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Livelihood resilience and adaptation to climate variability in post-conflict South Sudan-A review

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ABSTRACT

In post-conflict South Sudan, as in many other places, climate variability extreme events are already undermining communities' livelihoods by causing adverse socioeconomic and environmental impacts. However, few studies have paid little attention to the extent to which climatic shocks have disturbed the community's livelihood and resilience strategies built by communities. Quantitative methodological review using a systematic protocol to select scientific literature was employed. A total of twenty-five articles were extracted and analyzed. The findings indicated that climatic shocks such as flood, drought, have resulted in disruptive changes in cropping pattern, reduction in the crop production, erosion of social assets, exacerbate resource-based conflicts, resulting in large losses of livestock and disturbed the physical topography of the area leading to extinction of flora and fauna that constituted the livelihoods of the communities. Results also showed that: (1) crop farming and livestock rearing, (2) diversification of livelihood assets and, (3) switching to alternative off-farm businesses are pursued by households. This review paper recommends that policymakers should focus on building livelihood assets and investing in and outside the agriculture sector in order to promote sustainable livelihoods development and income diversification while providing pathways for communities to recover and adapt to climate variability.

Key words: Adaptation, Climate variability, Livelihood, Post-Conflict, Resilience, South Sudan.

South Sudan is one of the Sub-Saharan-Africa Country which is highly prone and vulnerable to climate variability shocks as reported in Climate scenarios produced by the intergovernmental panel on climate change (IPCC, 2011). According to the Global Climate risk Vulnerability Index 2015 (Sönke *et al*., 2015), South Sudan is ranked amongst the five worst performing countries in the world alongside the Democratic Republic of Congo, Central African Republic, Haiti, and Liberia. The Inter-governmental Panel on Climate Change (IPCC, 2007) projections indicate that South Sudan warming average will be felt 2 ½ times more than the global average by 2050. Climate variability impacts and conflicts affect the livelihood of communities every year, these events unleash considerable misery by destroying livelihoods and causing huge and often irreversible damage to the economic, social and cultural fabric of communities. Human and economic losses are set to increase in the near future as climate variability impacts such as changes in precipitation, the rise in the level of rivers and intensification of droughts and floods are becoming more pronounced, heaping further misery on already fragile societies livelihood. Climate variability adds a new dimension by substantially increasing the frequency and intensity of existing climatic events such as floods, droughts, and storms. Climate variability is an enormous political and economic challenge; preventing further warming entirely is impossible. Hence, today, and even in the future, communities will continue to face the consequences of a warming world and increasing climate variability, including more frequent and severe natural disasters (Das, 2018). In development circles, these shocks are increasingly seen as a significant threat to social stability in term of community's livelihood (Serdeczny *et al*., 2017).

In recent years, the relationship between livelihood, climate variability, and conflicts has been put under scientific scrutiny. The overall findings of this expanding research field are mixed, suggesting that there is no universal relationship (Loughlin *et al*., 2012), yet dismissing any connection between the three livelihoods shocks would be premature. Most studies conducted on peoples' livelihoods in different parts of South Sudan focused mainly on assessing the status of food security and livelihood at a macro level and its contribution to the welfare of the household and overlooked the disruptive effect of climate change and conflict on people's livelihoods and the livelihood built strategies at micro level. This review articles, seeks to critically assess how climate change has disturbed Livelihood and adaptation strategies to climate variability in Post Conflict South Sudan

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with the following specific objectives. 1) To review the extent to which climate variability shocks disturb communities' livelihood resilience in pre and post conflict South Sudan. 2) To review livelihood resilience adaptation strategies built by communities to absorb and recover from climate variability shocks in pre and post-conflict South Sudan and 3) To analyze policy recommendation for strengthening South Sudan community livelihood resilience from review articles.

Design: The author employed a quantitative methodological review using systematic protocol principles for searching, screening, appraising quality criteria and data extraction and analysis respectively.

Search strategy and terms: This review article is synthesized from a systematic review of the salient literature from books, journal articles, peer-reviewed publications, manuscripts, and working papers focusing on communities' adaptation strategies in enhancing livelihood resilience to climate variability shocks as well as the evolving and current usage of the livelihood resilience adaptive capacity in post-conflict South Sudan. The review focuses entirely on application areas that could be of help in understanding the livelihood and climate variability adaptation with a focused 'livelihood strategies that hence their adaptive capacity. This therefore involved casting the net as wide as possible, predominantly during internet exploration with free typescript searches on a number of databases such as *Google scholar and academic Search website* using such terms as 'resilience', 'livelihood resilience, adaptation to climate variability, 'livelihoods in conflict' and 'household livelihood resilience' and then thoroughly scanning the numerous articles available towards understanding and coming up with a clear conceptualization of livelihood resilience and adaptation to climate variability'.

Search inclusion criteria, search limits and period: In this review paper, the search limit was applied to peer-reviewed journal articles in the English language. This is because peer-reviewed journal articles provide validated knowledge and give a good estimate of accepted topics and methodologies and a total of 25 relevant studies and assessment were selected based on the number of search results. Also, the time frame chosen for the systematic review considered only those articles published between January 1, 1991, and December 31, 2016. The rationale for setting the cut-off year for this review was based on the time period were communities livelihood was disrupted by climate change during the war and after the wartime and look current built livelihood strategies to climate by communities after North and South conflict. The ûnal year of consideration, 2016, was the most current research year when this systematic review was initiated in 2017 and was thus chosen to represent the most current development. For the database Scopus, the search for the search terms was limited to subject, title, abstract and keywords of the article. The proximity operator of W/5 was included between two consecutive search terms to include results where the two search terms appear within five words.

Exclusion criteria: Journal articles were excluded if only the title was available, or the author was unable to get the full paper due to the limited accessibility and time frame. Studies that claimed to look at climate change impact on livelihoods, but did not use a resilience scale were excluded from this paper. Papers not published in English were excluded from review if no translation was readily available between two consecutive search terms to include results where the two search terms appear within five words.

Data extraction strategy and analysis: A short data extraction template was developed by the researcher to capture relevant data that will be analyzed in the review. The data extraction strategy was piloted using the 5 articles. As part of the data extraction, articles were being assessed to determine if they had included some assessment climate disruptive effect and livelihood strategies. Those that have done so were being subjected to the second phase of data extraction using a second similarly- derived template. The data extraction templates were designed so that fixed answers are selected from a coded, drop down the list and then the answers were entered into a numerical coded spreadsheet format for subsequent analysis with descriptive statistics and qualitative narrative data.

This section will provide the discussion of pre and post situation in South Sudan and the results of the three objectives of how climate variability disturbed or undermines livelihood resilience and addresses the questions on how communities adapt, absorb, and recover from climate variability shocks.

Pre- and Post-Conflict Development Situation in South Sudan: South Sudan is emerging from one of Africa's longest civil war, and millions of individuals who were refugees in neighboring countries and those who were internally exiled during the war have been returning to their home origin areas. In post-conflict situations, resources crucial for human survival and creation of viable livelihoods are severely limited or have been destroyed, making the situation very problematic for returnees and the host communities (Tizikara, *et al* 2015).

On 9 July 2011, the Republic of South Sudan became the worlds newest and Africa's 55th nation. In a January 2011 referendum on independence, 99 percent of voters in the south of Sudan had favored separation from the north. Even before independence, the authorities in the south were carried out development activities, which began after the signing of the Comprehensive Peace Agreement between the north and south in 2005. Despite some achievements, many daunting challenges remain (Tefera, 2015). This peace has brought political stability and made it

possible for many humanitarian organizations to shift their assistance to development programs and activities that encourage sustainable development by enhancing the livelihoods of the rural household.

The 21-year Sudanese civil war took an enormous human toll and left South Sudan impoverished. More than half the population lives below the international poverty line. Most of the poor are in rural areas, where 84 percent of the population lives. (The Government of South Sudan states that the total population is close to 9 million.) The relationship between the Government of South Sudan in Juba and the Government of Sudan in Khartoum remains tense due to sporadic military clashes. And several key issues – including the sharing of oil proceeds, border demarcation, cross-border trade, and citizenship – have yet to be resolved between the two states. Against this backdrop, the primary drivers of poverty in South Sudan include conflict, displacement, depletion of assets and limited access to social services. Very low-income levels and purchasing power – along with conflict-related disruptions and inadequate infrastructure – have inhibited economic activity and market development (Tefera, 2015).

Agricultural land and livestock are the most important source of livelihoods in rural areas of Southern Sudan and most rural households have few or no assets. Even for those with assets, leveraging them to participate in markets is difficult. The vast majority of the population lives in traditional, thatched-roof houses with scant access to safe water and sanitation, education or other necessities. Despite widespread poverty, South Sudan has higher per capita GDP as of 2012 than any other East African nation. It is rich in oil and natural resources, with oil exports accounting for more than 70 percent of GDP and about 90 percent of government revenue. But income inequality is high, and the country has yet to transform its natural endowments into improved infrastructure and livelihoods.

Communities Livelihood Before, During and After the 1962-2005 Civil War in South Sudan: Before the start of the first civil war in 1962 between Anya Nya movement of South and Sudan army force (SAF), Livelihood for communities was mainly based on Livestock keeping, crop farming, fishing, trade and a limited dependence on wild fruit gathering (Tizikara *et al*., 2015). However, the Second civil war of 1983 to 2005 between North Sudan and Sudanese People's Liberation Movement (SPLM) in South, under leadership of John Garang de Mabior, brought terrible devastation toll to the lives and livelihoods of the South Sudanese, during the period of civil war, communities were exposed to exogenous counter-insurgency leading to dramatically decrease and loss of communities' livelihood assets and reduction in farming and livestock rearing activities and replacing them with increased dependence on gathering wild foods. Results from the FAO database indicated during the war in South Sudan communities change the livelihood resilience strategies and engaging in numerous form of livelihood resilience strategies. Table 1 indicated communities' livelihood resilience strategies during pre, during and post war and the varying in percentage of communities' engagement due to communities' inability and ability to access livelihood resources for strengthening their resilience to conflict and climate change-related shocks.

Results from FAO also indicated that the majority (51%) of South Sudan communities stored most of their food stocks as insurance for change in weather pattern which was actually an important livelihood resilience strategy of managing climatic shocks, as they have the advantage of being fairly sold out for income, and sold to smooth consumption. However, these livelihood resilience strategies of grain stocks also make them targets and susceptible to militia attacks. Grain stocks, in particular, were susceptible to militia attacks during the civil war because they are difficult to hide or move, which also makes managing them, particularly storing them, arduous. Literature provides evidence of successful livelihood recovery since the signing of the Comprehensive Peace Agreement between the Government of Sudan and the Sudan People's Liberation

Table 1: Livelihood options before, during and after conflict in South Sudan.

Common Livelihood resilience strategies		Percentage of household engaged in livelihood resilience strategies			
		Pre-war	**During war**	**Post-conflict**	**Total**
1.	Crop farming	53	19	23	95
2.	Livestock rearing	36	17	37	90
3.	Engaging in small Business IGA	23	12	34	69
4.	Engaging Fishing	27	43	24	94
5.	Gathering of wild fruits & tree leaves	27	50	13	90
6.	Reliance on kinship and receiving help from friends	24	32	5	61
7.	Sale of non-agricultural labour	26	31	9	66
8.	Storage of food as insurance for climate change	12	51	20	63
9.	Seeking employment/wage labor	31	23	42	96
	Total	259	258	207	724

Source: Derived from (Chan, 2010) and Deng, (2010a).

Movement (South Sudan) and the South Sudan independence that happen on 9 July 2011, it is believed that livelihood recovery in South Sudan has been especially rapid in areas that have been least affected by climate variability and tribal conflict and where populations have gained greater access to arable land, infrastructure and services ((Maystadt *et al*., 2015). Some specific conditions for the increased, in trends of livelihood recovery, include stability in some parts of the country, women's participation in non-farm economic activities has increased, the family composition has helped rebuild social capital and crop production has expanded despite the climate variability shocks.

Finding from the review articles indicated that 53% of the South Sudanese populations engaged in crop farming before the civil war compared to wartime (19%) and after the war (23) respectively. The significant variation and decline from 53% to 19% and increase into 23% after is attributed to war and climate variability shocks such as flood and drought that constantly hit Greater Upper Nile and Baher el Ghazal region. It was assessed that two-thirds of the 19% population derived their livelihood during the war by engaging in limited cropping of sorghum and maize which supplement UN food aid especially in Greater Upper Nile and Baher el Ghazal region. The remaining third of the 19% population were crop farmers in the Equatoria region, which has a climate favorable for agriculture and better soils and was not severely affect by conflict. In particular, the "Green Belt" in the south of Western Equatoria, along the border with Uganda and Congo, which receive higher rainfall and has great agricultural potential; Before the War, all the major tropical crops have been grown in this zone which was late effect by conflict and influx of population from war more affected region.

Gathering of wild fruits & tree leaves was one of the important livelihood strategies during with the majority (50%) of the South Sudanese engaged in gathering wild fruit, bamboo shoots, and tree leaves during the wartime compared to 27% and 13% before and after the war crises. the variation in the harvesting of wild fruits and tree leaves is that before the war, communities were engaged in crop farming and livestock rearing, making the demand for wild fruit and tree leaves less. however during the war communities loss crop and livestock farmer making community's to restore to the collection of wild edible trees species and other forest food product as a strategy. These activities of collecting decrease after the war due to accessibility to agriculture land for cultivation and availability of other livelihood options. A study conducted by Mochizuki, (2017) indicated that most of the communities during the war were engaged in harvesting edible plants and mushrooms in the forest. Meaning that forest food was an important livelihood option to households, but the increasing trend of climate variability and wildfire have resulted in unavailability and reduced of harvesting and consumption.

Livelihoods Resilience and Climate Change Adaptation in Post Conflict South Sudan: Livelihood systems in South Sudan have experienced enormous shocks and extreme changes over the past pre-conflict period (Maystadt *et al*., 2015).Though most communities are making positive progress after signing of the Comprehensive Peace Agreement (CPA) on January 2005 between the Sudan People's Liberation Movement (SPLM) currently the Government of South Sudan and the Government of Sudan. Their recovery from multiple shocks over the past 21 years of civil conflict is not yet completed. Therefore, many still struggle to meet their needs and remain vulnerable to new climatic shocks. The impact of conflict on civilians and their livelihoods was severe, given that the military strategies and operation was increasingly targeting civilians and their assets leading to masses destruction of livelihood assets, loss of life and the destruction of vital infrastructure, displacement and immense psychological trauma. This conflict situation hampers the ability of the local agro-pastoralist population to pursue livelihoods. This was the case, for example,

Table 2: Climate change and variability disturbing impact on livelihood.

Impact of climate variability		**% estimated of losses due to climate change and variability**	
		Greater Equatoria	**Northern Baher El Ghazal**
1.	A decline in crop yield	86.3	74
2.	Crop dry up	75	81
3.	Increase in crop yield	23.8.	33
4.	Outbreak of pests and diseases	54.4	62
5.	Increase in soil erosion leading to gullies	25	52
6.	Death of livestock animals	70	89
7.	Loss of assets like collapsing houses	78.1	97
8.	Food shortage	80.63	76
9.	Decrease in water quality and quantity	76.9	81
10.	Collapse of farm structures	65.63	72
11.	Escalated food prices	63.1	84

Source: (Food and Agriculture Organization (FAO), 2009).

following the laying of landmines in the fields and roads connecting people with markets in Greater Equatoria and Upper Nile state during the conflict. Movement restrictions, due to the threat of violence or extortion, also constrain communities from adapting livelihood strategies against climatic stresses. Farmers cannot access fields, nor fishermen, laborers cannot migrate in search of work or seasonal opportunities and it was dangerous for herdsmen to move with this livestock from one place to another in search of pasture. Livelihoods were restricted to the place of residence and shift, for example, to home markets, subsistence agriculture or foraging (Maystadt *et al*., 2015).

In Bahr el Ghazal region, people changed their livelihoods strategies to reduce the chance of attack. Before the war, the Dinka economy was based on transhumant animal husbandry, agriculture, fishing, trade and some gathering of wild foods; during the war, households reduced farming and livestock-rearing activities and increased their gathering of wild foods. At a local level, armed groups or others who are able to exploit the situation often tax local traders and prey on the local population. Maystadt *et al*., (2015) report how armed groups combatants have looted harvests and set up roadblocks to facilitate extortion – and due to the threat of attack women fear going to fields5. This has had an impact on the strategies of farmers, including changing the crops that they plant and decreasing how much they invest in their land. FAO, (2015) indicates that most parts of South Sudan are between poor with low resilience considering the overall relative resilience. The most resilient livelihood areas are those in Western Equatorial state (Zone SS01), Eastern Equatoria and part of Jonglei State (Zone SS05) as in Fig 1.

This zone mainly cultivates maize and cassava, and partly groundnuts, sesame and sorghum for the livelihood. Households that depend on pastoralism in the northern part of the country (zone SS06 and SS10) have poor resilience as they have limited livelihood diversity and are often hit by seasonal drought, livestock disease, and conflict. Most of the poor households in the central parts of the country who depends on rain-fed agriculture and related activities have poor resilience due to climate variability stresses such as dry spell, floods and very low diversity of livelihoods to improved their livelihood resilience due to the frequency and intensity of extreme climatic events such as heat waves and erratic heavy rainfall, as well as the long-term chronic effects of higher temperatures are set to increase. For this reason, effective livelihood strategies and adaptation to climate variability are of essential importance to countries. For a Livelihood to be resilient to the impact of climate variability, households and communities require the skills, assets and other resources necessary to adapt to changes. The diversity, amount and balance between assets influence how community members view their own well-being and livelihood resilience and therefore the need to focus on livelihoods arises because livelihoods of the rural poor are rooted in the productivity of ecosystems that climate variability is already altering.

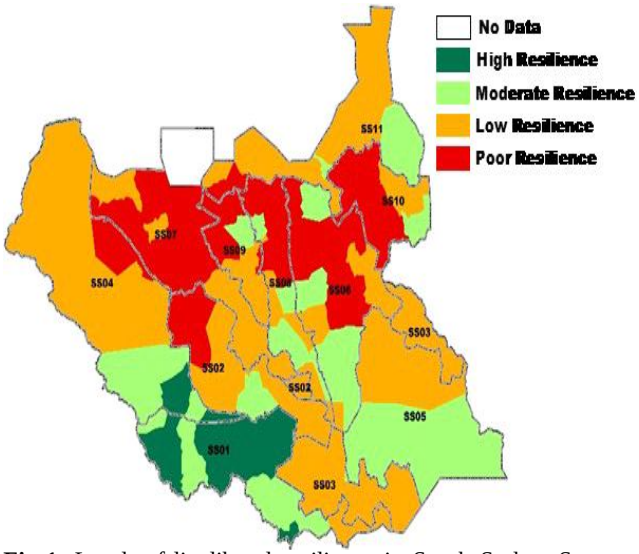

Fig 1: Levels of livelihood resilience in South Sudan. Source: FAO,(2015).

The extent to which climate variability shocks have disturbed communities' livelihood resilience in post-conflict South Sudan: Different parts of South Sudan experience serious incidents of climate variability shocks such as flood and drought that caused major disturbances, destruction of property and loss of lives and livelihood assets such as livestock. Relevant review literature, identify various climate variability stresses in that disturb and interrupt communities' livelihood resilience system, in particular, those who depend on natural resources that are sensitive to climate variability related stresses. The FAO assessment indicated that the majority (86.3%) of communities surveyed in greater equator and 74% in greater Behr El Ghazal noted the decline in crop yield due to the disruptive impact of climate variability. while Seventy-five percent (75%) in greater and 81% of the surveyed household by FAO also argued that climate variability has resulted in crop dry up in many forms during 2012 and 2013.

Also, because of the disruptive impact of climate fifty-four-point four percent (54.4 %) and Sixty two percent in both greater Equatoria and greater Baher El Ghazal revealed that there was an increased incidence of pests and diseases for both the livestock and crops in the area over the past 5-10 years, and they attributed this to climate variability while 51% and 25% of FAO surveyed in the two regions noted the effects of climate variability in the form of increasing soil erosion that late lead to gullies as showed in Table 2 below. All these climate variability impacts have disturbed the livelihood resilience of the communities in South Sudan despite data from two regions.

During the long rainy season (April-September season), the above normal rains received in various parts of

the country translated into flooding that impacted on nearly all sectors. Flooding occurs as a result of a surge in water caused by high (upstream) rainfall that breached major river banks in the flood-prone areas of the country. The amount of runoff usually exceeded the normal capacity of underground drainage systems and caused them to overflow.

Generally, the vulnerability to flooding and severe impacts is gravely due to settlement in floodplains. Many communities do farm along slopes adjacent to the flood-plains, causing massive destruction of crops and erosion in the catchments. Reduction in the capacity of the soil to absorb water is reduced due to erosion leading to poor underground water available for the crop during a dry spell. Before the pre-conflict situation in South Sudan largely count on their kinship networks, mutual aid, self-help groups and indige-nous organizations secure help and support (Malual, 2008). However, as the frequency and severity of covariate shocks such as flooding increases compounded by 21 years of conflict, the role of social networks begins to wane. This process came out in FAO, 2014 report where participants mentioned that the severity of flooding in recent years is the main obstacle for relying less on kinship networks and neighbors.

According Lokosang *et al*., (2016) the most climate variability stressors effect livelihood resilience of the communities in South Sudan typical include, floods, riverbank erosion, and drought, dry spell, heavy rain and storm, these climate variability stresses have resulted into livelihood instability of communities especially those along River Nile and Sudd swampy. The Sudd is a vast expanse of swampy lowland region in central South Sudan have the largest swampy in the world called the Sudd swampy means that an immense number of rivers flow through the country. These rivers and swampy provide livelihood options for the communities, but they simultaneously stress people's livelihood systems and assets. Land loss, through riverbank erosion, is common more particularly in Great Upper Nile. These swampy coastal villages move with the erosion as people follow the swampy bank. Several communities and household along sudd swampy and river Nile every year lost, rebuilt, and again lost, two or sometimes three houses into the river Nile and sudd swampy as it flooded out. Number of the household are forced to sell the few cattle/cows that remained to enable a shift in livelihoods. For example, selling cow and goats for money to purchase fishing nets or a fishing boat is the common livelihood strategies to build resilience against floods.

According to Integrated Food Security Phase classification report (FAO, 2014), many parts of South Sudan such as greater upper Nile and Unity state, farmland gets flooded every year during the rainy season which farming communities suffer crop losses when the floods arrive earlier than usual. Farmers in Jonglei state cannot farm during the rainy season because of the annual floods. Many of them tent pursue alternative livelihoods options such as rearing livestock and often results in yearly livestock seasonal migration.

In Eastern Equatorial, South Sudan, drought, and dry spells create difficulties for farmers and put pressure on communities' livelihoods: Hot sun radiation waves can destroy the crops. Due to the hot sun radiation wave the Maize burns out and ends up without corn in it. When the crops start to shrink and it does not get water, the crop will die. Dug water, wells are not affordable to all the household in South Sudan, especially in the rural area even those people who have well only use the water for domestic users and for irrigating their own land. For the pastoralist in South Sudan, migration is a common seasonal livelihood adaptation strategy in dealing with changes in rainfall patterns, dry spells, and drought respectively (Oxfam GB, 2013).

Livelihood Resilience Adaptation Strategies Built by Communities in post conflict south Sudan: In the light of a projected long-term increase in climate variability stresses such as floods and droughts, animal diseases compounded by other stresses such as conflicts and land degradation, livelihood adaptation strategies are becoming ever more necessary to household resilience. Adaptation to climate variability shocks by communities in South Sudan is a major challenge towards livelihood resilience and development, which is considered in the context of wider development pressures, which includes poverty and sustainable management of Natural resource (Zetter & Blitz, 2014). Review results indicate that communities in South Sudan have adopted various livelihood adaptation mechanisms that range from traditional strategies to modern adaptation strategies to deal with the devastating effects of climate variability on their livelihood activities so as to build resilience livelihood. Some of this climate variability livelihood strategies include livelihood diversification strategies, such as asset portfolio management and livelihood activities include the diversification of assets, the holding of stock and investment in social, physical and human capital, while shocks insurance includes collection and consumption of wild fruit and root, dowry from marriage and other family and community arrangements as shown in Table 2.

In South Sudan tribe like Dinka from greater Upper Nile and Baher el Ghazal region of South Sudan diversify their crop production activities to deal with the effects of climate variability stresses, this diversification includes crops and livestock diversification (planting different crops and intercropping), spatial diversification (planting in different fields), temporal diversification (staggered plantings) and varietal diversification (e.g. use of drought-resistant varieties, this livelihood strategy has significantly increased the livelihood resilience and rebuild of livelihood assets of the communities since the signing of CPA that ended 21 years

Table 3: Livelihood resilience adaptation strategies built by communities.

Livelihood resilience adaptation strategies	Greater Equatoria	Greater Bher El Ghazal
1. Livelihood diversification by farmers/Off-farm	42	37
2. Involved in Saving and Credit livelihood activities (VSLA)	36	27
	36	
3. Fishing for food and Cash	23	45
4. Rain harvesting/solving water problem	21	17
5. livestock rearing	17	32
6. Drought stress tolerant improved varieties	21	10
7. Changing the timing of planting	34	21
8. Temporal migration	9	23
9. Reducing food consumption	22	23
10. Using moisture stress tolerant crop varieties	15	7
11. Tradition micro-irrigation schemes	32	23
12. Relying on family and friends	20	34
13. Brewery	42	24

Source: Data computed from Mochizuki, (2017) and (Deng, 2010).

of civil war. This review results agree with L. B. Lokosang *et al*., (2014) which say that, since the end of the conflict, rural and urban households in South Sudan have started employing various livelihood adaptation strategies in response to climate variability-induced challenges.

In the same vein, households often switch to cultivating drought-tolerant crops in coping with drought and erratic rainfall especially in all the state of South Sudan, for example farmers in Dinka community in Jonglei state employed variety of livelihood strategies to deal with climate variability stresses such as dry spell, drought and floods. These include switching to alternative livelihoods, micro-irrigation along the River Nile and Sudd swampy, and switching from maize cultivation to sorghum, a more drought-resistant crop. Thus, Deng, (2011) in a study of livelihood adaptation strategies, observed that farming communities' main livelihood resilience adaptation practice entailed switching to more drought-tolerant crops, such as millet, and to different varieties of the same crop, such as more drought-tolerant maize, changing cropping dates, increasing micro-irrigation, constructing harvesting water facilities, planting and retaining trees on farms and around homes, selling livestock, post-harvest technology and livelihood diversification which allows households to access other sources of income when production is insufficient to feed family members .

Furthermore, Malual,(2008) indicated that traditional livelihood adaptation and coping strategies such as collection and consumption of wild fruit and root are sufficient to deal with the new challenges brought about by abrupt drought and dry spell. Other unsustainable livelihood adaptation strategies used by households in many parts of South Sudan included charcoal burning, hunting, rely on less preferred and less expensive foods, relying on family and friends borrow food or rely on help from a friend or relative, purchase food on credit, gather wild food, consume seed stock held for next season, send household members to eat somewhere else, skip whole day without eating, reduced frequency of meals eaten per day, migration for labor, slau- ghter of livestock. However, despite widespread adoption of livelihood resilience strategies at the community level, the evidence shows that people do not always respond in the same manner to similar climate variability shocks and often vary, even in the same geographic location and county (Deng, 2011).

Generally, it can be argued that those households with economic capital in the form of livestock and credit are in a better position to withstand and recover from the effects of climate variability as such assets contribute to their resilience through creating more opportunities for livelihood diversification that enable households to manage and cope with flooding in more sustainable ways while among those not having access to credit and economic assets, their resilience level is found to be very low.

Policy Recommendations: From the review literature results, different study has suggested some of the appropriate context-specific recommendations for strengthening and ensure the community's livelihood resilience in a post-conflict South Sudan, the researchers recommend the following to both government and Non-governmental organization who are working on helping communities build their livelihood assets that were affected by conflict and the ongoing climate variability as followed.

1. Local traditional knowledge is also vital in identifying appropriate adaptation actions. This includes traditional practices as well as autonomous local responses to climate variability impacts, such as farmers' own efforts to diversify their crops. It is also significant to understand the viewpoints of different sections of communities, including poor and marginalized people whose voices may not normally be heard and therefore efforts, should be made to offer financial and information assistance to help communities and individuals

develop their livelihood assets and build resilience early enough and in preparation for any future climate variability shocks but not just in response to expected shock.

2. Livelihood diversification is key in improving livelihood resilience and adapting to climate variability shocks and therefore, the government of South Sudan together with-it development partners such as non-governmental organizations (NGOs) as well as external funders should prioritize programmes that ensure livelihood diversification of communities. Off-farm incomes, for example, can give agri- cultural communities more options and reduce their vulne rability.

3. Building social assets and strong community solidarity which plays critical advantages in responding to climate variability shocks, allowing experimentation, asserting common approaches, and allowing people to jointly advocate for stronger rights and development support in an effort to ensure their livelihood resilience to climate variability. Therefore, it is important to continue to strengthen local institutions, individually and collectively that was interrupted by conflict so that they can better engage in adaptation planning and decision-making and increase local influence in government processes. Provision of communities' access to land, finance/credit, agricultural inputs, and technologies need to require critical consideration of equity, given that the individual whose livelihoods activities are most affected are also those who typically have the least political, social and economic ability. This equity consideration should cover not only the poor and marginalized social groups of individuals, but also women who contributed 80% of the household food.

CONCLUSION

Livelihoods activities in South Sudan are increasingly trapped amid both climate variability shocks and conflict. The devastating impact of climate variability shocks such as floods, drought, dry spell, heavy rain, waterlogging, River Nile-level rise, land loss, and swampy bank erosion all falls excessively on the livelihood of the poorest South Sudan population, undermining their abilities to build resilience livelihoods. Among the most vulnerable people in South Sudan are those depending on livelihood assets which sensitive to climate variability. Livelihood adaptation strategies, such as Switching to alternative livelihoods, collection, and consumption of wild fruit and roots, modifying agricultural practices, livelihood diversification, and migration, can be ways to enhance livelihood resilience.

This review article argues the need for government and Non-governmental effort in protecting vulnerable communities against future climate variability impacts using a people-center approach that looks on how communities' livelihood resilience can be strengthened. Understanding the livelihood resilience strategies of poor people in the context of wider social, environmental, economic as well as political shifts must now be seen as a priority. Even incremental improvements in livelihoods resilience of the citizens and the provision of livelihood adaptation strategies and practices can have sustainable livelihood resilience benefits for future generations. A livelihood resilience approach assistances to increase these efforts beyond such technical attitudes to minimizing harm and loss by bringing issues of people's lives, property rights, rule of law, and accountability to the fore. In doing so, it demands greater attention to the societal root causes underlying differences in vulnerability and resilience to climate change.

To conclude, the recent 2017 UN Climate Change agreement, COP 23rd held in Bonn, Germany, set climate Variability stressors mitigation and adaptation goal in the light of new scientific and policy attention to the continuing global climate change and variability during the past decades. Simultaneously, I hope the UNFCCC COP 24 to be held Katowice, Poland from 3-14 December, 2018 will see the negotiation of a new UNFCCC climate treaty to supplant the Paris climate change agreement and development of a revised framework for Action that will in cooperate the policy strategy for building Livelihood resilience in the façade of climate variability so as to have an action around a common objective of global strategies to tackle poverty eradication and adverse effect of climate change.

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