable agricultural development using shared goals. Abi-Nader et al. (2009, p. 7) described WMCFS as a values-based planning and evaluation process created to encourage communities and

organizations to work together to promote food production and a healthy environment. WMCFS helps the community build up local wealth, foster social justice, fairness and make local food production stronger. It also gives institutions the flexibility to look beyond their defined mission and think critically about a strong and wholesome community. A strong society encourages impartiality in food distribution systems and reacts to food needs accordingly. WMCFS enables individuals and organizations to build up collaborative associations, confidence, and reciprocity. It inspires equal participation in community activities, political empowerment, and local leadership development. Thus, WMCFS assists individuals and organizations to develop shared visions and common expectations (Abi-Nader et al., 2009). Above all, WMCFS supports environmental sustainability that can boost the local economy.

Data Collection and Analysis

In order to evaluate the applicability of the community food security evaluation toolkit, WMCFS (Abi-Nader et al., 2009) was used to assess the food security situation in Unity State. Using a multi-step approach, the authors collected and analyzed data from August to December of 2015. The steps used in the data collection and analyses are described below:

1. Gather all qualitative and quantitative data compiled by individuals in Unity State in the past year and is available in English. Save and organize these data.
2. As a team, work through as much of the WMCFS toolkit as possible, given location constraints.
3. Carefully examine each of the Whole Measures. As a team, based on knowledge of Unity State determine inclusion or exclusion, and/or modify the measures to fit current conditions in Unity State. Record rationale.
4. Scan and rank qualitative and quantitative data for their potential to address criteria developed from the Whole Measures. Select highest priority datasets for further examination.
 - a. Qualitative data were from the International Office of Migration, Famine Early Warning System, International Rescue Committee, African Arguments, the Human Security Baseline Assessment, and Twitter feed (#SouthSudan, #Unity, #Bentiu).
 - b. Quantitative data were from a database of the World Food Program, Food and Agriculture Organization, South Sudan Ministry of Agriculture and Human Rights organizations.
5. Develop a coding scheme for qualitative data based on Whole Measures. Code data using Atlas.ti software to assess each Whole Measure based on descriptive quantitative data points.
6. Combine qualitative and quantitative results in a matrix that includes each evaluation criterion derived from Whole Measures.
7. Rate information on each criterion according to the toolkit's instructions. Synthesize and summarize the food security situation in Unity State based on ratings.
8. Develop an assessment of the appropriateness of Whole Measures through reflexive discussion.

Limitations of Data

Since this research is an experimental pilot study, it has limitations. South Sudan remains a country at war, which prohibits travel for direct data collection. Thus, data collection had to be second-hand, and it is extremely hard to find current information on Unity State. While every effort was made to verify the data through cross-examination, reporting errors may have occurred. However, the authors believe that by testing this new approach to evaluating community food security in this area of conflict, they would demonstrate the merit of long-term community approaches to food security, even in times of war. Nonetheless, they believe that a multi-faceted approach is needed for the agricultural development of South Sudan, after it finally achieves its long-awaited peace.

Findings

Although WMCFS is normally presented as a unitary Table in six dimensions, in this study, the findings are presented in six separate tables, for simplicity. The dimensions are as follows: a food system that is just and fair; a food system that builds strong and resilient communities; a food system that promotes health, vibrant farms; a food system that promotes healthy people; a food system that supports sustainable ecosystems; a food system that promotes thriving local communities. The weight total of category scores per row and column ranges from a negative value to 0 through 5, where 0 means no delivery of services to people and 5 provides the highest favorable services to people. A negative value means the situation is dire or acute. The findings indicate that, ideally, WMCFS can be used to promote social justice and fairness in the distribution of food among all South Sudanese communities in Unity State, regardless of their tribe or religion. Equal distribution of food among different communities can lead to peaceful co-existence of these communities. Healthy neighborhoods can foster sustainable family farms and protect farm workers. The detailed results are subsequently described in turn.

Table 1a describes a food system that is just and fair. It has four components. The first component is “provides food for all.” This component allows community members to have access to fresh, healthy, affordable, and culturally appropriate food. However, people in Unity State lack access to fresh and culturally appropriate food. The score of -3 means that acute malnutrition is rampant, and humanitarian organizations are not able to satisfy the need for nutritious food. Tens of thousands are in the worst stages of food insecurity. Markets are not functioning, and the number of people that seek food has risen.

The second component “reveals challenges and dismantles injustice in the food system.” This criterion upholds the dignity, grazing rights, sanctity of place, and quality of life for all who work in the food system. The score of -3 means that farmers and herders have been displaced, and also, government military forces have stolen cattle.

The third component “creates just food system structures and cares for food system workers.” This component ensures safe farming conditions, without discrimination for those who farm crops or herd cattle. The score of -3 means oil extraction and conflict have led to widespread safety issues, leading to death and displacement of farmers and herders in Unity State. The vast majority of the displaced population is from the Nuer ethnic group. Also, violence towards women has been increasing.

The fourth component “ensures that public institutions and local businesses support a just community food system.” Public institutions (e.g., schools and refugee camps) serve culturally appropriate food to all. The score of 3 means that humanitarian organizations are providing what appears to be culturally appropriate food, but by displacing agrarian people, food traditions are not allowed to be expressed.

Table 1a. A Food System that is Just and Fair

Criterion	South Sudan Operationalization (reflecting modification by authors)	Quantitative Summary of Evidence	Quantitative Final Score
1. Provides food for all	Ensures access for all community members to fresh, healthy, affordable, and culturally appropriate food.	Acute malnutrition is rampant. Humanitarian organizations in Unity are not able to fill the demand for food. Tens of thousands are in the worst stages of food insecurity according to several measures. Market structures are not functioning.	-3
2. Reveals, challenges, and dismantles injustice in the food system	Upholds the dignity, grazing rights, sanctity of place, and quality of life for all who work in the food system.	Farmers/herders have been displaced. Cattle have been stolen by government military forces.	-3
3. Creates just food system structures and cares for food system workers	Ensures safe farming conditions, without discrimination for those who farm/herd.	Oil extraction and conflict have both led to widespread safety issues, leading to death and displacement of farmers/herders in Unity, most of whom are of Nuer ethnic group.	-3
4. Ensures that public institutions and local businesses support a just community food system	Ensures that public institutions (schools, refugee camps) serve culturally appropriate food to all.	Humanitarian organizations are providing what appears to be culturally appropriate food, but by displacing agrarian people, food traditions are not allowed to be expressed.	3

Table 1b describes a food system that builds strong and resilient communities. It also has four components. The first component is “improves equity and responds to community food needs.”

Table 1b. A Food System that Builds Strong and Resilient Communities

Criterion	South Sudan Operationalization (reflecting modification by authors)	Quantitative Summary of Evidence	Quantitative Final Score
1. Improves equity and responds to community food needs	Involves a broad range of community leaders from all ethnic groups, in defining supporting food related goals	Due to dislocation and targeting civilians in war, the community is uninvolved in food-related goals. The local community is also uninvolved in decisions regarding oil production in their homelands. The Bentiu Protection of Civilians (POC), however, is involving community leaders in camp management decisions.	0
2. Contributes to healthy neighborhoods	Balances community food goals with safety, housing, transportation, and social goals.	Support structures balance emphasis between food, housing, transportation and other social goals. Community groups within Bentiu’s humanitarian camp, for example, have been organizing interfaith groups, psychosocial support, drama groups, and sports competitions. The humanitarian groups have also been providing shelter and working to improve road and barge access.	5
3. Builds diverse and collaborative relationships, trust, and reciprocity	Cultivates a learning community among farmers/herders to learn from each other alongside agricultural extension, ag/food service providers,	The agrarian people of Unity (Nuer) have established foodway traditions that share knowledge between farmers/herders and for the next generation. Training programs have been conducted with community	5

	and aid workers.	leaders and humanitarian aid organizations at United Nations's Bentiu POC site, for psychosocial support, hygiene, and how to utilize short season vegetable seedstocks.	
4. Supports civic participation, political empowerment, and local leadership	Includes and improves access to local government agencies that can support the stability of local/regional food infrastructures according to the community's interests.	The government in Bentiu has been relocated for safety, lessening access. Journalists have been targeted, jailed, killed. Humanitarian workers have been deported for criticizing the government (e.g., Toby Lanzer, U.N.). Widespread nepotism in the government. Peace talks are immediately followed by violence leading to decreased approval of affected communities. Overall, very poor government access.	-3

The approach allows a broad range of community leaders from all ethnic groups to define and support food-related goals. The score of 0 means that local communities are not involved in food-related goals and decision making. For example, communities situated in oil fields do not take part in decision making regarding oil production.

The second component “contributes to healthy neighborhoods.” This component means that food system balances community food goals with safety, housing, transportation, and social goals. The score of 5 means that support structures balance the relationships among food, housing, transportation and other social goals. Community groups within the Bentiu humanitarian camp, for example, have been organizing interfaith groups, psychosocial support, drama groups, and sports competitions. In addition, the humanitarian groups have been providing shelter and working to improve road and barge access

The third component “builds diverse and collaborative relationships, trust, and reciprocity.” This component gives community flexibility to cultivate a learning community among farmers or herders to learn from each other alongside agricultural extension, agriculture and food service providers, and aid workers. The score of 5 means the agrarian people of Unity State (i.e., the Nuer) have established foodway traditions that share knowledge between farmers and herders and for the next generation. In addition, the aid organizations have conducted training programs for community leaders at the United Nations’s Bentiu Protection of Civilians (POC) site,

focusing on psychosocial support, appropriate hygiene techniques, and how to utilize short season vegetable seed stocks.

The fourth component is “supports civic participation, political empowerment, and local leadership.” This criterion improves access to local government agencies that can support the stability of local and regional food infrastructures according to the community’s interests. The score of -3 means the government in Bentiu has been relocated for safety, lessening access. Journalists have been targeted, jailed, and killed. Humanitarian workers have been deported for criticizing the government (e.g., Toby Lanzer, U.N.). There is widespread nepotism in the government. Also, peace talks are immediately followed by violence on “disadvantaged communities” leading to their disapproval of the terms and process. Overall, the access to government is very poor, especially in affected areas.

Table 1c depicts a food system that promotes healthy, vibrant farms. It comprises three components. The first component “supports local, sustainable family farms to thrive and be economically viable.” This component allows communities to build capacity for farmers in traditional and sustainable farming practices that nourish the land and natural resources. The score of -3 implies no impacts of official agricultural policy. Government military offensive on civilians has resulted in severe negative impacts on farmer capacity through displacement and asset reduction (e.g., diminished seed stocks and livestock). Government military activity has also impeded humanitarian access to civilians in Unity State.

The second component “protects and cares for farmers and farm-workers.” This criterion implies fair wages and safe working conditions that limit and eliminate exposures to hazards and violence for all farmers without discrimination. The score 0 implies fair and safe working conditions do not exist in Unity State, due to violent conflict and cattle raids. The target of these raids has been members of the Nuer ethnic group.

The third component is “respects farm animals.” This component means that agricultural extension and agricultural food service providers must support the traditional herder’s way of life. The score 3 implies that no agricultural service providers are working in Unity, but humanitarian organizations are conducting air-drops of short-season vegetable seeds, which involves brief tutorials on how to plant these seeds.

Table 1d depicts a food system that promotes healthy people. This goal also has three components. The first component “provides healthy food for all.” It utilizes a broad range of public investments and tools, such as land use planning, to increase access to healthy food. The score 3 implies that land access traditions had ensured food access for generations. However, since the conflict broke out, public investment has had no positive impact on Unity State. Community groups within humanitarian camps are working to improve the camps.

The second component “ensures the health and well-being of all people, inclusive of race and class.” This criterion provides deep understanding of the interrelationships between food security, and inequities across race, ethnicity, gender, class, and health outcomes. The score of -3 implies violence towards women is common and has worsened with the conflict. Ethnic groups, mainly, the Nuer, have been targeted by the government’s military. Entire villages have been

destroyed and serious war crimes committed, leading to poorer health outcomes due to acute malnutrition, and other diseases.

Table 1c. A Food System that Promotes Health, Vibrant Farms

Criterion	South Sudan Operationalization (reflecting modification by authors)	Quantitative Summary of Evidence	Quantitative Final Score
1. Supports local, sustainable family farms to thrive and be economically viable	Builds capacity for farmers in traditional and sustainable farming practices that nourish the land and natural resources.	No impacts of official agricultural policy. Government military offensive on civilians has resulted in severe negative impacts on farmer capacity through displacement and asset reduction (diminished seed stocks, livestock). Government military activity has also impeded humanitarian access to Unity State.	-3
2. Protects and cares for farmers and farm-workers	Ensures fair wages and safe working conditions that limit and eliminate exposures to hazards and violence for all farmers without discrimination.	Due to violent conflict and cattle raids, fair and safe working conditions do not exist in Unity, and ethnic groups (especially, the Nuer) have been targeted.	0
3. Respects farm animals	Ensures the traditional herder way of life, supported by agricultural extension and ag/food service providers.	No agricultural service providers are working in Unity, but humanitarian organizations are conducting air-drops of short-season vegetable seeds, which involves brief tutorials on how to plant these seeds.	3

The third component “connects people and land to promote health and wellness.” This component allows community members to provide safe settings and opportunities for people to directly experience the land, free from violence. The score of -3 implies agrarian people of Unity

State are in hiding from government military forces within non-agricultural wetlands, under constant threat of ethnically-motivated violence.

Table 1d. A Food System that promotes Healthy People

Criterion	South Sudan Operationalization (reflecting modification by authors)	Quantitative Summary of Evidence	Quantitative Final Score
1. Provides healthy food for all	Utilizes a broad range of public investments and tools (such as land use planning) to increase access to healthy food.	Land access traditions ensured food access for generations. Since conflict, public investment has not had a positive impact on Unity. However, community groups within humanitarian camps are working to improve the camps. Aid organizations are at work in Unity.	3
2. Ensures the health and well-being of all people, inclusive of race and class	Deepens understanding of the interrelationships between food security, inequities across race, ethnicity, gender, and class, and health outcomes.	Violence towards women is common and has worsened with conflict. Ethnic groups, mainly, Nuer, have been targeted by government military. Entire villages destroyed and serious war crimes committed, leading to poorer health outcomes due to acute malnutrition and other diseases for ethnic groups in Unity.	-3
3. Connects people and land to promote health and wellness	Provides safe settings and opportunities for people to directly experience the land, free from violence.	Agrarian peoples of Unity are in hiding from government military forces within non-agricultural wetlands, under constant threat of ethnically-motivated violence.	-3

Table 1e presents a food system that supports sustainable ecosystems. This set comprises three components. The first component “sustains and grows a healthy environment.” This entails protecting and improving soil, water, air, energy, and seed quality and quantity for long-term needs. The score of 5 means traditional agricultural practices do protect and improve natural resources, but official government policy does not recognize the significance of protecting these

resources, as evidenced by poor oil extraction practices and emphasis on increasing international trade.

The second component “promotes an ecological ethic.” This component permits the community to value ecosystem elements and understand their function in producing food and supporting life. The score of 5 means the agrarian Nuer people of Unity State have a good understanding of how ecosystem functioning contributes to food production. Conversely, government activities show little or no value on ecosystem contributions, as evidenced by poor oil extraction practices.

The third component “promotes agricultural and food distribution practices that mitigate climate change.” This criterion reduces reliance on fossil fuels and utilizes renewable energy sources in food production and distribution. The score of 3 means that, overall, the people of Unity State are less reliant on fossil fuels for their livelihood than on food production. Since independence, the government policy has been geared toward increasing international trade, for example, increasing imports of food and exporting oil. Also, energy policy did not positively impact Unity State.

Table 1e. A Food Systems that Supports Sustainable Ecosystems

Criterion	South Sudan Operationalization (reflecting modification by authors)	Quantitative Summary of Evidence	Quantitative Final Score
1. Sustains and grows a healthy environment	Protects and improves soil, water, air, energy, and seed quality and quantity for long-term needs.	While traditional agricultural practices do protect and improve natural resources, official government policy does not recognize the significance of protecting these resources, as evidenced by poor oil extraction practices and emphasis on increasing international trade.	5
2. Promotes an ecological ethic	Values ecosystem elements and understands their function in producing food and supporting life (foodshed).	The agrarian people of Unity (the Nuer) have a good understanding of how ecosystem functioning contributes to food production, but government activities show little or no value on ecosystem contributions, as evidenced by poor oil extraction practices.	5

3. Promotes agricultural and food distribution practices that mitigate climate change	Reduces reliance on fossil fuels and utilizes renewable energy sources in food production and distribution.	The people of Unity are overall less reliant on fossil fuels for their livelihoods. Since independence, the policy has been geared toward increasing international trade, for example, increasing imports of food and exporting oil. No renewable energy policy impacts felt in Unity State.	3
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Table 1f presents a food system that promotes thriving local economies. Again, this set comprises three components. The first component “creates local jobs and builds long-term economic vitality within the food system.” This criterion allows farmers to invest, and encourages and promotes community-based enterprise development. The score of -3 means that financial and political capital invested in oil extraction before the war may have likely peaked. In fact, most of the funds borrowed prior to the conflict, went for consumption needs rather than capacity building. Moreover, the war has led to the destruction of infrastructure.

The second component “builds local wealth.” This component promotes local and regional agricultural businesses that are sustainable, and supports a healthy food system. The score of 0 means that there was no known local business promotion programs in Unity State. As a result of the conflict, imports have diminished due to currency depreciation.

The third component “includes infrastructure that supports community and environmental health.” This criterion allows development of new enterprises and products that respect ecological diversity and conserve resources for future generations. The score of 0 means that the government depends largely on oil, but oil has likely already peaked. There has been low foreign investment due to the war. Overall, there has been little to no impact of policy on the development of economic activity in Unity State.

Table 1f. A Food System that Promotes Thriving Local Economies

Criterion	South Sudan Operationalization (reflecting modification by authors)	Quantitative Summary of Evidence	Quantitative Final Score
1. Creates local jobs and builds long-term economic vitality within the food system	Invests, encourages, and promotes community-based enterprise development.	The financial and political capital was invested in oil extraction before the war, but oil this has likely peaked. Most funds borrowed prior to the conflict, went for consumption needs rather than capacity building.	-3

		Government military offensive has destroyed infrastructures needed for businesses.	
2. Builds local wealth	Promotes local and regional agricultural businesses that are sustainable and support a healthy food system.	No known local business promotion programs at work in Unity. Imports have diminished due to currency depreciation. Local production would be helpful; since prices of imported foods have risen.	0
3. Includes infrastructure that supports community and environmental health	Develops new enterprises and products that respect ecological diversity and conserve resources for future generations	The government depends largely on oil; investment in oil has likely peaked. Low foreign investment due to war. Currency depreciation persists. Overall, little to no impacts of policy to develop economic activity in Unity.	0

Overall, the Whole Measures align well with the situation in Unity State, South Sudan. Of the six dimensions, the best rating (based on the summation of the quantitative final score in each dimension) was for: “a food system that supports sustainable ecosystems (high positive)”; followed by “a food system that builds strong and resilient communities (fairly high positive)”; “a food system that promotes health, vibrant farms (neutral/zero)”; “a food system that promotes healthy people (negative)”; “a food system that promotes thriving local communities (negative)”; and “a food system that is just and fair (high negative).” This means traditional systems support or local people understand ecosystems well, and also, humanitarian organizations are helping to build hope and resiliency in the people. Nonetheless, all the dimensions need improvement, but more so the latter four dimensions.

The Whole Measures can be used to highlight a path to greater community food security. The World Food Programme (2015) defined food security as an accessibility of safe, adequate and nutritious food, at all times to sustain the body’s health and active life. The utilization of the Whole Measures could enable South Sudanese communities in Unity State to gain access to a safe and culturally suitable food. Community food security would enable diverse local communities to work together to construct durable food production systems and revitalize the local economy.

Discussion

The study assessed the appropriateness of a new tool, the Whole Measures for Community Food Systems (WMCFS) (Abi-Nader et al., 2009) to evaluate the community food security situation in

Unity State, South Sudan. Utilization of the Whole Measures for Unity State yielded some interesting insights:

First, the goal was to pilot test the aforementioned approach using, Unity State as a test case. The researchers succeeded, through the multi-step approach, in obtaining fairly good results. This suggests that the pilot assessment was a good start to a full assessment.

Second, the Whole Measures suggest customizing the criteria for each locale. It is feasible to adapt the metrics to Unity State, but participation by its at-risk populations will be needed to truly capture a more comprehensive outcome.

Third, by utilizing the WMCFS, the researchers highlighted several of the less-examined nuances of the current community food insecurity in Unity State, including land access challenges, oil infrastructure, and depleted seed stock, and livestock resources.

Fourth, the Whole Measures are helpful in underscoring the need to end the conflict and focus on long-term agricultural development for greater community food security, rather than just providing food aid. Currently, food security is highly volatile, or at best shaky.

Conclusion

It is said by many nongovernmental professionals that “what is measured gets done.” Thus, the authors believe that using a wider array of criteria to measure agrifood systems, such as was done in the study, is necessary to ensure that efforts are spent on measures or activities that will truly have positive impacts on food security. By testing this new approach to evaluating community food security in areas of conflict, the authors also demonstrated the merit of long-term participatory evaluative thinking, even in times of crisis. Consequently, the authors are of the view that a multi-faceted, participatory assessment is needed to plan for ultimate community food security in South Sudan. With appropriate long-term evaluative thinking, the agrifood system may be repaired in Unity State, and become a vital part of creating a lasting peace in South Sudan.

Appendix



Figure 1. Political Map of South Sudan Showing Various States and their Capitals, Including Unity State

Source: <http://www.mapsofworld.com/south-sudan/map.html>

References

- Abi-Nader, J., A. Ayson, K. Harris, H. Herrera, D. Eddins, D. Habib, and L. Villanueva. (2009). "Whole Measures for Community Food Systems: Values-Based Planning and Evaluation." <http://foodsecurity.org/pub/WholeMeasuresCFS-web.pdf> [Retrieved September 24, 2015].
- Ahemed, S, and V. Guarnieri. (2015). "Food and Agriculture Organization (FAO) of United Nations and World Food Programme (WFP) Crop and Food Security Assessment Mission to South Sudan." http://documents.wfp.org/stellent/groups/public/documents/ena/wfp274705.pdf?_ga=1.210868755.763858885.1481521402 [Retrieved January 10, 2017].
- Breisinger, C., O. Ecker, and J.F. Trinh Tan. (2014). "Conflict and Food Security." https://www.ifpri.org/sites/default/files/gfpr/2015/feature_3086.html [Retrieved March 24, 2016].

- Hamm, M.W, and A.C. Bellows. (2003). "Community Food Security and Nutrition Educators." *Journal of Nutrition Education and Behavior* 35 (1): 37-43.
- Integrated Food Security Phase Classification [IPC]. (2015). "May 2015 Food Security and Nutrition Analysis – Key messages." http://www.ipcinfo.org/fileadmin/user_upload/ipcinfo/docs/IPC_South%20Sudan_April2015_Communication%20Summary.pdf [Retrieved March 30, 2016].
- Integrated Food Security Phase Classification [IPC]. (2014). "The Republic of South Sudan Updated IPC Report December 2014." <http://reliefweb.int/sites/reliefweb.int/files/resources/IPC%20South%20Sudan%20-%20Dec%202014%20-%20Detailed%20Report.pdf> [Retrieved June 9, 2016].
- Jones, P.G., and P.K. Thornton. (2003). "The Potential Impacts of Climate Change on Maize Production in Africa and Latin America in 2055." *Global Environmental Chang*, 13: 51–59.
- Lokosang, L.B., S. Ramroop, and T. Zewotir. (2016). "The Effect of Weakened Resilience on Food Insecurity in Protracted Crisis: The Case of South Sudan." *Journal of Agriculture and Food Security* doi: 10.1186/s40066-016-0051-y.
- Maps of World. (2006). "Political Map of South Sudan." <http://www.mapsofworld.com/south-sudan/map.html> [Retrieved April 3, 2017].
- New Sudan Centre for Statistics and Evaluation [NSCSE]. (2004). "Towards a Baseline: Best Estimates of Social Indicators for Southern Sudan." <http://static1.1.sqspcdn.com/static/f/750842/9914019/1292955460577/Towards-Baseline.pdf?token=oq5VkJDczNVNszmB6vZwNfzsf8gA%3D> [Retrieved March 21, 2016].
- Odero, A.N. (2006). "Livelihood Characterisation of South Sudan: The use of Physiographic and Agro-Climatic Layers." http://www.fao.org/fileadmin/user_upload/fsn/docs/Microsoft%20Word%20-%20Andrew%20Odero_ESRI%20User_Paper.pdf [Retrieved March 21, 2016].
- Policy Brief. (2006). "Food Security." <http://www.fao.org/forestry/13128-0e6f36f27e0091055bec28ebe830f46b3.pdf> [Retrieved March 23, 2016].
- Sanchez, P.A and M.S. Swaminathan. (2005). "Hunger in Africa: The Link between Unhealthy People and Unhealthy Soils." *The Lancet* 365 (9457): 442-4 44.
- Slingo, J. M., A. J.Challinor, B.J.Hoskins, and T. R. Wheeler. (2005). "Introduction: Food Crops in a Changing Climate." *Philosophical Transactions of the Royal Society Biological Sciences* 360: 1983-1989.
- Solyga, A. (2015). "Food Security and Development of Agricultural Markets." <https://www.giz.de/en/worldwide/20515.html> [Retrieved March 16, 2016].
- World Bank. (2015). "Working for a World Free of Poverty." <http://www.worldbank.org/en/country/southsudan/overview> [Retrieved March 22, 2016].
- World Food Programme. (2015). "Food Security Analysis." <http://www.wfp.org/food-security> [Retrieved September 21, 2015].
- World Food Programme. (2014). "South Sudan Conflict Reverses Progress On Food Security." <https://www.wfp.org/news/news-release/south-sudan-conflict-reverses-progress-food-security> [Retrieved March 30, 2016].